

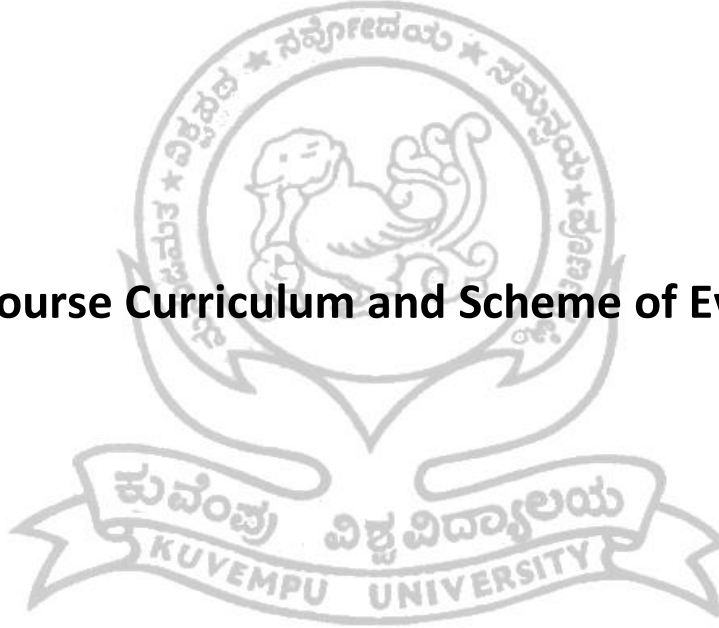


KUVEMPU

UNIVERSITY

B.Sc., BOTANY PROGRAMME

Course Curriculum and Scheme of Evaluation



B.Sc., BOTANY
FIRST SEMESTER
Paper I (SSA 790) Q.P. Code - 15130

VIRUSES, BACTERIA, CYANOBACTERIA, ALGAE, FUNGI AND LICHENS

Syllabus

Theory	
Total theory marks	-50
I A marks for theory	- 10
Total number of teaching hours / sem	- 60hr
Total number of teaching hours / week	- 04hr
Duration of theory exam	-03hr
Practical- Based on theory paper I	
Max. marks	-40
Total number practical / week	-01
Duration	-03hr
Duration of practical exam	-03hr

Viruses ; Ultrastructure of TMV and T-4 Bacteriophage, Multiplication of Viruses, Common viral diseases of plants – Tobacco mosaic diseases. Bean mosaic disease and Leaf curl of Tomato.

Mycoplasma ; Structure and grassy shoot disease of sugarcane.

Bacteria; Introduction, Morphological types, flagellation, ultra structure, nutrition, reproduction – cell division, conjugation, transduction and transformation, Economic importance and diseases – Citrus canker, Late blight of paddy, Red stripe of sugarcane and Angular leaf spot of Cotton.

Cyanobacteria; Occurrence, Structure, reproduction and economic importance,(Biofertilizer, food, eutrophication and algal blooms) of cyanobacteria.

Type study–*Nostoc* and *Spirulina*.

-16hr

Algae – General characters, Classification based on Chapman and Chapman system and economic importance.

Occurrence, structure of thallus, Reproduction and life cycle of the following.

Chlorophyceae- *Volvox, Spirogyra, Oedogonium, Chara*

Xanthophyceae-*Vaucheria*

Phaeophyceae – *Sargassum*

Rhodophyceae – *Batrachospermum*

- 22hr

Fungi - General characters, Classification based on major classes based on Alexopoulos system and economic importance of fungi.

Structure, nutrition, reproduction, lifecycle, disease symptoms and controlling methods of the following.

Oomyctes- *Phytophthora, Albugo.*

Zygomycetes- *Rhizopus*

Ascomycetes- *Penicillium, Xylaria*

Basidiomycetes – *Puccinia graminis-tritici*

Deuteromycetes – *Cercospora*

Lichens – Occurrence and classification-Crustose, foliose, and fruticose. Structure : external and internal, reproduction and economic importance of Lichens.

-

-22hr

B.Sc. Botany

FIRST SEMESTER

Practical -I model question paper

Duration of practical examination: 3 hrs

Max.Marks-40

(VIRUSES, BACTERIA, CYANOBACTERIA, ALGAE, FUNGI AND LICHENS.)

Q-I. Identify the specimens A, B & C sketch, label and give reasons. -09

Q-II. Write critical notes D & E, (Macroscopic) -05

Q-III. Write pathological aspects of F, G & H -06

Q-IV. Identify the slides I, J, K & L with reasons -10

Record -05

Viva -05

SCHEME OF EVALUATION FOR BOTANY PRACTICAL-I

First semester Practical-I

Time:03 hours

Max.Marks-40

(VIRUSES, BACTERIA, CYANOBACTERIA, ALGAE, FUNGI AND LICHENS.)

- | | | |
|------|---|------|
| I. | Identify the specimens A, B & C
Identification =01
Sketch & label =1 ½ marks
Reasons =1/2 marks
(Algae-01, Fungi-01 and Lichens-01.) | -09 |
| II. | Critical notes on D & E (Macroscopic)
Identification =01
Critical notes=1 ½
(Algae-01, Fungi-01) | - 05 |
| III. | Identify and comments on F,G& H
Hological specimen Bacteria, Virus, Fungi
Identification -01
Symptoms & control aspect =01 | - 06 |
| IV. | Identify the slides I, J, K & L with reasons
Identification =01
Reasons=1 ½ marks
(One from Bacteria, / one from Cyanobacteria/ Lichens, one from Fungi, one from algae)
Record-05
Viva-05 | - 10 |

**B.Sc BOTANY
SECOND SEMESTER
Paper II (SSB 790) Q.P. Code – 15230.**

BRYOPHYTA, PTERIDOPHYTA, PALAEOBOTANY AND GYMNOSPERMS

Syllabus

Theory	
Total theory marks	-50
I A marks for theory	- 10
Total number of teaching hours / sem	- 60hr
Total number of teaching hours / week	- 04hr
Duration of theory exam	-03hr
Practical- Based on theory paper II	
Max. marks	-40
Total number practical / week	-01
Duration	-03hr
Duration of practical exam	-03hr

Bryophyta – Introduction, General characters, alternation of generation, classification. Structure: external and internal and reproduction of the following examples.

Hepaticopsida– Riccia and Porella

Anthocerotopsida – Anthoceros

Bryopsida – Polytrichum

Brief account of evolution of sporophytes and economic importance of Bryophytes. - **15hr**

Pteridophyta– Introduction, classification, occurrence, morphology, anatomy, reproduction and life cycle of the following examples.

Psilopsida – *Psilotum*

Lycopsidea– *Lycopodiumcernnum* ,*Selaginella*.

Sphenopsida – *Equisetum*

Pteropsida – *Marselia*

Brief account on stellar evolution, Heterospory and seed habit, economic importance of Pteridophytes. **- 25hr**

Palaeobotany – Introduction, process of fossilization, types of fossils, geological time scale, a brief account of **Rhynia and Lepidodendron stem**. **- 05hr**

Gymnosperms - General characters, affinities of gymnosperms, classification, morphology, anatomy of root, stem and leaf. Reproduction and life cycle of
Cycadopsida -*Cycas*,
Coniferopsida -*Pinus*
Gnetopsida - *Gnetum*.

Economic importance of Gymnosperms -

15hr

[Developmental aspects need not to be studied]

B.Sc. Botany

SECOND SEMESTER

Model question paper

(BRYOPHYTA, PTERIDOPHYTA, PALEOBOTANY AND GYMNOSPERMS)

Time :03hrs

Max.Marks-40

- | | |
|--|-----|
| Q-I. Identify the specimens A, B&C sketch, label and give reasons. | -09 |
| Q-II. Write critical notes D &E, | -06 |
| Q-III. Identify the slides F, G, H, I, & J with reasons | -10 |
| Q-IV. Prepare temporary staining mount of 'K' Identify, sketch, and label leave it for observation | -05 |
| Record- | 05 |
| Viva- | 05 |

SCHEME OF EVALUATION FOR BOTANY PRACTICAL-II

(BROYOPHYTA, PTERIDOPHYTA, PALEOBOTANY AND GYMNOSPERMS)

Time:03 hours

Max.Marks-40

Q-I. Identify the specimens A, B & C -09

Identification =01

Sketch & label =1

Reasons =1

(One from Broyophyta, One from Pteridophyta, and One from Gymnosperms)

Q-II. Critical notes on D & E (Macroscopic) - 06

Identification =01

Critical notes= 02

(One from Broyophyta, /Gymnosperms & One from Pteridophyta,)

Q-III. Identify the slides, F, G, H, I, & J with reasons -10

Identification =01

Reasons =1

(One from Broyophyta, One from Paleobotany, Two from Pteridophyta, and One from Gymnosperms)

Q-V. Prepare temporary stained mount of 'K' sketch, label and identify leave the preparation for inspection. (Pteridophyte or Gymnosperms) 05

Preparation=02

Identification=01

Sketch label=02

Record -05

Viva-voce -05

**B.Sc BOTANY
THIRD SEMESTER
Paper III. (SSC 790) Q.P Code 15330.**

HISTOLOGY, ANATOMY, EMBRYOLOGY AND PALYNOLOGY

Theory	
Total theory marks	-50
I A marks for theory	- 10
Total number of teaching hours / sem	- 60hr
Total number of teaching hours / week	- 04hr
Duration of theory exam	-03hr
Practical- Based on theory paper III	
Max. marks	-40
Total number practical / week	-01
Duration	-03hr
Duration of practical exam	-03hr

Histology: Meristems – Structure and function, Classification based on Origin, function and position. Histogen and Tunica corpus theory. Structure and function of parenchyma, Collenchyma, Sclerenchyma, Xylem and Phloem. **-07hr**

Tissue system:

Dermal–Structure and function of epidermis, Stomata, hairs and glandular hairs **-02hr**

Ground tissue system - Structure and function of Cortex, Endodermis, Pericycle and Pith **-03hr**

Vascular tissue system – Types of vascular bundles- Radial, Conjoint, Collateral, Bicollateral, and concentric. **-02hr**

Anatomy: - Internal structure of

Dicot - Tridax and Cucurbita stem, Cicer root and Tridax leaf.

Monocot –Grass stem, Canna root and Grass leaf.

Normal secondary growth- in Tridax stem. Formation of cambial ring, Storied and non-storied cambium, activity of cambium, secondary xylem, **secondary** phloem, vascular rays, sap wood, heart wood, growth rings, tyloses and periderm . **-10hr**

Secondary growth in typical dicot root –Cicer.

Anamolous secondary growth in Boerhavia and Dracena stem. **-06hr**

Embryology: Historical account, contribution of Maheshwari and BGL Swamy -02hr

Microsporogenesis – Development of Anther, male gametophyte and Pollen embryo sac. -03hr

Megasporogenesis – Types of ovules, differentiation of archesporial initial, formation of megaspore, types of tetrads, types of embryosac [Monosporic, Bisporic and Tetrasporic]. Development of monosporic embryosac [Polygonum type only]. Double fertilization, Triple fusion and its significance. -06hr

Endosperm: Types- Cellular, Helobial and free nuclear . Detailed study of cellular type of endosperm, endosperm haustorium and vermiform appendage. -04hr

Embryo: Types – Dicot and Monocot, development of dicot embryo Crucifer type. Suspensor haustorium,[definitionwithexample]. -02hr

Apomixis - a brief account -02hr

Polyembryony – Types, causes of poly embryony. Significance - 02hr

Palynology – Definition pollen morphology –Pollen structure, size and shape of pollen grains, spherical, sub-porate, prolate and perprolate, Wall layers and their morphology ,exine, sexine, ecto and endoexine, Nexine- I, II, and II., Pollen kit, Number, position and character of aperture and Exine sculpture. -06hr

Pollination: Types – Self and cross pollination, types of cross pollination, piston and lever mechanism, Contrivances of cross pollination. -03hr

B.Sc. Botany

THIRD SEMESTER

Practical Model question paper

(HISTOLOGY, ANATOMY, EMBRYOLOGY, AND PALYNOLOGY)

Time:03 hours

Max.Marks-40

- | | | |
|------|---|------|
| I. | Identify the specimen – ‘A’ | -03 |
| II. | Mount and sketch of Endosperm/Embryo/Pollinia of - ‘B’ | -05 |
| III. | Calculate of the percentage of viability/Fertility of - ‘C’ | -04 |
| IV. | Preparation of temporary stained slide of – ‘D’ | -06 |
| V. | Identify the slides E, F,G & H | - 12 |
| | Record- | -05 |
| | Viva- | -05 |

SCHEME OF EVALUATION FOR BOTANY PRACTICAL-III

(HISTOLOGY, ANATOMY, EMBRYOLOGY, AND PALYNOLOGY)

- | | | |
|------|---|-----|
| I. | Mount, identify, sketch, and label the specimen 'A' | -03 |
| | From palynology | |
| | Identification =01 | |
| | Sketch and label=01 | |
| | Mounting=01 | |
| II. | Mount and sketch the Endosperm/Embryo/Pollinia of 'B' | -05 |
| | Mount=03 | |
| | Identification =01 | |
| | Sketch and label=01 | |
| III. | Calculate the percentage of viability/Fertility of 'C' | -04 |
| | Preparation=02 | |
| | Calculation=02 | |
| IV. | Preparation of temporary stained slide 'D' sketch, label, & identify with reason
(Anatomy) -06 | |
| | Preparation=03 | |
| | Sketch & Label=01 | |
| | Identification=01 | |
| | Reason=01 | |
| V. | Identify the slides E, F, G, & H with reasons | -12 |
| | Identification=01 | |
| | Sketch & label=01 | |
| | Reason=01 | |

(One from Histology, one from Anatomy, one from Embryology ,and one from Palynology)

**B.Sc BOTANY
FOURTH SEMESTER
Paper IV. (SSD 790) Q.P Code 15430.**

ECOLOGY, ENVIRONMENTAL BIOLOGY AND PHYTOGEOGRAPHY

Theory	
Total theory marks	-50
I A marks for theory	- 10
Total number of teaching hours / sem	- 60hr
Total number of teaching hours / week	- 04hr
Duration of theory exam	-03hr
Practical- Based on theory paper IV	
Max. marks	-40
Total number practical / week	-01
Duration	-03hr
Duration of practical exam	-03hr

Theory:

Ecology: Definition and Scope, Factors affecting plant growth and their distribution, Climatic factors (light, temperature, rainfall, wind & atmospheric humidity), Edaphic factors (Soil formation, soil profile, soil air and soil biota), Biotic factors & Topographic factors.

Response of Plants to stress conditions- Hydrophytes, Mesophytes, Xerophytes, Epiphytes, Halophytes, Psamophytes and Parasites.
- **-15hrs**

Ecosystem: Biosphere, concept and structure of ecosystem. Types of ecosystem (pond, forest and grassland), Ecological pyramids, Ecological niche, Food chain, Food web, Ecotone, tropic level, energy flow, Law of thermodynamics and Biogeochemical cycles (Nitrogen, Hydrologic, Carbon, Sulphur and Phosphorous cycles). **-14hrs**

Ecological Successions: Process of plant succession, Hydrosere and Xerosere, concept of climax vegetation. **- 02 hrs**

Community Ecology: Methods of studying natural vegetation Qualitative and Quantitative techniques (Quadrats, Bisects and Transects). **-02hrs**

Environmental Biology

Natural Resources: Introduction, renewable and non-renewable resources, a study on fuel and soil resources, general account on NTFPs. **-05hrs**

Environmental Pollution: Source of air, water, land and noise pollution, Causes & effects of air, water, land and noise pollution (Global warming, Acid rain, Smog & fog, Eutrophication, Ozone depletion, Green house effect, Acidification, Solid wastes, Nuclear hazards) and Control/management of pollution. **-06hrs**

Forestry: Deforestations, Reforestations, Afforestations and Social forestry, importance of forestry **-02hrs**

Conservation Ecology: Soil erosions and its types, control of soil erosions, conservation and management of soil erosions. Wet lands, Sacred Grooves, National parks, Wildlife Sanctuaries and Biosphere reserves, Biodiversity Hot spots of India. **-06hrs**

Phytogeography: Phytogeographical regions of India, Types of forest in India and Karnataka, endemism. **04hrs**

Population ecology: Effect of habitat characteristics of populations, population density, mortality, natality, and populations interactions. **02 hrs**

B. Sc. Botany

FOURTH SEMESTER

PRACTICAL MODEL QUESTION PAPER PRACTICAL-IV

Practical-IV: ECOLOGY, ENVIRONMENTAL BIOLOGY AND PHYTOGEOGRAPHY

Practical Model Question paper

Time: 03 hours

Max. Marks 40

1. Mount the anatomical section of the material 'A' 06 Marks
2. Comment on the specimens 'B' and 'C' 06 Marks
3. Comment on ecological Instrument 'D' 04 Marks
4. Identify the slides 'E' & 'F' with proper ecological reasons 04 Marks
5. Determination of Soil P^H **OR** Water holding capacity of soil **OR** Estimation of Chloride in given water samples. 06 Marks
6. Mapping of vegetation of Karnataka, Marking and labelling and comment
- 04 Marks
7. Viva 05 Marks
8. Class Records 05 Marks

SCHEME OF EVALUATION FOR BOTANY PRACTICAL-IV

Practical-IV: ECOLOGY, ENVIRONMENTAL BIOLOGY AND PHYTOGEOGRAPHY

1. Identification of 'A' Hydrophytes/ Xerophytes/Epiphytes 06 Marks
Preparation: 03 Marks
Identification & reason: 02 Marks
Sketch & Label: 01 Marks
2. Comment on the specimens B and C 06 Marks
Identification: 01 Marks
Comments: 02 Marks
(Hydrophytes/Xerophytes/ Epiphytes/Halophytes/ parasite/Psamophytes)
3. Comment on ecological Instrument 'D' 04 Marks
Identification: 01 Marks
Comments: 02 Marks
Uses: 01
4. Identify the slides E & F with proper ecological reasons 04 Marks
Identification: 01 Marks
Comments: 01 Marks
5. Determination of Soil P^H **OR** Water holding capacity of soil **OR** Estimation of Chloride of given water samples. 06 Marks
Procedure : 02
Readings: 02
Results : 02
6. Mapping of vegetation of Karnataka ,Marking ,labeling and comment- 04 Marks (1+1+2)
7. Viva 05 Marks
8. Class Records 05 Marks

B.Sc BOTANY
FIFTH SEMESTER
Paper V. (SSE 790) Q.P Code 15549.

MORPHOLOGY, TAXONOMY, ECONOMIC BOTANY AND ETHNO BOTANY

Theory	
Total theory marks	-50
I A marks for theory	- 10
Total number of teaching hours / sem	- 45hr
Total number of teaching hours / week	- 03hr
Duration of theory exam	-03hr
Practical- Based on theory paper V	
Max. marks	-40
Total number practical / week	-01
Duration	-03hr
Duration of practical exam	-03hr

MORPHOLOGY: Vegetative Morphology

Root: General introduction including classification. Modification for storage (fusiform, conical, napiform and fasciculate), support (epiphytic and aerial) and respiration (respiratory/pneumatophores) floating and sucking (haustoria).

Stem: General introduction including branching type. Modification:-Rhizome, stem tuber, bulb, corm, stolon, sucker, off-set, phylloclade, cladode, thorn and tendril.

Leaf: General introduction, Types (simple and compound), Phyllotaxy (alternate, opposite and whorled) stipules.

Modification: phyllode, spines, tendril, hooks, Insectivorous plant-pitcher plant, sundew plant .

Floral Morphology:

Inflorescence- general account of racemose and cymose including special cymes.

Flower: Complete account of floral morphology - Gamosepalous, polysepalous, gamopetalous, polypetalous condition, aestivation, attachment and dehiscence and cohesion of anthers, apocarpous and syncarpous, placentation, style and stigma, floral formula and floral diagram.

Fruit: General account including classification and types of fruits. **-15hr**

TAXONOMY OF ANGIOSPERMS:

Principles of classification, Binomial nomenclature, species concept, system of classification by Bentham and Hooker, Herbarium techniques and importance of herbaria of India.

Study of following families with plants of economic importance (Bentham and Hooker's system to be followed).

Dicots: Annonaceae, Brassicaceae, Capraoidaceae, Malvaceae, Rutaceae, Anacardiaceae, Fabaceae (Caesalpinioideae, Mimosoideae and Papilionoidae), Myrtaceae, Cucurbitaceae, Apiaceae, Rubiaceae, Asteraceae, Apocynaceae, Asclepiadaceae, Convolvulaceae, Solanaceae, Acanthaceae, Lamiaceae, Verbinaceae, Amaranthaceae and Euphorbiaceae.

Monocots: Orchidaceae, Liliaceae, Arecaceae, Poaceae, and Cannaceae. **- 22hr**

ECONOMOIC BOTANY:

Food: Cereals, Millets and Pulses: Jowar, Ragi, Wheat, Rice, Black gram and Bengal gram.

Oils and Fats: Groundnut, Coconut, Sunflower.

Beverages: Tea, Coffee and Cocoa.

Textile Fibres: Cotton and Coir.

Spices: Cardamom, Clove, and Cinnamon.

Timber: Teak, Rosewood, and Neem.

Narcotic: Tobacco and Opium.

Medicinal plants: *Rauwolfia serpentina*, *Vincarosea*, *Tylophoraasthimatica*, *Cinchona officinalis*, *Withaniasomnifera*, *Tinosporacordilofia*, *Ocimum*, Garlic, *Aloe vera*, Turmeric and Ginger. **-10hr**

ETHNOBOTANY:

A general account of Ethnobotany and its significance.

Contributions of Indian ethnobotanists: S K Jain, R. R. Rao, K.S Manilal, and R. K Arora. -
- 03hr

B. Sc. Botany

FIFTH SEMESTER

MODEL PRACTICAL QUESTION PAPER PRACTICAL-V

(MORPHOLOGY, TAXONOMY, ECONOMIC BOTANY AND ETHNOBOTANY)

Time- 3 hrs

Marks - 40

- | | | |
|------|--|------|
| I. | Identify the families , A,B,C,D with reasons | - 12 |
| II. | Describe 'E' technical terms and draw floral diagram with floral formula F | - 06 |
| III. | Write the morphological and Biological importance of G,H & I | -06 |
| IV. | Write the economic importance of J & K | - 04 |
| V. | Identify and comment on Ethnobotanist L | - 02 |
| VI. | Viva | - 05 |
| VII. | Record | - 05 |

PAPER V- PRACTICAL SYLLABUS
MORPHOLOGY, TAXONOMY , ECONOMIC BOTANY & ETHNOBOTANY

MORPHOLOGY

1. Root modification -
Tap root - Fusiform , Napiform and Conical root.
2. Stem Modification -
Underground - Rhizome , Tubers , Bulb, and Corm.
3. Leaf modification -
Tendrils [Gloriosa /Pea] and Stipules [Smilax] and available insectivorous plant specimens.
4. Inflorescence - Types of Racemose (Simple raceme, Spike, Spadix ,Corymb, Head , Globose head and Umbel) , Cymose inflorescence (Simple, Dichacial , Polychacial) and Special type (Cyathium, and Verticelaster)
5. Fruits - Legume, Siliqua, Berry, drupe, Pepo, Hesperidium, Pome, Eterio of berries / Follicle.

TAXONOMY

1. Any six families from Polypetalae, six from gamopetalae and two families from each Monocots and monochlamydae. Inflorescence/ Root/stem/leaf/parts used.
2. **Demonstration of herbarium techniques.**
3. Botanical tour is compulsory
4. **Herbarium submission is deleted from the practical syllabus**
5. **ECONOMIC BOTANY**-As prescribed by the Economic Botany syllabus
6. **ETHNOBOTANY**- as per theory syllabus

SCHEME OF EVALUATION FOR BOTANY PRACTICAL-V

MORPHOLOGY, TAXONOMY, ECONOMIC BOTANY & ETHNOBOTANY

- | | | |
|------|---|-----|
| I. | Identify the families A,B,C,D with reasons
Three from polypetale and gamopetale, one from monochlamydeae/monocot
Identification =01
Salient features=02 | -12 |
| II. | Describe 'E' technical terms and draw floral diagram with floral formula F
E-Technical description = 03 marks
F- Floral diagram and floral formula= 2+1 marks | -06 |
| III. | Write the morphological and Biological importance of G,H & I

G= Root/Stem/Leaf modification
H=Inflorescene
I=Fruit
(Identification-01 marks , comments-01marks) | -06 |
| IV. | Write the economic importance of J & K
J = 02 marks, K= 02 marks
Monocot and Dicot: botanical name, family, parts used and uses | -04 |
| V. | Identify and comment on Ethnobotanist L
Identification=01 comment=01 | -02 |
| VI. | Viva | 05 |
| VII. | Record | 05 |

B.Sc BOTANY

FIFTH SEMESTER

Paper VI. (SSE 791) Q.P Code 15550.

CELL BIOLOGY AND CYTOGENETICS

Theory	
Total theory marks	-50
I A marks for theory	- 10
Total number of teaching hours / sem	- 45hr
Total number of teaching hours / week	- 03hr
Duration of theory exam	-03hr
Practical- Based on theory paper VI	
Max. marks	-40
Total number practical / week	-01
Duration	-03hr
Duration of practical exam	-03hr

The Cell: Ultra structure of a plant cell, organization, function and its components- cell wall, membranes (fluid mosaic model) Endoplasmic reticulum, Golgi apparatus, Lysosomes, Peroxisomes, Ribosomes, Mitochondria, Plastids, Cytoplasm, Vacuole, Cell sap, Non-living, inclusions, Nucleus, Nucleoplasm, Nuclear membrane, Pores and Nucleolus.

Chromosomes: Size, number, structure, chromatids, centromere, telomere, satellite, secondary constriction. Nuclear organizer. Types of chromosomes (based on position of centromere), Karyotype, heterochromatin (facultative and constitutive heterochromatin). Euchromatin, Chromosomal Model including nucleosome model; Mitosis and Meiosis in plants Chromosomal aberrations (deletion, duplication, inversion, translocations).

Variation in chromosome number: Polyploidy (Anueploidy, euploidy, autopolyploidy, allopolyploidy- with reference to Raphanobrassica), Character of Polyploidy and its significance of Polyploidy. **-15h**

Nucleic acids: Chemical composition of DNA and RNA.

RNA: Occurrence, types, structure, functions.

DNA: Occurrence, types, structure (double helix model), mechanism of DNA replication (semi conservative method)

Gene Mutation: Mutation and Mutagens (spontaneous, induced: point mutation).

Concept of Gene: Gene expression and regulation- exons, introns, inducible and repressible genes: the operon concept; lac operon(inducible)and repression operon(tryptophan).

Genetic Code: Code dictionary, properties of genetic code.

Protein synthesis: Central dogma: mechanism of protein synthesis transcription and translation: co-linearity. **- 15h**

Mendelian Genetics : Biography of Mendel in brief: Mendel's experiments: Monohybrid cross-law of dominance, law of segregation, purity of gametes. Homozygous, heterozygous, phenotype, genotype, monohybrid test cross, Dihybrid cross – law of independent assortment, dihybrid test cross. Mention of trihybrid crosses, incomplete dominance (*Mirabilis jalapa*, Snapdragon).

Modification of Mendelian Ratios: (With reference to plant examples) Interaction of genes – Epistasis(dominant and recessive); supplementary factors, complementary factors: multiple alleles(self-sterility in *Nicotiana*), Linkage and crossing over(*Maize*).

Sex determination in plants: Chromosomal mechanisms of sex determination methods- XX-XY, ZZ-ZW and XX-XO (only plant examples)- *Melandirum*, *Rumex acetosa* (tripartite), *Humulus lupulus* (tetrapartite). **- 15h**

B.Sc., Botany

FIFTH SEMESTER

PAPER- VI: CELL BIOLOGY AND CYTOGENETICS-PRACTICAL SYLLABUS

1. Preparation of Mitotic slides. Ex: Onion root tips.
2. Preparation of Meiotic slides. Ex :Onion flower buds, Rheo
3. Study of different stages of mitosis and meiosis from permanent slides.
4. Solve the genetic problems from the given list
5. Technique of making permanent slides in mitosis and meiosis

B.Sc., Botany

FIFTH SEMESTER

PAPER- VI: CELL BIOLOGY AND CYTOGENETICS

Model Practical question paper -VI

Duration: 3 hrs

Marks - 40

1. Prepare squash of material 'A' Identify, sketch, label the stages with reasons. -08
 2. Prepare smear of material 'B' Identify, sketch , label the stages with reasons. -06
 3. Identify the slides 'C' and 'D'(one from mitosis and one from meiosis) -06
 4. Solve the genetic problem 'E' and 'F' -10
- Viva -05
Record -05

PAPER- VI: CELL BIOLOGY AND CYTOGENETICS

SCHEME OF EVALUATION FOR PAPER-VI

Duration: 3 hrs

Marks - 40

1. Prepare squash of material 'A' Identify, sketch, label the stages with reasons. -08
Preparation=05 marks
Identification with reasons=01 marks
Sketch & label=02 marks
2. Prepare smear of material 'B' Identify, sketch, label the stages with reasons. -06
Onion/Rheo flower bud
Preparation=03 marks
Identification =01 marks
Sketch & label=02 marks
3. Identify the slides 'C' and 'D'(one from mitosis and one from meiosis) -06
Identification =01 marks, reason=01 marks
Sketch & label=01 marks
4. Solve the genetic problem 'E' and 'F' -10
Monohybrid/dihybrid/interaction factors/incomplete dominance/crossing over
Viva -05
Record -05

B.Sc., Botany

SIXTH SEMESTER

Paper- VII(SSF 790). Q.P. Code 15649.

PLANT PHYSIOLOGY

Theory	
Total theory marks	-50
I A marks for theory	- 10
Total number of teaching hours / sem	- 45hr
Total number of teaching hours / week	- 03hr
Duration of theory exam	-03hr
Practical- Based on theory paper VII	
Max. marks	-40
Total number practical / week	-01
Duration	-03hr
Duration of practical exam	-03hr

Plant Water Relation: Significance of water for plants. Solutions (Molar and Mole), colloidal systems (hydrophilic and hydrophobic). Osmosis (O.P, T.P, D.P.D, and water potential. Plasmolysis, exosmosis, deplasmolysis and endosmosis)

Absorption of water: Mechanism active osmotic and active non osmotic absorption and passive absorption. Ascent of sap-path (only Balsam experiment) mechanism, Root pressure and T.C.T theory.

Absorption of Mineral Salts: Mechanism of absorption passive absorption (diffusion, mass flow, -exchange, Donnan equilibrium), active absorption (Lundergardh and Burstrom) Cytochrome pump theory, Lecithin cycle , carrier concept) **.- 10hr**

Mineral Nutrition: Essential and Non-essential elements, Micro and Marco nutrients. Role and deficiency symptoms of N.P.K and Mg, Fe, Cu.

Transpiration: Types of transpiration, mechanism of stomatal transpiration – structure of stomata, mechanism of stomatal movement. Significance of transpiration, Guttation and wilting point.

Translocation of Solutes: Types (upward, radial and downward), path (phloem ringing experiment, protoplasmic streaming theory, and mass flow theory).

Enzymes: Nomenclature, structure, classification and properties. **- 10hr**

Photosynthesis: Structure and function of chloroplast, photosynthesis pigment, Photosystem I and Photosystem II. The Z scheme the light, and dark reaction, C3 and C4 pathway. The law of limiting factor, factors affecting photosynthesis. Photosynthesis in bacteria. CAM photosynthesis.

Respiration: Introduction, types, Biochemical pathways of respiration –glycolysis. TCA cycle, electron transport system and terminal oxidation. An account of photorespiration and its significance. An account of anaerobic respiration and fermentation. Signification as an industrial process. **- 15h**

Carbohydrates: Importance of carbohydrates, definition, classification, common carbohydrates in plant glucose, fructose, sucrose, starch, cellulose, pectose.

Phytohormones: Definition, types of hormones, physiological and practical application of auxins, gibberellins, cytokinins, ethylene, ABA.

Physiology of flowering: Photoperiodism, types, role of phytochrome, vernalisation, seed dormancy.

Plant Movement: Introduction, classification, trophic movement. **- 10h**

B.Sc., Botany

SIXTH SEMESTER

PAPER-VII; PRACTICAL SYLLABUS

List of major experiments.

1. Measurement of DPD in plants (Potato) by gravimetric method.
2. Ganong's photometer – Rate of transpiration under different conditions of light and wind.
3. Relation between absorption and transpiration.
4. Suction force due to transpiration.
5. Evolution of oxygen by bubble counting method under different wave length of light using color transparencies – Normal, Red, blue, yellow or green (During examination different condition need not to be asked).
6. Experiment to demonstrate the presence of starch in leaves.
7. Separation of chlorophyll pigments by paper chromatographic method.
8. Ganong's respirometer- demonstrated that CO₂ is liberated during respiration.

List of Minor experiments

1. Potato osmoscope to demonstrate endosmosis and ex-osmosis
2. Bell jar experiment
3. Light's screen experiment
4. Mohl's half leaf experiment.
5. Dewar's flask expt
6. Kuhne's fermentation vessel
7. Phototropism
8. Hydrotropism
9. Geotropism
10. Arc indicator

Paper- VII (SSF 790). PLANT PHYSIOLOGY

Time- 3 hrs

Marks - 40

Practical VII: Question paper model

1. Conduct major experiment **A**. Write Requirement, Procedure, Record the Results with conclusions **-12**
2. Comment on experiment **B , C and D.** **-12**
3. Investigate the chemical nature of **E.** **-06**
4. Viva **- 05**
5. Record **-05**

PLANT PHYSIOLOGY

SCHEME OF EVALUATION FOR PAPER-VII

Time- 3 hrs

Marks - 40

Practical VII: Question paper model

1. Conduct major experiment **A**. Write Requirement, Procedure, Record the Results with conclusions
Requirement-02, Procedure-03, Experiment settings-03, Record the Results with conclusions -02. Diagram-02 **-12**
2. Comment on experiment **B , C and D.** **-12**
Comments=04 marks
3. Investigate the chemical nature of **E.** **-06**
Positive result=03 marks, Negative result=03 marks
4. Viva **- 05**
5. Record **-05**

B.Sc., Botany

SIXTH SEMESTER

Paper- VIII. (SSF 791). Q.P.Code 15650

PLANT BREEDING, BIOTECHNOLOGY, PLANT TISSUE CULTURE AND EVOLUTION

Theory	
Total theory marks	-50
I A marks for theory	- 10
Total number of teaching hours / sem	- 45hr
Total number of teaching hours / week	- 03hr
Duration of theory exam	-03hr
Practical- Based on theory paper VIII	
Max. marks	-40
Total number practical / week	-01
Duration	-03hr
Duration of practical exam	-03hr

Plant breeding: Principles and objectives : Methods of breeding (Mass selection, single plant or pure line selection, clonal selection, progeny selection, recurrent selection). Significance of plant breeding- increase in yield, resistance to disease and insect pests. Plant breeding in producing new and improved varieties of medicinal plants.

Hybridization: Objectives, steps in hybridization, classification- intraspecific, interspecific and intergeneric crosses with suitable examples.

Propagation: Cutting-root and stem, layering- simple, compound and gooty. Grafting- wedge grafting, approach grafting, Bud grafting.

Evolution: Brief account of theories of evolution – Lamarck, Weismann, Darwin and De-varies, Modern synthetic theories. **- 17hr**

Biotechnology: Introduction: General procedure and scope of genetic engineering (r-DNA technology), PCR technology, production of polyclonal and monoclonal antibodies, general aspects of ELISA technique. Gene mapping.

Application of biotechnology in pharmaceutical, agriculture, Industrial, Environmental field and oil spill (Waste management and sewage treatment) .

DNA finger printing and its application

Transgenic plants- Bt cotton, Tomato, Arabidopsis thaliana **-18hr**

Tissue culture: Aim and scope, Totipotency, callus culture, organogenesis through callus culture, somatic embryogenesis, haploid culture (example anther culture), Protoplast fusion. Application of tissue culture in agriculture and human welfare. **-10 hr**

Practical syllabus

Paper VIII – Project work

Practical syllabus- ANY TOPIC

Time– 3 hrs

Marks - 40

Practical VIII: SCHEME OF VALUATION

- | | |
|--------------------------------------|-----|
| 1. Record – Project work Submission. | -20 |
| 2. Practical proper - Presentation. | -10 |
| 3. Viva | -10 |

ಬಿ.ಎ., ಬಿ.ಎಸ್.ಡಬ್ಲ್ಯೂ, ಪ್ರಥಮ ವರ್ಷ
ಮೊದಲನೆ ಸೆಮಿಸ್ಟರ್

ಘಟಕ: 1. ನಾಡು-ನುಡಿ-ಚಿಂತನೆ

3 ಕ್ರೆಡಿಟ್ 4 ಗಂಟೆಗಳು

1. ಕವಿರಾಜಮಾರ್ಗ : ಆಯ್ದು ಭಾಗ (ಎಂಟು ಭಾಗಗಳು)
2. ಲಲಿತವಹ ಕನ್ನಡ : ಮಹಾಲಿಂಗರಂಗ - ಅನುಭವಾಮೃತ
3. ವಿದ್ಯಾರ್ಥಿಗಳಿಗೇಕೆ ಸಾಹಿತ್ಯ : ಕುವೆಂಪು
4. ಕನ್ನಡ ಕಟ್ಟುವ ಕೆಲಸ : ಹಾಮಾನಾ

ಘಟಕ:2 ಪ್ರಕೃತಿ

1. ಯದುಗಿರಿಯ ಮೌನವಿಕಾಸ : ಪು.ತಿ.ನ.
2. ಜನಪದರು ಕಂಡ ಪ್ರಕೃತಿ : ಆಯ್ದು ಎಂಟು ಕವಿತೆಗಳು
3. ದ್ಯಾವ ಪೃಥ್ವಿ : ವಿ.ಕೃ.ಗೋಕಾಕ್
4. ಹಸಿರು ಹೊನ್ನು (ಎರಡು ಭಾಗ) : ಬಿ.ಜಿ.ಎಲ್. ಸ್ವಾಮಿ

ಘಟಕ : 3 ಬಾಲ್ಯ

1. ಬಾಲ್ಯದ ನೆನೆಪುಗಳು, : ಶಾಂತಾ ಹುಬ್ಬೀಕರ್ (ಆಯ್ದು ಭಾಗ)
2. ಉಮಾಪತಿಯ ಸ್ಕಾಲರ್ ಶಿಫ್ಟ್‌ಯಾತ್ರೆ : ಪಿ.ಲಂಕೇಶ್
3. ನೆನಪಿದೆಯಾ ನಿನಗೆ? (vÀÄÄUÀ`sAzÉæ-PA«vÉ): ಕೆ.ಎಸ್.ನರಸಿಂಹಸ್ವಾಮಿ

ಘಟಕ: 4 ಸಂಕೀರ್ಣ

1. ಪುಟ್ಟಕತೆಗಳು (ಆಯ್ದು ಮೂರು) : ನೈಜಪ್ರೇಮ /ಗೋಡೆಗೆ ಹೇಳಿ
2. ನಾಣ್ಯ ಮುದ್ರಣ ತಾಂತ್ರಿಕತೆ ಮತ್ತು ಪಾಂಚಾಳರು : ಡಾ.ವೀರೇಶ್ ಬಡಿಗೇರ್
3. ಚಲನ ಚಿತ್ರಗೀತೆ : ಬಂಗಾರದ ಮನುಷ್ಯ (ನಗುನಗುತಾ ನಲಿನಲಿ)
4. ಕ್ಷಮಿಸಿ, ಸಾಫ್ಟ್‌ವೇರ್ ಕರೆಪ್ಪಾಗಿದೆ : ಶಿವಸುಂದರ್

ಬಿ.ಎ., ಬಿ.ಎಸ್.ಡಬ್ಲ್ಯೂ, ಪ್ರಥಮ ವರ್ಷ

3 ಕ್ರೆಡಿಟ್ 4 ಗಂಟೆಗಳು

(ಎರಡನೇ ಸೆಮಿಸ್ಟರ್)

ಘಟಕ: 1 ಜಾಗತೀಕರಣ

1. ಜಾಗತೀಕರಣ ಮತ್ತು ಸಂಸ್ಕೃತಿ : ರಾಜೇಂದ್ರಚನ್ನಿ
2. ಯೆ ದಿಲ್ ಮಾಂಗೇ ಮೋರ್ : ಅಮರೇಶ ನುಗಡೋಣಿ

3. ಎಲ್ಲಾಮಾಯ : ಗೊಲ್ಲಹಳ್ಳಿ ಶಿವಪ್ರಕಾಶ
4. ಬಳೆಗಳ ಸೇಲ್ಮಮನ್ : ಪ್ರತಿಭಾ ನಂದಕುಮಾರ

ಘಟಕ: 2 ಸಮಾಜ

1. ಹಳ್ಳಿಯ ಚಿತ್ರಗಳು (ಒಂದು ಲೇಖನ) : ಗೊರೂರು ರಾಮಸ್ವಾಮಿ ಅಯ್ಯಂಗಾರ್
2. ಬಚ್ಚೀಸು : ದು.ಸರಸ್ವತಿ
3. ಅಪ್ಪ : ಚಂಪಾ
4 ನನ್ನ ಜನಗಳು : ಸಿದ್ದಲಿಂಗಯ್ಯ

ಘಟಕ:3: ಪ್ರೀತಿ

1. ಮೋಕ್ಷವ ಹುಡುಕುತ್ತ ಪ್ರೀತಿಯ ಬಂಧನದಲ್ಲಿ : ಪಿ.ಲಂಕೇಶ್
2. ನಾನು ಬಡವಿ : ದ.ರಾ.ಬೇಂದ್ರೆ
3. ಅಮೃತಮತಿಯ ಸ್ವಗತ : ಎಚ್.ಎಲ್.ಪುಷ್ಪ
4. ಕೊನೆಯ ದಾರಿ : ವೀಣಾ ಶಾಂತೇಶ್‌ವರ

ಘಟಕ : 4 (ಸಂಕೀರ್ಣ)

1. ರೊಟ್ಟಿ ಮತ್ತು ಕೋವಿ : ಸು.ರಂ. ಎಕ್ಕುಂಡಿ
2. ಮನಸ್ಸಿನ ಸಾಮರ್ಥ್ಯವನ್ನು ತಗ್ಗಿಸುವ ಅಂಶಗಳು : ಡಾ.ಸಿ.ಆರ್.ಚಂದ್ರಶೇಖರ್
3. ಬಿಚ್ಚಿದ ಜೋಳಿಗೆ(ಆಯ್ದುಭಾಗ) : ಜಿ.ಎಚ್. ನಾಗಲೋಟಿಮರ್
4. ಕೀಟದಿಂದ ಕೋಟಿನಾಶ : ಶಿವಾನಂದ ಕಳವೆ

ಪ್ರಥಮ ಬಿ.ಎಸ್.ಸಿ. (ಮೊದಲನೆ ಸೆಮಿಸ್ಟರ್)

3 ಕ್ರೆಡಿಟ್ 4 ಗಂಟೆಗಳು

ಘಟಕ: 1 : ಕನ್ನಡ ನಾಡು -ನುಡಿ-ಚಿಂತನೆ

1. ಕವಿರಾಜಮಾರ್ಗ (ಆಯ್ದು) ಎಂಟು ಪದ್ಯಗಳು) : ಶ್ರೀವಿಜಯ
2. ವಿದ್ಯಾರ್ಥಿಗಳಿಗೇಕೆ ಸಾಹಿತ್ಯ : ಕುವೆಂಪು
3. ಇಳೆಯೆಂದರೆ ಬರಿ ಮಣ್ಣಲ್ಲ : ದ.ರಾ.ಬೇಂದ್ರೆ
4. ಹಚ್ಚೇವು ಕನ್ನಡದ ದೀಪ : ಡಿ.ಎಸ್.ಕರ್ಕಿ

ಘಟಕ: 2 ಭೂಮಿ

1. ಇರುವುದೊಂದೇ ಭೂಮಿ : ನಾಗೇಶ್‌ಹೆಗಡೆ

2. ಕುಂಕುಮ ಭೂಮಿ : ಕೆ.ಎಸ್.ನ.
3. ಜನಪದ ತ್ರಿಪದಿಗಳು (ಆಯ್ದು ಎಂಟು) : ಸುವರ್ಣ ಜನಪದ ಕಾವ್ಯ
4. ಯಾರ್ಯಾರ ನೆನೆಯಾಲಿ : ಜಾನಪದ

ಘಟಕ: 3: ವೈಜ್ಞಾನಿಕ ಮನೋಧರ್ಮ

1. ವೈಜ್ಞಾನಿಕ ಮನೋಧರ್ಮ : ಜಿ.ಟಿ.ನಾರಾಯಣರಾವ್
2. ಜ್ಯೋತಿಷ್ಯ ಅರ್ಥಪೂರ್ಣವೋ, ಅರ್ಥರಹಿತವೋ : ಎಚ್.ನರಸಿಂಹಯ್ಯ
3. ಯಾವಕಾಲದ ಶಾಸ್ತ್ರ ಏನು ಹೇಳಿದರೇನು : ಕುವೆಂಪು
4. ಹೊಸಹುಟ್ಟಿನ ಹಾಡು : ನ.ಉಷಾ

ಘಟಕ: 4 : ಸಂಕೀರ್ಣ

1. ನಮ್ಮ ಅಳತೆಯನ್ನು ಮೀರಲಾಗದ ದೇವರು : ಶಿವರಾಮ ಕಾರಂತ
2. ಒಡಲಾಳ ಕಾದಂಬರಿಯ ಆಯ್ದು ಭಾಗ(ಪುಟ್ಟಗೌರಿನವಿಲು ಪ್ರಸಂಗ): ದೇವನೂರ ಮಹಾದೇವ
3. ಕಾಣದಂತೆ ಮಾಯವಾದನೊ - ಚಲನಚಿತ್ರಗೀತೆ : ಚಲಿಸುವ ಮೋಡಗಳು
4. ಭಾಗ್ಯಾದ ಬಳಿಗಾರ ಹೋಗಿ ಬಾ ನನತವರೀಗೆ (ಜನಪದಗೀತೆ)

ಪ್ರಥಮ ಬಿ.ಎಸ್.ಸಿ. ಎರಡನೇ ಸೆಮಿಸ್ಟರ್ 3 ಕ್ರೆಡಿಟ್ 4 ಗಂಟೆಗಳು

ಘಟಕ : 1 : ಜೀವನಕಲೆ

1. ಸ್ಕೂಟರ್ ರಿಪೇರಿ (ಅಣ್ಣನ ನೆನಪುಗಳು) : ಪೂರ್ಣಚಂದ್ರ ತೇಜಸ್ವಿ
2. ಗಾಡಿಯ ಪಯಣ : ಎ.ಎನ್.ಮೂರ್ತಿರಾಯರು
3. ಮಂಕುತಿಮ್ಮನ ಕಗ್ಗ (ಎಂಟು ಪದ್ಯಗಳು) : ಡಿ.ವಿ.ಜಿ.
4. ಪರದೆ ಸರಿದಂತೆ : ಡಿ.ಬಿ.ರಜಿಯಾ

ಘಟಕ : 2 : ಕನಸು

1. ಸಣ್ಣಸಾಲ : ದುಡ್ಡನಹಳ್ಳಿ ಮಂಜುನಾಥ (ಕತೆ)
2. ರಂಗಣ್ಣನ ಕನಸಿನ ದಿನಗಳು (ಎರಡು ಲೇಖನಗಳು) : ಎಸ್.ವಿ.ರಂಗಣ್ಣ
3. ಕಲ್ಪಿ : ಕುವೆಂಪು
4. ತಂದೆ ಮನೆ ಕಿಟಕಿ : ವೈದೇಹಿ

ಘಟಕ : 3: ಮಳೆ

- | | |
|----------------------|--------------------|
| 1. ಯಾತಕ್ಕೆ ಮಳೆ ಹೋದವೋ | : ಜನಪದ ಗೀತೆ |
| 2. ಧಾರವಾಡದ ಮಳೆ | : ಚನ್ನವೀರ ಕಣವಿ |
| 3. ಮಳೆಬಂದರೆ | : ಭುವನೇಶ್ವರಿ ಹೆಗಡೆ |
| 4. ಮಳೆಕೊಯ್ಲು | : ಶ್ರೀಪದ್ಮೆ |

ಘಟಕ: 4 : (ಸಂಕೀರ್ಣ)

- | | |
|----------------------------|-----------------------|
| 1. ಕಂಪ್ಯೂಟರ್ ಕನ್ನಡ | : ಎನ್.ಎ.ಎಂ. ಇಸ್ಮಾಯಿಲ್ |
| 2. ಅಸಮಾನತೆಯ ಜಾಗತೀಕರಣ | : ಪಿ.ಸಾಯಿನಾಥ |
| 3. ಮಾನವೀಯತೆ : ಒಂದು ಅನಿಸಿಕೆ | : ಬರಗೂರು ರಾಮಚಂದ್ರಪ್ಪ |
| 4. ಸೀಸೆನಾಟು | : ಚಾಂದಿನಿ |

ಪ್ರಥಮ ಬಿ.ಕಾಂ. ಮೊದಲನೆ ಸೆಮಿಸ್ಟರ್

3 ಕ್ರೆಡಿಟ್ 4 ಗಂಟೆಗಳು

ಘಟಕ: 1 ಕನ್ನಡ ನಾಡು ನುಡಿ ಚಿಂತನೆ

- | | |
|-------------------------------------|----------------|
| 1. ಕವಿರಾಜಮಾರ್ಗ (ಆಯ್ದು ಎಂಟು ಪದ್ಯಗಳು) | : ಶ್ರೀವಿಜಯ |
| 2. ವಿದ್ಯಾರ್ಥಿಗಳಿಗೇಕೆ ಸಾಹಿತ್ಯ | : ಕುವೆಂಪು |
| 3. ಕನ್ನಡ ದಾಸಯ್ಯ | : ಶಾಂತಕವಿ |
| 4. ಕನಸಿನೋಳಗೊಂದು ಕಣಸು | : ದ.ರಾ.ಬೇಂದ್ರೆ |

ಘಟಕ: 2: ಸಂಸ್ಕೃತಿ

- | | |
|----------------------------|--------------------|
| 1. ಕರ್ನಾಟಕ ಗತವೈಭವ | : ಆಲೂರು ವೆಂಕಟರಾಯರು |
| 2. ಕರುಳಭಾಷೆಯ ಕೊರಳಭಾಷೆಯಾದಾಗ | : ಪ್ರಕಾಶ್ ರೈ |
| 3. ಕೂಸಿನ ಹಾಡು | : ಜನಪದ ಗೀತೆ |
| 4. ಜಾತ್ರೆಯಲ್ಲಿ ಶಿವ | : ಸವಿತಾ ನಾಗಭೂಷಣ |

ಘಟಕ:3 ಜಾಗತೀಕರಣ

- | | |
|-------------------------------------|-----------------------|
| 1. ಬುದ್ಧಗಂಟೆಯ ಸದ್ದು | : ಮಹಾಂತೇಶ್ ನವಲ್ಕಲ್ |
| 2. ಅಬಚೂರಿನ ಪೋಸ್ಟ್ ಆಫೀಸು | : ಪೂರ್ಣಚಂದ್ರತೇಜಸ್ವಿ |
| 3. ಖಾಲಿ ಸೈಟುಗಳು | : ಕೆ.ಎಸ್.ನಿಸಾರ್ ಅಹಮದ್ |
| 4. ಮುಖವಾಡಗಳ ಮಾರುವ ಊರಿನಲ್ಲೊಂದು ಸುತ್ತ | : ಎಂ.ಆರ್. ಕಮಲ |

ಘಟಕ : 4: ಸಂಕೀರ್ಣ

1. ಪತ್ರಿಕೆ ಮತ್ತು ಪ್ರಚಾರ ಮಾಧ್ಯಮ : ಜಿ.ಎನ್. ಮೋಹನ
2. ಎಲ್ಲರೂ ಆಕೆಗೆ ಚಿತ್ರಹಿಂಸೆ ಕೊಟ್ಟೇ ಹುಟ್ಟಿದ್ದೀವಿ : ಟಿ.ಕೆ. ದಯಾನಂದ
3. ಹೊಸಹಾದಿ : ಗೋಪಾಲಕೃಷ್ಣ ಅಡಿಗ
4. ಮಾರುಕಟ್ಟೆ : ಎಚ್.ಎಸ್.ಶಿವಪ್ರಕಾಶ್

ಬಿ.ಕಾಂ. (ಎರಡನೆ ಸೆಮಿಸ್ಟರ್)

3 ಕ್ರೆಡಿಟ್ 4 ಗಂಟೆಗಳು

ಘಟಕ: 1 ಸೌಂದರ್ಯ

1. ಸೌಂದರ್ಯ ಮತ್ತು ಮೈಬಣ್ಣ : ರಾಮಮನೋಹರ ಲೋಹಿಯ
2. ಅಳುವ ಕಂದನ ತುಟಿಯು (ಎಂಟು ತ್ರಿಪದಿಗಳು) : ಜಾನಪದ
3. ಕಂಗೆಡಿಸುತ್ತಲೇ ಬಂದಿದೆ ಸೌಂದರ್ಯದ ಕ್ರೂರ ಸತ್ಯ : ಕೆ.ಎನ್. ಗಣೇಶಯ್ಯ
4. ಪೂರ್ವಾಂಗನೆ ಪಶ್ಚಿಮಾಂಗನೆಗೆ : ಸಿದ್ದಯ್ಯ ಪುರಾಣಿಕ

ಘಟಕ : 2 , ಭಕ್ತಿ

1. ಪ್ರಾರ್ಥನೆ : ಬಿ.ಎಂ. ಶ್ರೀಕಂಠಯ್ಯ
2. ಪ್ರಥಮ ರಾಜನಿಗೆ : ಕೆ.ಎಸ್.ನರಸಿಂಹಸ್ವಾಮಿ
3. ಗೆದ್ದು ಬಾರಯ್ಯ ನನ್ನ ದನಿವೀಗೆ : ಜಿ.ಶಂ. ಪರಮಶಿವಯ್ಯ
4. ಅಶೋಕನ ಧರ್ಮ : ನಾ.ಕಸ್ತೂರಿ

ಘಟಕ : 3 ದೇಸಿಯತೆ

1. ಬಿದಿರಮ್ಮ ತಾಯಿ ಕೇಳಿ : ಜನಪದ
2. ದೇಸಿಯತೆಯ ಪ್ರಶ್ನೆ : ಓ.ಎಲ್.ಎನ್. ನಾಗಭೂಷಣಸ್ವಾಮಿ
3. ದೇಸಿಯ ನೆಲೆಗಳ ಹುಡುಕಾಟ : ಜಿ.ಎಸ್.ಶಿವರುದ್ರಪ್ಪ
4. ಗಿಡುಗ ಮತ್ತು ಎರೆಹುಳ : ಎಸ್.ಜಿ. ಸಿದ್ದರಾಮಯ್ಯ

ಘಟಕ: 4 ಸಂಕೀರ್ಣ

1. ಸರಳ ಮದುವೆ (ಸಾವಿತ್ರಿ ಬಾಯಿ ಪುಲೆ) : ಎಚ್.ಎಸ್.ಅನುಪಮಾ
2. ಮಗು ಮತ್ತು ಸ್ವರ್ಗ : ಮಾನಸಿಕ ಅಗತ್ಯ : ಮೀನಗುಂಡಿ ಸುಬ್ರಹ್ಮಣ್ಯಂ
3. ಈ ಬಾಳು ಬಣ್ಣದ ಬುಗುರಿ (ಚಲನಚಿತ್ರಗೀತೆ) : ಮಹಾಕ್ಷತ್ರಿಯ

4. ಸಿಂಧೂನದಿಯ ದಂಡೆಯ ಮೇಲೆ : ಚಂದ್ರಶೇಖರ ತಾಳ್ಯ

ಬಿ.ಬಿ.ಎ. : ಪ್ರಥಮ ಸೆಮಿಸ್ಟರ್ 3 ಕ್ರೆಡಿಟ್ 4 ಗಂಟೆಗಳು

ಘಟಕ: 1 ನಾಡು-ನುಡಿ- ಚಿಂತನೆ

1. ಕವಿರಾಜಮಾರ್ಗ (ಆಯ್ದು ಎಂಟು ಪದ್ಯಗಳು) : ಶ್ರೀವಿಜಯ
2. ವಿದ್ಯಾರ್ಥಿಗಳಿಗೇಕೆ ಸಾಹಿತ್ಯ : ಕುವೆಂಪು
3. ಲಲಿತವಹ ಕನ್ನಡ : ಮಹಲಿಂಗರಂಗ
4. ಇಳೇಯೆಂದರೆ ಬರಿ ಮಣ್ಣಲ್ಲ : ದ.ರಾ.ಬೇಂದ್ರೆ

ಘಟಕ:2 : ಆಧುನಿಕತೆ

1. ಮುಂಬೈ ಜಾತಕ : ಜಿ.ಎಸ್.ಶಿವರುದ್ರಪ್ಪ
2. ಎಲ್ಲಾ ಮಾಯವೋ : ಎಚ್.ಎಸ್.ಶಿವಪ್ರಕಾಶ್
3. ಪ್ರಜಾಪ್ರಭುತ್ವ ಮತ್ತು ಮೂರು ಮಂಗಗಳು : ಬೆನಗರಹಳ್ಳಿ ರಾಮಣ್ಣ
4. ಈ ಸಾವು ನ್ಯಾಯವೇ? : ರಹಮತ್ ತರೀಕೆರೆ

ಘಟಕ:3 ಕುಟುಂಬ

1. ವಿಶ್ವಾ ಕುಟುಂಬಿಯ ಕಷ್ಟ : ಪು.ತಿ.ನ
2. ಮೊಸರಿನ ಮಂಗಮ್ಮ : ಮಾಸ್ತಿ
3. ಮನೆ ತುಂಬಿಸುವುದು : ವಿ.ಸೀತಾರಾಮಯ್ಯ
4. ನಮ್ಮ ಮನೆಯದೀಪ : ಹಾ.ಮಾ.ನಾಯಕ

ಘಟಕ: 4 ಸಂಕೀರ್ಣ

1. ನಮ್ಮ ಪ್ರೀತಿಯ ಕ್ರಿಕೆಟ್ : ಕೆ.ಸತ್ಯನಾರಾಯಣ
2. ಕ್ಷಮಿಸಿ ಸಾಫ್ಟ್‌ವೇರ್ ಕರೆಪ್ಪಾಗಿದೆ : ಶಿವಸುಂದರ
3. ಎಲ್ಲೋಜೋಗಪ್ಪ ನಿನ್ನರಮನೆ : ಜಾನಪದ
4. ಒಲವೆ ಜೀವನ ಸಾಕ್ಷಾತ್ಕಾರ (ಚಿತ್ರಗೀತೆ): ಸಾಕ್ಷಾತ್ಕಾರ

ಬಿ.ಬಿ.ಎ. (ಎರಡನೇ ಸೆಮಿಸ್ಟರ್) 3 ಕ್ರೆಡಿಟ್ 4 ಗಂಟೆಗಳು

ಘಟಕ: 1 ಕಾಯಕ

1. ಅನ್ನದ ಕಾಯಕ : ಖಾದಿ ಶಾಮಣ್ಣ
2. ಕೈಮಗ್ಗ ಚಳುವಳಿ : ಪ್ರಸನ್ನ
3. ಕಮ್ಮಾರ : ಪೇಜಾವರ ಸದಾಶಿವರಾಯ
4. ನೇಗಿಲಯೋಗಿ : ಕುವೆಂಪು

ಘಟಕ: 2 ಸಾಮರಸ್ಯ

1. ಮಾನವನೆಯಲಿ : ಎನ್.ಎಸ್.ಲಕ್ಷ್ಮೀನಾರಾಯಣಭಟ್ಟ
2. ಹಾಕಿದ ಜನಿವಾರವ : ಶಿಶುನಾಳ ಷರೀಫ್
3. ಮುಟ್ಟಿಸಿಕೊಂಡವನು : ಪಿ.ಲಂಕೇಶ್
4. ದೇವರ ಮೊದಲ ತೊದಲು : ಪಂಡಿತ ತಾರಾನಾಥ್

ಘಟಕ:3 ಅಂತಃಕರಣ

1. ಕಣಿವೆಯ ಮುದುಕ : ಪು.ತಿ.ನ
2. ನಾಗಿ : ಕುವೆಂಪು
3. ನಾನು ಕೊಂದ ಹುಡುಗಿ : ಆನಂದ
4. ಜೀವ ಉಳಿಸಲು ಹೊಸ ಜೀವ ಸೃಷ್ಟಿ : ನಾಗೇಶ ಹೆಗಡೆ

ಘಟಕ: 4 ಸಂಕೀರ್ಣ

1. ಕೌದಿ : ಬ್ರಹ್ಮದೇವ ಹದಳಗಿ
2. ಮಸಣಕ್ಕೆ ಮರಬೆಳೆದವರು : ಶಿವಾನಂದ ಕಳವೆ
3. ಹದಿಹರೆಯದವರ ಸಮಸ್ಯೆಗಳು : ಡಾ.ಕೆ.ಆರ್.ಶ್ರೀಧರ್
4. ಸೀಸನಾಟು : ಚಾಂದಿನಿ

ಬಿ.ಸಿ.ಎ. (ಪ್ರಥಮ ಸೆಮಿಸ್ಟರ್) 3 ಕ್ರೆಡಿಟ್ 4 ಗಂಟೆಗಳು

ಘಟಕ: 1 ಕನ್ನಡ ನಾಡು ನುಡಿ ಚಿಂತನೆ

1. ಕವಿರಾಜಮಾರ್ಗ(ಎಂಟು ಪದ್ಯಗಳು) : ಶ್ರೀವಿಜಯ
2. ವಿದ್ಯಾರ್ಥಿಗಳಿಗೇಕೆ ಸಾಹಿತ್ಯ : ಕುವೆಂಪು
3. ಉದಯವಾಗಲಿ ನಮ್ಮ ಚೆಲುವ ಕನ್ನಡನಾಡು : ಹುಯಿಲಗೋಳ ನಾರಾಯಣರಾವ್
4. ನನ್ನ ಕನ್ನಡ ಜಗತ್ತು : ಕೆ.ವಿ.ಸುಬ್ಬಣ್ಣ

ಘಟಕ: 2 ಆಕಾಶ

1. ಆಕಾಶಬುಟ್ಟಿ : ಚನ್ನವೀರ ಕಣವಿ
2. ಆಕಾಶ ಮತ್ತು ಬೆಕ್ಕು : ಯು.ಆರ್.ಅನಂತಮೂರ್ತಿ
3. ರಾಗರತಿ : ದ.ರಾ.ಬೇಂದ್ರೆ
4. ಆಕಾಶ ಕಾಯಗಳು : ವೈಜ್ಞಾನಿಕ ಲೇಖನ

ಘಟಕ: 3 : ತಾರುಣ್ಯ

1. ವರ್ಧಮಾನ : ಗೋಪಾಲಕೃಷ್ಣ ಅಡಿಗ
2. ಸುಟ್ಟಾವು ಬೆಳ್ಳಿಕಿರಣ : ಸಿದ್ದಲಿಂಗಯ್ಯ
3. ಅಮಾಸ : ದೇವನೂರು ಮಹದೇವ
4. ಸಮಯದ ಸಮಸ್ಯೆ : ಮನೋವೈಜ್ಞಾನಿಕ ಬರಹ : ಡಾ. ಮೀನಗುಂಡಿ ಸುಬ್ರಹ್ಮಣ್ಯ

ಘಟಕ: 4 ಸಂಕೀರ್ಣ

1. ಮಾನವೀಯತೆ : ಒಂದು ಅನಿಸಿಕೆ : ಬರಗೂರು ರಾಮಚಂದ್ರಪ್ಪ
2. ಸಂಬಂಧ : ಆಲನಹಳ್ಳಿ ಕೃಷ್ಣ
3. ಪತ್ರಿಕೆ ಮತ್ತು ಪ್ರಚಾರ ಮಾಧ್ಯಮ : ಜಿ.ಎನ್. ಮೋಹನ
4. ಸರಳ ಮದುವೆ (ಸಾವಿತ್ರಿಬಾಯಿಪುಲೆ) : ಎಸ್.ಎಸ್ ಅನುಪಮ

ಬಿ.ಸಿ.ಎ

(ಎರಡನೇ ಸೆಮಿಸ್ಟರ್)

3 ಕ್ರೆಡಿಟ್ 4 ಗಂಟೆಗಳು

ಘಟಕ: 1 ವಾಣಿಜ್ಯ

1. ಕುರುಡು ಕಾಂಚಾಣ : ದ.ರಾ.ಬೇಂದ್ರೆ
2. ಕುದುರೆ : ಜಿ.ಪಿ.ಬಸವರಾಜ
3. ಸಂತೆ : ಸಿದ್ದಲಿಂಗಯ್ಯ
4. ಹಾಲಿನವಳ ಲೆಕ್ಕ : ಅ.ರಾ.ಮಿತ್ರ

ಘಟಕ: 2 ತಂತ್ರಜ್ಞಾನ

1. ಗಿರಣಿ ವಿಸ್ತಾರ ನೋಡಮ್ಮ : ಶಿಶುನಾಳ ಷರೀಪ

2. ಮನುಷ್ಯ ಮತ್ತು ಯಂತ್ರ : ಗಾಂಧೀಜಿ : ಡಿ.ಎಲ್.ನರಸಿಂಹಚಾರ್
3. ತಂತ್ರಜ್ಞಾನ ಮತ್ತು ಕನ್ನಡ : ಕೆ.ವಿ.ನಾರಾಯಣ
4. ಯಂತ್ರರ್ಷಿ : ಕುವೆಂಪು

ಘಟಕ : 3 ದಾಂಪತ್ಯ

1. ಸಖೀಗೀತ (ಆಯ್ದುಭಾಗ) : ದ.ರಾ.ಬೇಂದ್ರೆ
2. ಬಾರೆ ನನ್ನ ಶಾರದೆ : ಕೆ.ಎಸ್.ನರಸಿಂಹಸ್ವಾಮಿ
3. ಕಡೆತನಕ ಕಾಯೋ ಅಭಿಮಾನ : ವಿನಯಾ ಒಕ್ಕುಂದ
4. ಕವಿಯ ಹೆಂಡತಿಯ ಕಣ್ಣಿನಲ್ಲಿ : ಶಾಂತಾದೇವಿ ಕಣವಿ

ಘಟಕ: 4. ಸಂಕೀರ್ಣ

1. ಒಂದು ಕತೆ ಮತ್ತು ಒಂದು ಹಾಡು : ಜಾನಪದ
2. ಎರೆಹುಳು ಎಂಬ ವಿಸ್ಮಯ : ಸ್ವಾಮಿ ಆನಂದ
3. ಆಗದು ಎಂದು ಕೈಲಾಗದು ಎಂದು (ಚಲನಚಿತ್ರ ಗೀತೆಗಳು) : ಬಂಗಾರದ ಮನುಷ್ಯ
4. ಕೌದಿ : ಬ್ರಹ್ಮದೇವಹದಳಗಿ

ಮುಕ್ತ ಆಯ್ಕೆ -1 , ಕನ್ನಡ ಭಾಷಾ ಪತ್ರಿಕೆ : 3 ಕ್ರೆಡಿಟ್ 4 ಗಂಟೆಗಳು

ಕನ್ನಡ ವ್ಯಾಕರಣ ಮತ್ತು ಆಡಳಿತ ಕನ್ನಡ

ಸಂಧಿ , ಸಮಾಸ , ವಿಭಕ್ತಿ - ಪ್ರತ್ಯಯಗಳು , ಗುಣವಾಚಕಗಳು , ಅವ್ಯಯಗಳು , ಕೃದಂತಗಳು , ಛಂದಸ್ಸು ಮತ್ತು ಅಲಂಕಾರಗಳು

- ಪರಮರ್ಶನ ಪಠ್ಯಗಳು
1. ಕನ್ನಡ ಕೈಪಿಡಿ - ಬಿ.ಎಂ.ಶ್ರೀ
 2. ಕನ್ನಡ ಮಧ್ಯಮ ವ್ಯಾಕರಣ
 3. ಸ್ವಾರ್ಥಾತ್ಮಕ ಪರಿಚ್ಛೇದಗಳಿಗೆ ಸಿದ್ಧಪಡಿಸಿದ ಇತರ ಪಠ್ಯಗಳು .

ಆಡಳಿತಾತ್ಮಕ ಕನ್ನಡ ಕಲಿಕೆ : 1. ಸಂಕ್ಷಿಪ್ತ ಲೇಖನ

- 2 ಪತ್ರ ಲೇಖನ , ಪಬಂಧ ರಚನೆ .
- 3 ಆಡಳಿತಾತ್ಮಕ ಪದಕೋಶ - ಪರಿಕಲ್ಪನೆಗಳು .
- 4 ಗಾದೆಗಳು , ನುಡಿಗಟ್ಟುಗಳು , ಒಗಟುಗಳು ,

ಪರಮರ್ಶನ ಪಠ್ಯಗಳು

1. ಕಚೇರಿ ಕೈಪಿಡಿ - ಕನ್ನಡ ಮತ್ತು ಸಂಸ್ಕೃತಿ ಇಲಾಖೆ .
2. ಆಡಳಿತಾತ್ಮಕ ಕನ್ನಡ - ಸಿ . ಆರ್ ಪಾರ್ಥಸಾರಥಿ ,
3. ವ್ಯಾವಹಾರಿಕ ಕನ್ನಡ- ಅಬ್ದುಲ್ ಬಶೀರ್
4. ಆಡಳಿತ ಕನ್ನಡ - ಕನ್ನಡ ವಿಶ್ವವಿದ್ಯಾಲಯ
ಈ ತರಹದ ಇನ್ನಿತರ ಪಠ್ಯಗಳು .

* ಮುಕ್ತ ಆಯ್ಕೆ -2 , ಆತ್ಮ ಚರಿತ್ರೆಗಳು ,

3 ಕ್ರೆಡಿಟ್ 4 ಗಂಟೆಗಳು

ಸೆಮಿಸ್ಟರ್ 1 ಆತ್ಮಚರಿತ್ರೆಗಳು

1. ಆತ್ಮ ಚರಿತ್ರೆಗಳ ಪರಂಪರೆ ,
2. ಆತ್ಮ ಚರಿತ್ರೆಗಳು ಮತ್ತು ಚರಿತ್ರೆ
3. ಆತ್ಮ ಚರಿತ್ರೆಗಳ ಸಾಂಸ್ಕೃತಿಕ , ಸಾಮಾಜಿಕ ಹಾಗೂ ವೃತ್ತಿ ಹಿನ್ನೆಲೆ .

ಆತ್ಮ ಚರಿತ್ರೆಗಳ ಮಾದರಿಗಳು

1. ವೃತ್ತಿಪರ ಆತ್ಮ ಚರಿತ್ರೆಗಳು ,
2. ಮಹಿಳಾ ಆತ್ಮ ಚರಿತ್ರೆಗಳು ,
3. ಅಲಕ್ಷಿತ ವರ್ಗದ ಆತ್ಮ ಚರಿತ್ರೆಗಳು ,

* ಮುಕ್ತ ಆಯ್ಕೆ -3 ಜಾನಪದ

3 ಕ್ರೆಡಿಟ್ 4 ಗಂಟೆಗಳು

1. ಜಾನಪದ ಸ್ವರೂಪ : ಹಾ.ಮಾ.ನಾಯಕ

ಪ್ರಥಮ ಬಿ.ಎ. (ಐಚ್ಛಿಕ ಕನ್ನಡ) ಪ್ರಥಮ ಸೆಮಿಸ್ಟರ್

1. ಪ್ರಾಚೀನ ಕನ್ನಡ ಸಾಹಿತ್ಯ ಚರಿತ್ರೆ
2. ಕನ್ನಡ ಸಾಹಿತ್ಯ ಚರಿತ್ರೆಯ ಸ್ಥೂಲ ಪರಿಚಯ - ಪೂರ್ವದ ಹಳಗನ್ನಡ ಮತ್ತು ಹಳಗನ್ನಡ

1. ಬಾದಾಮಿ ಶಾಸನ

2. ಹಂಪಿ ಶಾಸನ

II ಕವಿರಾಜ ಮಾರ್ಗದ ಆಯ್ದ ಹತ್ತು ಪದ್ಯಗಳು

III ಕಾರ್ತಿಕ ಋಷಿಯ ಕತೆ

1. ಅ . ಮಧ್ಯಕಾಲೀನ ಕನ್ನಡ ಸಾಹಿತ್ಯ ಚರಿತ್ರೆ

ಆ. ಮಧ್ಯಕಾಲೀನ ಕನ್ನಡ ಸಾಹಿತ್ಯ ಚರಿತ್ರೆಯ ಗುಣಲಕ್ಷಣಗಳು

ಇ. ಮಧ್ಯಕಾಲೀನ ಕನ್ನಡ ಸಾಹಿತ್ಯದ ರೂಪಗಳು(ವಚನ/ಕೀರ್ತನೆ/ಷಟ್ಪದಿ/ರಗಳೆ/ಸಾಂಗತ್ಯ)

ಈ. ಪ್ರಮುಖ ಮಧ್ಯಕಾಲೀನ ಕವಿಗಳು : ಅ) ಅಲ್ಲಮ ಪ್ರಭು (2 ವಚನಗಳು)

ಆ) ಅಕ್ಕಮಹಾದೇವಿ (2 ವಚನಗಳು)

ಇ) ಆಯ್ದಕ್ಕಿ ಲಕ್ಕಮ್ಮ (2 ವಚನಗಳು)

ಕೀರ್ತನೆಗಳು : 1. ಕನಕದಾಸರು

2. ಹರಪನಹಳ್ಳಿ ಭೀಮವ್ಯ

3. ನರಹರಿದಾಸರು

(ಇ) ಷಟ್ಪದಿ ಕಾವ್ಯ :

1. ಹರಿಶ್ಚಂದ್ರ ಕಾವ್ಯ : ಗಾನರಾಣಿಯರ ಪ್ರಸಂಗ

2. ಹರಿಹರನ ರಗಳೆ: ತಿರುನೀಲ ಕಂಠ ರಗಳೆ

ಸಾಂಗತ್ಯ :

1. ಭರತೇಶವೈಭವ: ಅರಗಿಳಿಯಾಳಾಪ ಸಂಧಿ

ತ್ರಿಪದಿ:

1. ಸರ್ವಜ್ಞನ ವಚನಗಳು(ಆಯ್ದ ಹತ್ತು)

ಪ್ರಥಮ ಬಿ.ಎ. (ಎರಡನೆ ಸೆಮಿಸ್ಟರ್)

1. ಆಧುನಿಕಪೂರ್ವ ಕನ್ನಡ ಸಾಹಿತ್ಯ ಚರಿತ್ರೆ

ಅ. ಆಧುನಿಕಪೂರ್ವ ಕನ್ನಡ ಸಾಹಿತ್ಯ - ಸ್ವರೂಪ, ಪ್ರೇರಣೆ, ಧೋರಣೆಗಳು.

ಆ. ಆಧುನಿಕಪೂರ್ವ ಕನ್ನಡ ಸಾಹಿತ್ಯದ ರೂಪಗಳು: ತತ್ವಪದ, ಗದ್ಯ

ಇ. ಅರುಣೋದಯ ಸಾಹಿತ್ಯ - ಪರಿಚಯ ಹಾಗೂ ಪಠ್ಯಗಳು

ಈ. ನಾಲ್ಕು ತತ್ವಪದಕಾರರ ಒಂದೊಂದು ತತ್ವಪದಗಳು

ಉ. ಮುದ್ರಾಮಂಜೂಷ ಕೃತಿಯ ಆಯ್ದ ಭಾಗ

ಊ. ರಾಮಾಶ್ವಮೇಧದ ಆಯ್ದ ಭಾಗ

ಹೆಚ್ಚಿಯಂಗಡಿ ನಾರಾಯಣರಾವ್, ಎಸ್.ಜಿ. ನರಸಿಂಹಾಚಾರ್, ಶಾಂತಕವಿಗಳು, ಬಸವಪ್ಪಶಾಸ್ತ್ರಿ, ಹೆಳವನಕಟ್ಟೆ
ಗಿರಿಯಮ್ಮ

1. ಆಧುನಿಕ ಕನ್ನಡ ಸಾಹಿತ್ಯ ಚರಿತ್ರೆ
- ಅ. ಆಧುನಿಕ ಕನ್ನಡ ಸಾಹಿತ್ಯದ ಪ್ರಮುಖ ಘಟ್ಟಗಳು
- ಆ. ನವೋದಯ
- ಇ. ಪ್ರಗತಿಶೀಲ
- ಈ. ನವ್ಯ
- ಉ. ದಲಿತ- ಬಂಡಾಯ
- ಊ. ಮಹಿಳಾ ಸಾಹಿತ್ಯ
- ಋ. ಸಮಕಾಲೀನ ಕನ್ನಡ ಸಾಹಿತ್ಯ

ಪರಾಮರ್ಶನ ಗ್ರಂಥಗಳು

1. ಕಥೆಗಳು/ಕಾದಂಬರಿಗಳ ಆಯ್ದು ಭಾಗಗಳು
2. ಕವಿತೆಗಳು - 05
3. ಲಲಿತಪ್ರಬಂಧ- 01
4. ಒಂದು ನಾಟಕ -1
5. ಅನುವಾದಗಳು- ಆಯ್ದು ಭಾಗಗಳು
6. ವೈಚಾರಿಕ ಲೇಖನಗಳು

ಕಿರು ಪರೀಕ್ಷೆ ಸಮಯ ಅಂಕಗಳು

ಮೊದಲ ಕಿರುಪರೀಕ್ಷೆ	ಪ್ರತಿ ಸೆಮಿಸ್ಟರಿನ ಎರಡನೇ ತಿಂಗಳ ಅಂತ್ಯದಲ್ಲಿ (ಒಂದು ಗಂಟೆ)	10
ಎರಡನೇ ಕಿರು ಪರೀಕ್ಷೆ	ಪ್ರತಿ ಸೆಮಿಸ್ಟರಿನ ಮೂರನೇ ತಿಂಗಳ ಅಂತ್ಯದಲ್ಲಿ (ಒಂದು ಗಂಟೆ)	10
ಎರಡು ಅಸೈನ್ಮೆಂಟ್	ಪ್ರತಿ ಅಸೈನ್ಮೆಂಟಿಗೆ 5 ಅಂಕಗಳು	10
ಸೆಮಿನಾರ್	ಪ್ರತಿ ಸೆಮಿಸ್ಟರ್‌ನಲ್ಲಿ ಒಂದು ಸೆಮಿನಾರ್- 5 ಅಂಕಗಳು	05
ಒಟ್ಟಾರೆ ಮೌಲ್ಯಮಾಪನ	ಹಾರಜಾತಿ ಸೇರಿದಂತೆ	05
	ಒಟ್ಟಾರೆ ಆಂತರಿಕ ಪರೀಕ್ಷೆಯ ಅಂಕಗಳು	40
	ಸಿದ್ಧಾಂತ ಪರೀಕ್ಷೆಯ ಅಂಕಗಳು	60
	ಒಟ್ಟಾರೆ ಅಂಕಗಳು	100

ಪ್ರೊ.ಜಿ.ಪ್ರಶಾಂತನಾಯಕ

ಅಧ್ಯಕ್ಷರು
ನ್ನಾತಕ ಕನ್ನಡ ಅಧ್ಯಯನ ಮಂಡಳಿ

KUVEMPU



UNIVERSITY

DEPARTMENT OF APPLIED BOTANY

SHANKARAGHATTA

SYLLABUS

FOR

BOTANY

I & II SEMESTER

**UNDER GRADUATE (UG)
PROGRAMME**

FRAMED ACCORDING TO

NATIONAL EDUCATION POLICY

(NEP) 2020



GOVERNMENT OF KARNATAKA

**NATIONAL EDUCATION POLICY-
2020**

(NEP-2020)

**Report on
Proposed Model Syllabus for
Four Years Graduate Programmes in
Universities of Karnataka State under NEP-
2020 in**

BOTANY

Submitted to

Department of Higher Education

Government of Karnataka,

Bengaluru

**Submission of Report on
Syllabus Framework for
04 Years Graduate
Programme in
Botany
(NEP-2020)**

Syllabus Framing Committee

SI No	Name	Designation	Signature
1.	Prof. G R Naik, Vice Chancellor, Garden City University, Bengaluru	Chairperson	
2.	Dr. A. H. Rajasab, Pro Vice Chancellor, KNB University, Kalaburagi	Member	
3.	Dr. G.R. Janardhana, Professor, University of Mysore, Mysuru	Member	
4.	Dr. H. Niranjanamurthy, Professor, Karnataka University, Dharwad	Member	
5.	Dr. L. Rajanna, Professor, Bangalore University, Bengaluru	Member	
6.	Dr. Krishna Kumar G, Professor, Mangalore University, Konaje	Member	
7.	Dr. M.B. Shivanna, Professor, Kuvempu University, Shivamogga	Member	
8.	Dr. Govindappa M, Professor, Davangere University, Davangere	Member	
9.	Dr H.Ramakrishnaiah, Registrar and Associate Professor, Maharani Cluster University, Bengaluru	Member	
10.	Shri. M. N. Mallikarjunaiah, Associate Professor, Mandya University, Mandya	Member	
11.	Shri. Rangaswamy R.K. Government Science College, Chitradurga	Member	
12.	Dr. Abdul Khayum, Associate Professor, Government Women's College, Kolar	Member	
13.	Dr. Mamtha, Associate Professor, Government First Grade College, Bengaluru	Member	
14.	Dr. Jayakara Bhandary, Associate Proessor, Government First Grade College, Mangalore	Member	

15.	Dr. R.J. Katti, Associate Professor, Kittel College Dharwad	Member	
16.	Shri L.S. Ramesh, Special Officer, Karnataka State Higher Education Council	Member Convener	

Invitees (BOS Chairperson/Subject Experts)		
1.	Prof. Vidyasagar G.M, Gulbarga University	
2.	Prof. Raja Nayak, Kuvempu University	
3.	Prof. Shobha Jagannath, Mysore University	
4.	Prof. C. Maya, Bangalore University	
5.	Prof, I S Khamer Ferzana Banu, Maharani Cluster University	
6.	Prof. Kotresh K, Karnataka University, Dharwad	
7.	Dr. Kirankumar S, Garden City University	

Index		
Sl.No.	Content	Page No
1.	Preamble	01
2.	Aims of Bachelor's Degree Programme in Botany	02
3.	B. Sc. Botany Course outcomes as per NEP	06
4.	BSc -Botany- Program Outcome	07
5.	Assessment - Teaching, Learning and Evaluation	09
6.	Curriculum Structure for the Undergraduate Degree Program -B.Sc. Botany	16
7.	Discipline Core Papers (DSC)	19
8.	Discipline Specific Elective Papers (DSE)	20
9.	Course Outcome (Cos)	21
10.	Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-12)	26
11.	Syllabus of I Semester	27
12.	Syllabus of II Semester	34
13.	Semester wise - Job Opportunities	40

Aims of Bachelor's degree programme in Botany

The broad aims of the bachelor's degree programme in Botany are:

1. To provide an environment that ensures the cognitive development of students in a holistic manner. A dialogue about plants and their significance is fostered in this framework, rather than didactic monologues on mere theoretical aspects
2. To provide the latest subject matter, both theoretical as well as practical, such a way to foster their core competency and discovery learning. A botany graduate as envisioned in this framework would be sufficiently competent in the field to undertake further discipline-specific studies, as well as to begin domain-related employment.
3. To mould a responsible citizen who is aware of the most basic domain-independent knowledge, including critical thinking and communication.
4. To enable the graduate to prepare for national as well as international competitive examinations, especially UGC-CSIR NET, and UPSC Civil Services Examination.

Program Learning Outcomes

The students graduating with the Degree B.Sc. Three years and B. Sc. (Honors) Botany should be able to acquire.

Core competency: Students will acquire core competency in the subject Botany, and allied subject areas.

1. The student will be able to identify major groups of plants and compare the characteristics of lower (e.g. algae and fungi) and higher (angiosperms and gymnosperms) plants.
2. Students will be able to use the evidence-based comparative botany approach to explain the evolution of organisms and understand the genetic diversity on the earth. The students will be able to explain various plant processes and functions, metabolism, concepts of gene, genome, and how organism's function is influenced at the cell, tissue, and organ level.

3. Students will be able to understand the adaptation, development, and behavior of different forms of life.
4. The understanding of networked life on earth and tracing the energy pyramids through nutrient flow is expected from the students.
5. Students will be able to demonstrate the experimental techniques and methods of their area of specialization in Botany.

Analytical ability:

The students will be able to demonstrate the knowledge in understanding research and addressing practical problems.

1. Application of various scientific methods to address different questions by formulating the hypothesis, data collection, and critically analyze the data to decipher the degree to which their scientific work supports their hypothesis.

Critical Thinking and problem-solving ability:

An increased understanding of fundamental concepts and their applications of scientific principles is expected at the end of this course. Students will become critical thinkers and acquire problem-solving capabilities.

Digitally equipped:

Students will acquire digital skills and integrate the fundamental concepts with modern tools.

Ethical and Psychological strengthening: Students will also strengthen their ethical and moral values and shall be able to deal with psychological weaknesses.

Team Player: Students will learn team workmanship in order to serve efficiently institutions, industry, and society.

Independent Learner: Apart from the subject-specific skills, generic skills, especially in botany, the program outcome would lead to gain knowledge and skills for further higher studies, competitive examinations, and employment. Learning outcomes-based curriculum would ensure equal academic standards across the country and a broader picture of their competencies. The Bachelor's program in Botany and Botany honors may be mono-disciplinary or multidisciplinary with following broad objectives.

1. Critically evaluation of ideas and arguments by collecting relevant information about the plants, to recognize the position of the plant in the broad classification and phylogenetic level.
2. Identify problems and independently propose solutions using creative approaches, acquired through interdisciplinary experiences, and a depth and breadth of knowledge/expertise in the field of Plant Identification.
3. Accurately interpretation of collected information and use taxonomical information to evaluate and formulate a position of the plant in taxonomy.
4. Students will be able to apply the scientific method to questions in botany by formulating testable hypotheses, collecting data that address these hypotheses, and analyzing those data to assess the degree to which their scientific work supports their hypotheses.
5. Students will be able to present scientific hypotheses and data both orally and in writing in the formats that are used by practicing scientists.
6. Students will be able to access the primary literature, identify relevant works for a particular topic, and evaluate the scientific content of these works.
7. Students will be able to apply fundamental mathematical tools (statistics, calculus) and physical principles (physics, chemistry) to the analysis of relevant biological situations.
8. Students will be able to identify the major groups of organisms with an emphasis on plants and be able to classify them within a phylogenetic framework. Students will be

able to compare and contrast the characteristics of plants, algae, and fungi that differentiate them from each other and other forms of life.

9. Students will be able to use the evidence of comparative biology to explain how the theory of evolution offers the only scientific explanation for the unity and diversity of life on earth. They will be able to use specific examples to explicate how descent with modification has shaped plant morphology, physiology, and life history.
10. Students will be able to explain the ecological interconnectedness of life on earth by tracing energy and nutrient flow through the environment. They will be able to relate the physical features of the environment to the structure of populations, communities, and ecosystems
11. Students will be able to demonstrate proficiency in the experimental techniques and methods of analysis appropriate for their area of specialization within biology.

B. Sc. Botany Course outcomes as per NEP 2020

The framework of curriculum for the Bachelor's program in Botany aims to transform the course content and pedagogy to provide a multidisciplinary, student-centric, and outcome-based, holistic education to the next generation of students.

Aside from structuring the curriculum to be more in-depth, focused, and comprehensive with significant skill-set for all exit levels; keeping in mind the job prospects; the emphasis has been to maintain academic coherence and continuum throughout the program of study and help build a strong footing in the subject, thereby ensuring a seamless transition into their careers.

Special attention is given to eliminate redundancy, discourage rote learning, and espouse a problem-solving, critical thinking, and inquisitive mindset among learners.

The curriculum embraces the philosophy that science is best learned through experiential learning, not limited to the confines of a classroom but rather through hands-on training, projects, field studies, industrial visits, and internships.

This updated syllabus, with modern technology, helps students stay informed on the leading-edge developments in plant sciences and promotes curiosity, innovation, and a passion for research, that will serve them well in their journey into scientific adventure and discovery beyond graduation.

The goal is to equip students with holistic knowledge, competencies, professional skills, and a strong positive mindset that they can leverage while navigating the current stiff challenges of the job market.

B. Sc. Botany Programme outcomes as per NEP 2020

Name of the Degree Program: B.Sc.

Discipline Core: Botany

Total Credits for the Program: 176

Starting year of implementation: 2021-22

Program Outcomes:

By the end of the program the students will be able to:

(Refer to literature on outcome based education (OBE) for details on Program Outcomes)

PO1: Skill development for the proper description using botanical terms, identification, naming and classification of life forms especially plants and microbes.

PO2: Acquisition of knowledge on structure, life cycle and life processes that exist among plant and microbial diversity through certain model organism studies.

PO3: Understanding of various interactions that exist among plants and microbes; to develop the curiosity on the dynamicity of nature.

PO4: Understanding of the major elements of variation that exist in the living world through comparative morphological and anatomical study.

PO5: Ability to explain the diversity and evolution based on the empirical evidences in morphology, anatomy, embryology, physiology, biochemistry, molecular biology and life history.

PO6: Skill development for the collection, preservation and recording of information after observation and analysis- from simple illustration to molecular database development.

PO7: Making aware of the scientific and technological advancements- Information and Communication, Biotechnology and Molecular Biology for further learning and research in all branches of Botany.

PO8: Internalization of the concept of conservation and evolution through the channel of spirit of inquiry.

PO 9: To enable the graduates to prepare for national as well as international level competitive examinations like UGC-CSIR, UPSC, KPSC etc.

PO10: To enable the students for practicing the best teaching pedagogy as a biology teacher including the latest digital modules.

PO 11: The graduates should be knowledgeable and competent enough to appropriately deliver on aspects of global importance like climate change, SDGs, green technologies etc at the right opportunity.

PO 12: The graduate should be able to demonstrate sufficient proficiency in the hands-on experimental techniques for their area of specialization within biology during research and in the professional career.

Assessment: (Teaching, Learning and Evaluation)

Weightage for assessments (in percentage)

Type of Course	Formative Assessment / IA	Summative Assessment
Theory	40	60
Practical	20	30
Projects	-	-
Experiential Learning (Internships etc.)	-	-

SUGGESTED METHODOLOGY FOR TEACHING, LEARNING AND EVALUATION

TEACHING-LEARNING

The whole programme is an Outcome Based Education. Different methods are to be used for teaching learning evaluation; in order to attain the fixed outcomes.

Theory:

Student: Review of Literature, Assignment, Presentation, e-learning, Discussion and Debate with peer group, teachers and experts.

Teacher: Lecture, Demonstration, Presentation, Discussion and Debate.

Practical:

Student: Identification, Comparison, Differentiation and Categorization of different plants and their parts by observing Permanent Slides, Hand sectioning etc., Demonstration, Experimentation, Field visit, Report Writing and Keeping records

Teacher: Demonstration, Experimentation, Field visit, Certification

Project: The finalization of the topic should be done at the beginning of the fourth semester and the list should be kept with the HOD for the perusal of the University Examination authorities. There should be at least three projects from a department. The selection of the topic and group should be student centered as far as possible. A project log book/register is to be maintained by each student and submitted along with the project report during the final submission.

Student: Suggestion of Topic, Discussion with the Project guide and Peer group, Review of Literature, Project planning and Designing, Experimentation, Data Analysis and Project Report Preparation and Presentation.

Teacher: Confirmation of Topic, Demonstration, Planning of Experimentation, Guidance and Correction and Certification.

Experiential Learning (Internships etc.):

Student should choose one of the topics for self-study from the beginning of the seventh semester. A report should be submitted by the end of Eighth Semester.

Suggested topics include: Studies on mangroves / Sacred groves / Campus flora; Cultivation of RET / Fruit / Vegetable / Medicinal plants / Mushroom; Topics related to Social responsibility- River restoration, PBR (People Biodiversity Register) preparation, Herbarium arrangement, VFC (Village Forest Committee), VNRC (Village Natural Resource Committee) formation, Landscaping and Green Auditing.

Field Study / Study Tour:

The plant diversity studies should be carried out with the support of Field Study / Study Tour. During each year there should be a field study of 1-5 days duration, with a minimum of 5 days for the completion of the programme.

EVALUATION**External Evaluation:**

External assessment by the University level examinations on specified times announced by the University for all the courses, theory, practical and Project/Viva Voce. Each student should go through the evaluation process according to the University Regulations 2021-2022

End Semester Evaluation-Theory:

The components of external evaluation and their unit wise and each theory and practical course and the time of examination will be in accordance with the calendar prepared by the University for each academic year. At the end of each semester, there will be an examination for theory courses. The duration of examinations for all theory and practical courses in Botany will be three hours, except for the Generic Elective Course papers.

External –Practical:

Practical Courses have external examination for all semester. There will be an external practical examiner and an internal examiner / skilled assistant for every practical examination of three hour duration. The external evaluation should be carried out by the team of examiners.

Sl. No.	COMPONENTS	WEIGHTAGE
1	Attendance	10
2	RECORD:	
	Scientific Accuracy	30
	Completeness	20
	Neatness and Legibility	10
3	Field Study Report/ Slide / Herbarium submitting	30

EXTERNAL – PROJECT / FIELD STUDY / VIVA VOCE

The Project/Field Study/General Viva Voce will be conducted in I/II/III/IV/V/VI/VII/ VIII Semester Practical Examination.

Viva should be based on:

Project work

Experiential Learning (Internships etc)

Field Study

General Learning Activity of four years:

For the external evaluation the components and weightage of Project/Field Study/ Viva Voce can be discussed and determined finally by the Board of Examiners; the suggested components and their weightage is given below. The project viva should be based on the Project and importance should be given to the Scientific method undertaken in that project. The general viva should be on based the changes in the outlook of the student after the learning activity of the 4 year programme, field study and Experiential Learning (Internships etc.). Time taken for each practical batch should be 3 hrs, by giving nearly 10-15 minutes for each student. The project/field study/viva voce evaluation should be conducted by external examiners and internal examiner.

Sl. No.	COMPONENTS	WEIGHTAGE
1	Attendance	10
2	PROJECT REPORT:	
	Report With All General Parts – Relevance, Objective, Methodology, Data Analysis, Discussion, Conclusion And Reference etc.	10
	Presentation Skill	30
	Viva	30
3	Field Study Report	10
4	Viva	10

ELIGIBILITY TO APPEAR FOR PRACTICAL EXAMINATION

1. 80% Attendance (All Sem.)
2. Certified Bona-fide Record (All Sem.)
3. Herbarium and Field Book (Respective Sem.)
4. Field Study Reports (Respective Sem.)
5. Certified Bona-fide Project Report (Eighth Sem.)
6. Report on Experiential Learning (Internships etc.) (Eighth Sem.)

CONTINUOUS INTERNAL EVALUATION

Internal evaluation is a continuous evaluation in all types of courses- theory/ practical / Project / Field study. The teacher has flexibility in deciding the components and their weightage in accordance with the University Regulations, 2021-22. Internal evaluation should be very

transparent to the students and the components and relative weightage should be announced at the beginning of each learning activity by the concerned teacher. Internal evaluation should be published in the notice board, one week before the closure of each semester.

INTERNAL –THEORY

The percentile system can be adopted for calculating the internal component, test paper.

Sl. No.	COMPONENTS	WEIGHTAGE
1	Attendance	10
	Test Papers	40
2	Assignment	20
	Seminar	20
	Viva	10

INTERNAL – PRACTICAL

The internal evaluation may be regular internal assessment on hourly basis or unit wise, whichever is communicated with the student.

Sl. No.	COMPONENTS	WEIGHTAGE
1	Regularity	25
2	Practical Skill- (Sectioning, Drawing, Labeling, Record Keeping Etc)	50
3	Regular Viva/Model Examination	25

INTERNAL - PROJECT/FIELD STUDY/VIVA VOCE

Internal evaluation of the project should start with the beginning of the project and can be finalized by the project viva.

Sl. No.	COMPONENTS	WEIGHTAGE
1	Participation	50
2	Viva	25
3	Field Study and other Assignment Reports	25

Curriculum Structure for the Undergraduate Degree Program

B.Sc. BOTANY

Total Credits for the Program: 176

Starting year of implementation: 2021-22

Name of the Degree Program: B.Sc.

Discipline/Subject: BOTANY

Program Articulation Matrix:

This matrix lists only the core courses. Core courses are essential to earn the degree in that discipline/subject. They include courses such as theory, laboratory, project, internships etc. Elective courses may be listed separately.

Semester	Title / Name Of the course	Program outcomes that the course addresses (not more than 3 per course)	Pre-requisite course(s)	Pedagogy##	Assessment\$
1	BOT A1 Microbial Diversity and Technology	PO1	---	Ex. MOOC Desk Work	Quiz
2	BOT A2 Diversity of Nonflowering Plants	PO2, PO3	BOT A1	Problem solving,	Debate
3	BOT A3 Plant Anatomy and	PO4, PO5	BOT A1 and A2		

	Developmental Biology			Book Chapter	Class work Class work Seminar Project writing Articles writing, Interpretation of results
4	BOT A4 Ecology and Conservation Biology	PO4, PO5	BOT A1 A2 A3	Seminar,	
5.	BOT A5 Plant Taxonomy and Resource Botany	PO6, PO7	BOT A1 A2 A3	Project based learning,	
	BOT A6 Cell Biology and Genetics	PO6, PO7	BOT A6 A1 A2 A3 A4 A5		
6.	BOT A7 Plant Physiology and Biochemistry	PO6, PO7, PO9	BOT A5	Term paper Assignment,	
	BOT A8 Plant Biotechnology	PO8. PO9	BOT A5	Group Discussion	
7.	BOT A9 Molecular Biology	PO8, PO9	BOT A6 A8	Research Project	
	BOT A10 Seed Biology and Seed Technology	PO9, PO10	BOT A5 A8 A9	Instrumentation	
	BOT A11 Plant Health Technology	PO9, PO10	BOT A5 A4 A8		

8.	BOT A12 Medicinal Plants and Phytochemistry	PO9, PO10	BOT A4 A5 A7 A8		
	BOT A13 Biochemistry and Computational Biology	PO9, PO10	BOT A5 A8 A9		
	BOT A14 Research Methodology	PO9, PO10	BOT A13		

Pedagogy for student engagement is predominantly lectures. However, other pedagogies enhancing better student engagement to be recommended for each course. The list includes active learning/ course projects/ problem or project based learning/ case studies/self-study like seminar, term paper or MOOC

\$ Every course needs to include assessment for higher order thinking skills (Applying/ Analyzing/ Evaluating/ Creating). However, this column may contain alternate assessment methods that help formative assessment (i.e. assessment for learning).

Semester I and II

Course Title: B.Sc. BOTANY	
Total Contact Hours: 56	Course Credits:06
Formative Assessment Marks: 40	Duration of ESA/Exam: 3hrs
Model Syllabus Authors: Dr. G.R.NAIK AND TEAM	Summative Assessment Marks: 60

Course Pre-requisite(s): Mention only course titles from the curriculum that are needed to be taken by the students before registering for this course.

DISCIPLINE CORE PAPERS (DSC)

Sl. No.	Semester Details	Subject	Paper No
1	Semester I	Microbial Diversity and Technology	A-1
2	Semester II	Diversity and Conservation of Non Flowering Plants	A-2
3	Semester III	Plant Anatomy and Development Biology	A-3
4	Semester IV	Ecology and Conservation Biology	A-4
5	Semester V	Plant taxonomy and Resource Botany	A-5
		Genetics and Cell Biology	A-6
6	Semester VI	Plant Physiology and Biochemistry	A-7
		Plant Biotechnology	A-8
7	Semester VII	Molecular Biology	A-9
		Seed Biology and Seed Technology	A-10
		Plant Health Technology	A-11
8	Semester VIII	Medicinal Plants and Phytochemistry	A-12
		Bioinformatics and Computational Biology	A-13
		Research Methodology	A-14

CORESPECIFIC ELECTIVE PAPERS (DSE)

SI No.	Semester Details	Subject: Botany	Credits	Paper No
1	Semester V	DSE 1: Algal and Fungal Biotechnology	03	E-1
2	Semester VI	DSE 2: Herbal Technology	03	E-2
3	Semester VII	DSE 3: Plant Propagation and Tissue Culture	03	E-3
4	Semester VIII	DSE 4: Landscaping, Gardening and Green House Technology	03	E-4

BOTANY COURSE OUTCOMES (COs):

At the end of the course the student should be able to:

(Write 3-7 course outcomes. Course outcomes are statements of observable student actions that serve as evidence of knowledge, skills and values acquired in this course)

Semester I (A-1): Microbial Diversity and Technology

1. Understand the fascinating diversity, evolution, and significance of microorganisms.
2. Comprehend the systematic position, structure, physiology and life cycles of microbes and their impact on humans and environment.
3. Gain laboratory skills such as microscopy, microbial cultures, staining, identification, preservation of microbes for their applications in research and industry.

Semester II (A-2): Diversity of Non- Flowering Plants

1. Understand the diversity and affinities among Algae, Bryophytes, Pteridophytes and Gymnosperms.
2. Understand the morphology, anatomy, reproduction and life cycle across Algae, Bryophytes, Pteridophytes and Gymnosperms, and their ecological and evolutionary significance.
3. Obtain laboratory skills/explore non-flowering plants for their commercial applications.

Semester III (A-3): Plant Anatomy and Developmental Biology

1. Observation of variations that exist in internal structure of various parts of a plant and as well as among different plant groups in support for the evolutionary concept.

2. Skill development for the proper description of internal structure using botanical terms, their identification and further classification.
3. Understanding the basic concepts in plant morphogenesis, embryology and organ development.

Semester IV (A-4): Ecology & Conservation Biology

1. Understanding the fundamental concepts in ecology, environmental science and phytogeography.
2. Concept development in conservation, global ecological crisis, Sustainable development and pros and cons of human intervention.
3. Enable the student to appreciate bio diversity and the importance of various conservation strategies, laws and regulatory authorities and global issues related to climate change and sustainable development.

Semester V (A-5): Plant Taxonomy & Resource Botany

1. Ability to identify, classify and describe the plants in scientific terms. Identification of plants using dichotomous keys.
2. Recognition, processing and utilization of economically important plants.
3. Skill development in processing of biomass and plant products as source of food, healthcare, energy and natural products.

Semester V (A-6): Cell Biology & Genetics

1. Identify the basic principles and current trends in classical genetics and Cell biology.
2. Recognize the historical process of the evolution of molecular genetics from classical genetics.

3. Develop theoretical background on molecular genetics to provide a strong support for the student for future research and employability.

Semester VI (A-7): Plant Physiology & Biochemistry

1. Preliminary understanding of the basic functions and intermediary metabolism in a plant body.
2. Awareness on the interdisciplinary nature of botany, chemistry and physics by studying the principles of plant life, growth and reproduction.
3. Recognizing the wonderful mechanism of transport and the Interrelationships existing between metabolic pathways thereby gaining an idea about the importance of plants in the dynamicity of nature.

Semester VI (A-8): Plant Biotechnology

1. Learning of knowledge & skill in plant tissue culture, plant molecular biology and transgenic.
2. Application of plant biotechnology in plant genomics, phylogenetic studies and metabolic engineering.
3. Understanding of new molecular techniques in cell and metabolic manipulations.

Semester VII (A-9): Molecular Biology

1. Understanding the mechanism and concepts of life process at molecular level through central dogma concept.
2. Skill acquiring in the basic molecular biology techniques & characterization of micro-molecules.
3. Acquiring the emerging technology skills in plant genetic engineering & proteomics.

Semester VII (A-10): Seed Biology & Seed Technology

1. Understanding the seed structure and related functions, seed health and productivity.
2. Technology for assessing the seed pathology, purity, and preservation.
3. Learning the field and laboratory protocols of seed production, certification and quality.

Semester VII (A-11): Plant Health Technology

1. Understanding & learning common diseases & control measures of plant diseases.
2. Acquiring skills in plant disease diagnosis, control & management through IPM.
3. Learning of new skills in health clinic through biological methods.

Semester VIII (A-13): Medicinal Plants & Phytochemistry

1. Knowledge of Indian system of medicine with regard to medicinal plants.
2. Acquiring skills in identification, cultivation and preservation of medicinal plants.
3. Isolation, identification, characteristics of active principles in medicinal plants & drug formulations.

Semester VIII (A-14): Bioinformatics & Computational Biology

1. Learning of basic principles of application, ICT Technology in biological studies & research.
2. Acquiring skill to utilize the computational apps, active data basis and tools in analysis in genetics & proteomics.
3. Learning skills and software used for biological research & process understanding.

Semester VIII (A-15): Research Methodology

1. Understanding the working of science for further application in free, independent, individual needs and in designing scientific experimentation.
2. Acquire knowledge on the principles, components and applications of various scientific equipment in biology.
3. Foundation knowledge in the basic concepts, components and functions of informatics and the importance of statistical principles in biological research.

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-12)

SEMENAR	Course Outcomes (COs) / Program Outcomes (POs)	1	2	3	4	5	6	7	8	9	10	11	12
1	A-1	X	X	X			X			X			X
2	A-2	X	X	X			X		X	X			X
3	A-3		X	X	X	X		X		X			X
4	A-4			X		X	X	X	X	X	X	X	X
5	A-5, A-6	X	X	X	X	X		X	X	X	X	X	X
6	A-7, A-8					X		X		X		X	X
7	A-9, A-10, A-11					X	X	X		X	X	X	X
8	A-12A-13, A-14,					X	X	X	X	X	X	X	X

Course Articulation Matrix relates course outcomes of course with the corresponding program outcomes whose attainment is attempted in this course. Mark 'X' in the intersection cell if a course outcome addresses a particular program outcome.

B.Sc. BOTANY: Semester - 1

Title of the Course: Microbial Diversity and Technology

Number of Theory Credits	Number of lecture hours/semester	Number of practical Credits	Number of practical hours / semester
4	56	2	56
Content of Theory Course 1			56 Hrs
Unit –1			15
<p>Chapter No. 1: Microbial diversity-Introduction to microbial diversity; Methods of estimation; Hierarchical organization and positions of microbes in the living world. Whittaker’s five-kingdom system and Carl Richard Woese’s three-domain system. Distribution of microbes in soil, air, food and water. Significance of microbial diversity in nature.</p>			5
<p>Chapter No. 2 History and developments of microbiology-Microbiologists and their contributions (Leeuwenhoek, Louis Pasteur, Robert Koch, Joseph Lister, Dmitri Iwanowski, Sergius Winogradsky and M W Beijerinck and Paul Ehrlich).</p>			5
<p>Chapter No. 3 Microscopy-Working principle and applications of light, dark field, phase contrast and electron microscopes (SEM and TEM). Microbiological stains (acidic, basic and special) and Principles of staining. Simple, Gram’s and differential staining.</p>			5

Unit – 2	15
Chapter No. 4. Culture media for Microbes- Natural and synthetic media, Routine media -basal media, enriched media, selective media, indicator media, transport media, and storage media.	5
Chapter No. 5. Sterilization methods -Principle of disinfection, antiseptic, tyndallisation and Pasteurization, Sterilization -Sterilization by dry heat, moist heat, UV light, ionization radiation, filtration. Chemical methods of sterilization-phenolic compounds, anionic and cationic detergents.	5
Chapter No. 6. Microbial Growth -Microbial growth and measurement. Nutritional types of Microbes- autotrophs and heterotrophs, phototrophs and chemotrophs; lithotrophs and organotrophs.	5
Unit – 3	11
Chapter No. 7 Microbial cultures and preservation -Microbial cultures. Pure culture and axenic cultures, sub culturing, Preservation methods-overlaying cultures with mineral oils, lyophilisation. Microbial culture collections and their importance. A brief account on ITCC, MTCC and ATCC.	5
Chapter No. 8. Viruses- General structure and classification of Viruses; ICTV system of classification. Structure and multiplication of TMV, SARS-COV-2, and Bacteriophage (T2). Cultivation of viruses. Vaccines and types.	4
Chapter No. 9. Viroids- general characteristics and structure of Potato Spindle	2

Tuber Viroid (PSTVd); Prions - general characters and Prion diseases. Economic Importance of viruses.	
Unit – 4	15
Chapter No. 10. Bacteria- General characteristics and classification. Archaeobacteria and Eubacteria. Ultrastructure of Bacteria; Bacterial growth and nutrition. Reproduction in bacteria- asexual and sexual methods. Study of <i>Rhizobium</i> and its applications. A brief account of Actinomycetes and Cyanobacteria. Mycoplasmas and Phytoplasmas- General characteristics and diseases. Economic importance of Bacteria.	5
Chapter No. 11. Fungi- General characteristics and classification. Thallus organization and nutrition in fungi. Reproduction in fungi (asexual and sexual). Heterothallism and parasexuality. Type study of <i>Phytophthora</i> , <i>Rhizopus</i> , <i>Neurospora</i> , <i>Puccinia</i> , <i>Penicillium</i> and <i>Trichoderma</i> .	5
Chapter No. 12. Lichens – Structure and reproduction. VAM Fungi and their significance. Fungal diseases -Late Blight of Potato, Black stem rust of wheat; Downy Mildew of Bajra, Grain smut of Sorghum, Sandal Spike, Citrus Canker, Root Knot Disease of Mulberry. Economic importance of Fungi.	5

Text Books

1. Ananthnarayan R and Panikar JCK. 1986. Text book of Microbiology. Orient Longman Ltd. New Delhi.
2. Arora DR. 2004. Textbook of Microbiology, CBS, NewDelhi.

3. William CG. 1989. Understanding microbes. A laboratory text book for Microbiology. W.H. Freeman and Company. New York.
4. Dubey RC and Maheshwari DK. 2007. A textbook of Microbiology, S. Chand and Company, NewDelhi.
5. Dubey RC and Maheshwari DK. 2002. A Text book of Microbiology, S.C.Chand and Company, Ltd. Ramnagar, New Delhi.
6. Sharma R. 2006. Text book of Microbiology. Mittal Publications. New Delhi. 305pp.
7. Sharma PD. 1999. Microbiology and Plant Pathology. Rastogi publications. Meerut, India.
8. Vasanthkumari R. 2007. A textbook of Microbiology, BI Publications Pvt. Ltd., New Delhi.

References

1. Alexepoulos CJ and Mims CW. 1989. Introductory Mycology, Wiley Eastern Ltd., NewDelhi.
2. Allas RM. 1988. Microbiology: Fundamentals and Applications, Macmillan publishing co. New York.
3. Brook TD, Smith DW and Madigan MT. 1984. Biology of Microorganisms, 4th ed. Eaglewood Cliffts. N.J.Prentice- Hall. New Delhi.
4. Burnell JH and Trinci APJ. 1979. Fungal walls and hyphal growth, Cambridge University Press. Cambridge.
5. Jayaraman J. 1985. Laboratory Manual of Biochemistry, Wiley Eastern Limited. New Delhi.
6. Ketchum PA. 1988. Microbiology, concepts and applications. John Wiley and Sons. New York.
7. Michel J, Pelczar Jr.EC and Krieg CR. 2005. Microbiology, Mc.Graw-Hill, New Delhi.
8. Powar CB and Daginawala. 1991. General Microbiology, Vol – I and Vol – II Himalaya publishing house,Bombay.
9. Reddy S and Ram. 2007. Microbial Physiology. Scientific Publishers, Jodhpur, 385pp.
10. Sullia SB and Shantharam S. 1998. General Microbiology. Oxford and IBH publishing Co.Pvt.Ltd. New Delhi.
11. Schlegel HG. 1986. General Microbiology. Cambridge. University Press.London, 587pp.

12. Roger S, Ingrahan Y, Wheelis JL, Mark L and Page PR. 1990. Microbial World 5th edition. Prentice-Hall India, Pvt. Ltd. New Delhi.

13. Sullia SB. And Shantharam S. 2005. General Microbiology, Oxford and IBH, NewDelhi.

Pedagogy:

Lectures, Practicals, Field and laboratory visits, Participatory Learning, Seminars, Assignments, specimen submission etc

Scheme of Formative Assessment-Theory	
Assessment Occasion/ type	Weightage in Marks
ATTENDANCE	10
I TEST	10
II TEST	10
ASSIGNMENT/SEMINAR	10
Total	40

Date

Course Co-ordinator

Subject Committee Chairperson

Content of Practical Course 1: List of Experiments to be conducted

Practical 1: Safety measures in microbiology laboratory and study of equipment/appliances used for microbiological studies (Microscopes, Hot air oven, Autoclave/Pressure Cooker, Inoculation needles/loop, Petri plates, Incubator, Laminar flow hood, Colony counter, Haemocytometer, Micrometer etc.).

Practical 2: Enumeration of soil/food /seed microorganisms by serial dilution technique.

Practical 3: Preparation of culture media (NA/PDA) sterilization, inoculation, incubation of *E coli* / *B. subtilis*/ Fungi and study of cultural characteristics.

Practical 4: Determination of cell count by using Haemocytometer and determination of microbial cell dimension by using Micrometer.

Practical 6: Simple staining of bacteria (Crystal violet /Nigrosine blue) / Gram's staining of bacteria.

Practical 7: Isolation and study of morphology of *Rhizobium* from root nodules of legumes

Practical 8: Preparation of spawn and cultivation of paddy straw (Oyster) mushroom.

Practical 9: Study of vegetative structures and reproductive structures - *Albugo*, *Phytophthora/Pythium*, *Rhizopus/Mucor*, *Saccharomyces*, *Neurospora/ Sordaria*, *Puccinia*, *Agaricus*, *Lycoperdon*, *Aspergillus/Penicillium*, *Trichoderma*.
(Depending on local availability)

Practical 10: Preparation of agar slants, inoculation, incubation, pure culturing and preservation of microbes by oil overlaying.

Practical 11: Study of late blight of Potato, Downy mildew of Bajra, Citrus canker, Tobacco mosaic disease, Sandal spike disease.

Practical 12: Study of well-known microbiologists and their contributions through charts and photographs.

Practical-13: Visit to water purification units/Composting/ microbiology labs/dairy and farms to understand role of microbes in day today life.

(Note: Botanical study tour to a floristic rich area for 1-2 days and submission of study report is compulsory)

Scheme of Formative Assessment-Practical

Assessment Occasion/ type	Weightage in Marks
PRACTICAL TEST	10
ASSIGNMENT/REPORT SUBMISSION	05
PARTICIPATION/CLASS PERFORMANCE	05
Total	20

Date**Course Co-ordinator****Subject Committee Chairperson**

BOTANY: Open Elective Course (OE-1) I Semester

OE-1.1: PLANTS AND HUMAN WELFARE

Course Outcome:

On completion of this course, the students will be able to

1. To make the students familiar with economic importance of diverse plants that offer resources to human life.
2. To make the students known about the plants used as-food, medicinal value and also plantsource of different economic value.
3. To generate interest amongst the students on plants importance in day today life, conservation, ecosystem and sustainability.

Number of Theory Credits	Number of lecture hours/semester	Number of practical Credits	Number of practical hours / semester
3	39	0	00
Content of Theory Course OE-1.1: PLANTS AND HUMAN WELFARE			39 Hrs
Unit I			13
<p>Origin of Cultivated Plants. Concept of Centres of Origin, their importance with reference to Vavilov's work. Examples of major plant introductions. Crop domestication and loss of genetic diversity (Only conventional plant breeding methods). Importance of plant bio-diversity and conservation.</p> <p>Cereals: Wheat and Rice (origin, evolution, morphology, post-harvest processing & uses). Green revolution. Brief account of millets and their nutritional importance.</p> <p>Legumes: General account (including chief pulses grown in Karnataka- red gram, green gram, chick pea, soybean). Importance to man and ecosystem.</p>			3
Unit II			13
<p>Cash crops: Morphology, new varieties and processing of sugarcane, products and by-products of sugarcane industry. Natural Rubber –cultivation, tapping and processing.</p> <p>Spices: Listing of important spices, their family and parts used, economic importance with special reference to Karnataka. Study of fennel, clove, black pepper and cardamom</p> <p>Fruits: Mango, grapes and Citrus (Origin, morphology, cultivation, processing and uses)</p> <p>Beverages: Tea, Coffee (morphology, processing & uses)</p>			

UNIT II	13
<p>Oils and fats: General description, classification, extraction, their uses and health implications; groundnut, coconut, sunflower and mustard (Botanical name, family & uses). Non edible oil yielding trees and importance as biofuel. Neem oil and applications.</p> <p>Essential Oils: General account. Extraction methods of sandal wood oil, rosa oil and eucalyptus oil. Economic importance as medicine, perfumes and insect repellents.</p> <p>Drug-yielding plants: Therapeutic and habit-forming drugs with special reference to <i>Cinchona</i>, <i>Digitalis</i>, <i>Aloe vera</i> and <i>Cannabis</i>.</p> <p>Fibers: Classification based on the origin of fibers; Cotton and jute (origin morphology, processing and uses).</p>	

Text Books and References

1. Kochhar, S.L. (2012). Economic Botany in Tropics. New Delhi, India: MacMillan & Co.
2. Wickens, G.E. (2001). Economic Botany: Principles & Practices. The Netherlands: Kluwer Academic Publishers.
3. Chrispeels, M.J. and Sadava, D.E. (1994) Plants, Genes and Agriculture. Jones & Bartlett - Publishers.

Pedagogy:

Lectures, Practicals, Field and laboratory visits, Participatory Learning, Seminars, Assignments, specimen submission etc

Assessment Occasion / type	Weightage in Marks
Formative Assessment / IA	40
Summative Assessment / ESE	60
Total	100

Scheme of Formative Assessment-Theory	
Assessment Occasion / type	Weightage in Marks
ATTENDANCE	10
I TEST	10
II TEST	10
ASSIGNMENT/SEMINAR	10
Total	40

Date

Course Co-ordinator

Subject Committee Chairperson

B.Sc. BOTANY: Semester – 2

Title of the Course: Diversity of Non- Flowering Plants

Number of Theory Credits	Number of lecture hours/semester	Number of practical Credits	Number of practical hours/semester
4	56	2	56
Content of Theory Course 2			56 Hrs
Unit –1			15
<p>Chapter No. 1 Algae –Introduction and historical development in algology. General characteristics and classification of algae, Diversity- habitat, thallus organization, pigments, reserve food, flagella types, life-cycle and alternation of generation in Algae. Distribution of Algae.</p>			5
<p>Chapter No. 2 Morphology and reproduction and life-cycles of <i>Nostoc</i>, <i>Oedogonium</i>, <i>Chara</i>, <i>Sargassum</i> and <i>Batrachospermum</i>. Diatoms and their importance. Blue-green algae-A general account. Algalblooms and toxins.</p>			5
<p>Chapter No. 3 Algal cultivation- Cultivation of microalgae-<i>Spirulina</i> and <i>Dunaliella</i>; Algal cultivation methods in India. Algal products- Food and Nutraceuticals, Feed stocks, food colorants; fertilizers, aquaculture feed; therapeutics and cosmetics; medicines; dietary fibres from algae and uses.</p>			5
Unit – 2			15

Chapter No. 4. Bryophytes – General characteristics and classification of Bryophytes, Diversity-habitat, thallus structure, Gametophytes and sporophytes.	5
Chapter No. 5 Distribution, morphology, anatomy, reproduction and life-cycles of <i>Riccia</i> , <i>Anthoceros</i> , and <i>Funaria</i> . Ecological and economic importance of Bryophytes. Fossil Bryophytes.	5
Chapter No. 6. . Pteridophytes- General characteristics and classification; Structure of sporophytes and life-cycles. Distribution, morphology, anatomy, reproduction and life-cycles in <i>Selaginella</i> , <i>Equisetum</i> , <i>Pteris</i> and <i>Salvinia</i> .	5
Unit – 3	15
Chapter No. 7 A brief account of heterospory and seed habit. Stelar evolution in Pterodophytes. Affinities and evolutionary significance of Pteridophytes. Ecological and economic importance.	5
Chapter No. 8. Gymnosperms- General characteristics. Distribution and classification of Gymnosperms. Study of the habitat, distribution, habit, anatomy, reproduction and life-cycles in <i>Cycas</i> , <i>Pinus</i> and <i>Gnetum</i> .	5
Chapter No. 9. Affinities and evolutionary significance of Gymnosperms. Economic importance of Gymnosperms - food, timber, industrial uses and medicines.	5
Unit – 4	11

Chapter No. 10. Origin and evolution of Plants: Origin and evolution of plants through Geological Time scale.	2
Chapter No. 11. Paleobotany- Paleobotanical records, plant fossils, Preservation of plant fossils - impressions, compressions, petrification's, moulds and casts, pith casts. Radiocarbon dating.	5
Chapter No. 12. Fossil taxa- <i>Rhynia</i> , <i>Lepidodendron</i> , <i>Lepidocarpon</i> , <i>Lyginopteris</i> and <i>Cycadeoidea</i> . Exploration of fossil fuels. Birbal Sahni Institute of Paleosciences.	4

Text Books

- 1) Chopra, G.L. A text book of Algae. Rastogi & Co., Meerut, Co., New Delhi, Depot. Allahabad.
- 2) Johri, Lata and Tyagi, 2012, A Text Book of, Vedam e Books, New Delhi.
- 3) Sharma, O.P. 1990. Text Book of Pteridophyta. McMillan India Ltd. New Delhi.
- 4) Sharma, O.P. 1992. Text Book of Thallophytes. McGraw Hill Publishing Co. New Delhi.
- 5) Sharma, O.P., 2017, Algae Singh-Pande-Jain 2004-05. A Text Book of Botany. Rastogi Publication, Meerut.

References

1. Sambamurty, A.V.S.S.. A Text Book of Algae. I.K. International Private Ltd., New Delhi.
2. Agashe, S.N. 1995. Paleobotany. Plants of the past, their evolution, paleoenvironment and Allied plants. Hutchinson & Co., Ltd., London.
3. Anderson R.A. 2005, Algal cultural Techniques, Elsevier, London.
4. Publication, Application in exploration of fossil fuels. Oxford & IBH., New Delhi.
5. Eams, A.J., (1974) Morphology of vascular plants - Lower groups. Tata Mc Grew-Hill Publishing Co. New Delhi, Freeman & Co., New York.
6. Fritze, R.E. 1977. Structure and reproduction of Algae. Cambridge University Press.
7. Goffinet B and Shaw A.J. 2009, Bryophyte Biology, 2nd ed. Cambridge University Press, Cambridge. Gymnosperms.

8. Srivastava, H N, 2003. Algae Pradeep Publication, Jalandhar, India.
9. Kakkar, R.K. and B.R.Kakkar (1995) The Gymnosperms (Fossils and Living) Central Publishing House, Allahabad.
10. Kumar H. D., 1999, Introductory Phycology, Affiliated East-West Press, Delhi.
11. Lee, R.E., 2008, Phycology, Cambridge University Press, Cambridge. 4th edition. McGraw Hill Publishing Co., New Delhi.
12. Parihar, N.S. 1970. An Introduction to Embryophyta. Vol. I. Bryophyta. Central Book, Allahabad.
13. Parihar, N.S. (1976) An Introduction to Pteridophytes, Central Book Depot, Allahabad.
14. Parihar, N.S. 1977. The Morphology of Pteridophytes. Central Book Depot., Allahabad. Press, Cambridge.
15. Rashid, A. 1998. An Introduction to Pteridophyta. II ed., Vikas Publishing House, New Delhi.
16. Smith, G.M. 1971. Cryptogamic Botany. Vol. II. Bryophytes & Pteridophytes. Tata Tata McGraw Hill Publishing, New Delhi.
17. Smith, G.M. 1971. Cryptogamic Botany. Vol. I Algae & Fungi. Tata McGraw Hill Publishing. New Delhi.
18. Sporne, K.R. 1965. The Morphology of Gymnosperms. Hutchinson & Co., Ltd., London.
19. Stewart, W .M. 1983. Paleobotany and the Evolution of Plants, Cambridge University Cambridge.
20. Sundarajan, S. 1997. College Botany Vol. I. S Chand & Co. Ltd., New Delhi.
21. Vanderpoorten, A. and Goffinet, B. 2009, Introduction to Bryophytes, Cambridge University Press, Cambridge.
22. Vashista, B.R. 1978. Bryophytes. S Chand & Co. Ltd., New Delhi.

Pedagogy:

Lectures, Practicals, Field and laboratory visits, participatory learning, seminars, assignments, MOOCs and specimen preparation and submission.

Scheme of Formative Assessment-Theory

Assessment Occasion/ type	Weightage in Marks
ATTENDANCE	10
I TEST	10
II TEST	10
ASSIGNMENT/SEMINAR	10
Total	40

Date**Course Co-ordinator****Subject Committee Chairperson**

Content of Practical Course 2: List of Experiments to be conducted

Practical-1: Study of morphology, classification, reproduction and lifecycle of *Nostoc/Oscillatoria*.

Practical-2: Study of morphology, classification, reproduction and life-cycle of *Oedogonium* & *Chara, Sargassum, Batrachospermum/ Polysiphonia*.

Practical-3: Study of morphology, classification, reproduction and life-cycle of *Riccia* & *Anthoceros*.

Practical-4: Study of morphology, classification, anatomy, reproduction and life-cycle of *Selaginella and Equisetum*.

Practical -5: Study of morphology, classification, anatomy, reproduction and life-cycle of *Pteris, Azolla*..

Practical -6: Study of morphology, classification, anatomy and reproduction in *Cycas*.

Practical -7: Study of morphology, classification & anatomy, reproduction in *Pinus*.

Practical -8: Study of morphology, classification & anatomy, reproduction in *Gnetum*.

Practical -9: Study of important blue green algae causing water blooms in the lakes.

Practical -10: Study of different methods of cultivation of ferns in a nursery.

Practical -11: Preparation of natural media and cultivation of *Azolla* in artificial ponds.

Practical -12: Media preparation and cultivation of *Spirulina*.

Practical -13: Study different algal products and fossils impressions and slides.

Practical-14: Visit to algal cultivation units/lakes with algal blooms/Fern house/ Nurseries/Geology museum/lab to study plant fossils.

(Note: Botanical study tour to a floristic rich area for 1-2 days and submission of study report is compulsory)

Pedagogy:

Lectures, Practicals, Field and laboratory visits, Participatory Learning, Seminars, Assignments, specimen submission etc

Scheme of Formative Assessment-Practical	
Assessment Occasion/ type	Weightage in Marks
PRACTICAL TEST	10
ASSIGNMENT/REPORT SUBMISSION	05
PARTICIPATION/CLASS PERFORMANCE	05
Total	20

Date

Course Co-ordinator

Subject Committee Chairperson

Open Elective Course (OE-2)

II Semester

OE-2.1: PLANT PROPAGATION, NURSERY MANAGEMENT AND GARDENING

Paper Outcome:

On completion of this course, the students will be able to

1. To gain knowledge of gardening, cultivation, multiplication, raising of seedlings of garden plants.
2. To get knowledge of new and modern techniques of plant propagation.
3. To develop interest in nature and plant life.

Number of Theory Credits	Number of lecture hours/semester	Number of practical Credits	Number of practical hours / semester
3	39	0	0
Content of Theory Course OE-2.1: PLANT PROPAGATION, NURSERY MANAGEMENT AND GARDENING			39 Hrs
Unit I: Nursery and Vegetative propagation			13
<p>Nursery: Definition, objectives and scope and general practices and building up of infrastructure for nursery, planning and seasonal activities. Planting - direct seeding and transplants, Soil free/soilless/ synthetic growth mediums for pots and nursery.</p> <p>Vegetative propagation: Air-layering, cutting, selection of cutting, collecting season, treatment of cutting, rooting medium and planting of cuttings. Hardening of plants .Green house, mist chamber, shed root, shade house and glass house.</p>			
Unit II: Gardening			13
<p>Definition, objectives and scope. Different types of gardening - landscape and home/terrace gardening, parks and its components. Plant materials and design. Computer applications in landscaping, Gardening operations: soil laying, manuring, watering, management of pests and diseases and harvesting.</p>			
Unit II: Seed, Sowing/raising of seeds and seedlings			13
<p>Structure and types - Seed dormancy; causes and methods of breaking dormancy. Seed storage: Seed banks, factors affecting seed viability, genetic erosion Seed production technology. Seed testing and certification.</p>			

Transplanting of seedlings - Study of cultivation of different vegetables and flowering plants: cabbage, brinjal, lady's finger, tomatoes, carrots, bougainvillea, roses, geranium, ferns, petunia, orchids etc. Storage and marketing procedures. Developing and maintenance of different types of lawns. Bonsai technique.	
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Text Books and References

1. Agrawal, P.K. (1993). Hand Book of Seed Technology. New Delhi, Delhi: Dept. of Agriculture and Cooperation, National Seed Corporation Ltd.
2. Bose T.K., Mukherjee, D. (1972). Gardening in India. New Delhi, Delhi: Oxford & IBH PublishingCo.
3. Jules, J. (1979). Horticultural Science, 3rd edition. San Francisco, California: W.H. Freeman and Co.
4. Kumar, N. (1997). Introduction to Horticulture. Nagercoil, Tamil Nadu: Rajalakshmi Publications.
5. Musser E., Andres. (2005). Fundamentals of Horticulture. New Delhi, Delhi: McGraw Hill Book Co.
6. Sandhu, M.K. (1989). Plant Propagation. Madras, Bangalore: Wile Eastern Ltd.

Pedagogy:

Lectures, Practicals, Field and laboratory visits, Participatory Learning, Seminars, Assignments, specimen submission etc

Assessment Occasion / type	Weightage in Marks
Formative Assessment / IA	40
Summative Assessment / ESE	60
Total	100

Scheme of Formative Assessment-Theory	
Assessment Occasion / type	Weightage in Marks
ATTENDANCE	10
I TEST	10
II TEST	10
ASSIGNMENT/SEMINAR	10
Total	40

Date

Course Co-ordinator

Subject Committee Chairperson

Job opportunities in Botany

Exit After ONE Year: Certificate Course

I Sem. - A1: Microbial Diversity and Technology

II Sem. – A2: Diversity and Conservation of Non- Flowering plants

Job opportunities in Botany

- Preparation of algal, fungal microbial, bryophyte, pteridophyte, and gymnosperm slides for educational institutions and other line departments (Entrepreneurship).
- Providing algal, fungal microbial, bryophyte, pteridophyte, and gymnosperm materials for educational institutions and other line departments (Entrepreneurship).
- Developing Nursery (Entrepreneurship).
- Nursery supervisor/manager
- Mushroom cultivation (Entrepreneurship).
- Cyanobacterial, algal and microbial culture (Entrepreneurship).
- Fermentation industries. Dairy farming industries. Dairy products industries. Spice Industries (Lichens)
- Quarantine dept., Quality control/analyst, packaging, Lab. assistant

Job opportunities in Botany

Exit After **TWO** Year: **Diploma Course**

III Semester- A3: Plant Anatomy and Developmental Biology

IV Semester- A4: Ecology and Conservation Biology

Job opportunities in Botany

In Addition to one year certificate

- Preparation of Anatomy embryology and Ecological slides for educational institutions and other line departments (Entrepreneurship).
- Providing Anatomy embryology and Ecological materials for educational institutions and other line departments (Entrepreneurship).
- Lab technician
- Garden / nursery supervisor
- Developing his/her own nursery (Entrepreneurship).
- Forest guard, Wild life watch guard.
- Forest nursery (Entrepreneurship).

Job opportunities in Botany

Exit After **THREE** Year: **Degree Course**

V Semester- **A5: Plant Taxonomy and Resource Botany**

V Semester- **A6: Genetics and Cell Biology**

VI Semester- **A7: Plant Physiology and Biochemistry**

VI Semester- **A8: Plant Biotechnology**

Job opportunities in Botany

In Addition to two year diploma

- Supplying the angiosperm plants and cytological slides to the educational institutions and other line departments (Entrepreneurship).
- Advisor for Health department
- Marketing NTFPs species (Entrepreneurship).
- RFO/ forest officers
- Biochemical Laboratory (Soil, Water, Air testing etc). (Entrepreneurship).
- Adviser to grow advanced crop (Biotech crop).
- Farmer friendly liaison officer.
- Advisor for crop improvement programme.
- Teacher in primary and High Schools

Job opportunities in Botany

Exit After FOUR Year: Degree Course (Honors)

VII Semester-	A9: Molecular Biology
VII Semester-	A10: Seed Biology and Seed Technology
VII Semester-	A11: Plant Health Technology
VIII Semester-	A12: Medicinal Plants and Phytochemistry
VIII Semester-	A13: Bioinformatics & Computational Biology
VIII Semester-	A14: Research Methodology

Jobs opportunities in Botany

In Addition to three year degree

- Assisting for Ayurvedic doctors.
- Medicinal plants Marketing (Entrepreneurship).
- R & D Botany, Biotechnology, Ayurvedic and Pharmaceutical Lab.
- Laboratory on checking food adulteration (Entrepreneurship).
- Soil and water assessment laboratory (Entrepreneurship).
- Biological material analysis Laboratory (Entrepreneurship).
- Teacher in primary and High Schools.
- Prepare for joining Research institution for Ph.D. programmes.
- Wild life photographer
- Separation and Analyzing phytochemical compounds.
- Seed technician.
- Plant health manager

B.Sc. BOTANY: Semester - 3
Theory: Discipline Specific Core Course (DSCC)
Title of the Course and Code:
BOT-A-3.1: PLANT ANATOMY AND DEVELOPMENT BIOLOGY

Course No.	Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/ Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks
BOT-A-3.1	DSCC	Theory	04	04	56 hrs	3hrs	40	60	100

Course Outcomes:

On completion of this course, the students will be able to:

1. Observation of variations that exist in internal structure of various parts of a plant and as well as among different plant groups in support for the evolutionary concept.
2. Skill development for the proper description of internal structure using botanical terms, their identification and further classification.
3. Induction of the enthusiasm on internal structure of locally available plants.
4. Understanding various levels of organization in a plant body with an outlook in the relationship between the structure and function through comparative studies.
5. Observation and classification of the floral variations from the premises of college and house.
6. Understanding the various reproductive methods sub-stages in the life cycle of plants
7. Observation and classification of the embryological variations in angiosperms.
8. Enthusiasm to understand evolution based on the variations in reproduction among plants.

PLANT ANATOMY

Unit 1: ANGIOSPERM ANATOMY- PLANT CELL STRUCTURE AND TISSUES

14 Hrs

Introduction, objective and scope of Plant Anatomy, Plant cell structure – nature of plant cell wall.

Tissue and tissue systems - meristematic tissue, permanent tissue and secretory cells.

Classification of meristem: (apical, intercalary and lateral), primary and secondary meristem.

Apical meristem: Theories on organization of meristem (apical cell theory, Tunica-Corpus theory, histogen theory and Korper-Kappe theory), quiescent centre, Root cap.

Evolution and concept of organization of shoot apex (Apical cell theory, Histogen theory, Tunica Corpus theory continuing meristematic residue, cytohistological zonation).

Unit II: MORPHOGENESIS AND DIFFERENTIATION

14 Hrs.

Morphogenesis in plants - Differentiation of root, stems and leaf.

Types of vascular bundles and Vascular cambium, Origin, development, arrangement and diversity in size and shape of leaves.

Structure of Dicot root: primary and secondary structures (Tridax/Sunflower), Structure of monocot root (Maize).

Structure of Dicot stem: Primary and secondary structures (Tridax/Sunflower), Structure of Monocot stem (Maize), Nodal anatomy.

Structure of Dicot leaf: primary structure (Tridax/Sunflower), primary structure of Monocot leaf (Maize), Stomatal types. Anomalous secondary growth: Aristolochia/Boerhaavia (dicot stem) Dracaena (monocot stem).

Applications in systematics, forensics and Pharmacognosy.

DEVELOPMENT BIOLOGY

Unit III: Morphogenesis and Differentiation

14 Hrs.

Differentiation and cell polarity in acellular (*Dictyostelium*), Unicellular (*Acetabularia*) and multicellular system (root hair and stomata formation) Shoot Apical meristem (SAM): Origin, structure and function, Cytohistological zonation and Ultrastructure of meristems. Organogenesis: Differentiation of root, stem, leaf and axillary buds, bud dormancy

Mechanism of leaf primordium initiation, development and Phyllotaxis (Diversity in size and shape of leaves)

Structure and function of root apical meristem (RAM): Root cap, quiescent centre and origin of lateral roots.

Transition from vegetative apex into reproductive apex

Developmental patterns at flowering apex: ABC model specification of floral organs. Modification of gene action by growth hormones and cellular differences between floral organs. Senescence – a general account.

Unit IV: Reproductive Biology

14 Hrs.

Introduction, Scope and contributions of Indian embryologists: P. Maheswari, B G L Swamy, P.Maheshwari, M.S. Swaminathan and K.C. Mehta.

Microsporangium: Development and structure of mature anther, Anther wall layers, Tapetum - types, structure and functions and sporogenous tissue.

Microsporogenesis - Microspore mother cells, microspore tetrads, Pollinia.

Microgametogenesis – Formation of vegetative and generative cells, structure of male gametophyte. Pollen embryosac (Nemec phenomenon).

Megasporangium – Structure of typical Angiosperm ovule. Types of ovule- Anatropous, Orthotropous, Amphitropous, Circinotropous. **Megagametogenesis** – Types of development of Female gametophyte/embryosac- monosporic- *Polygonum* type, bisporic – *Allium* type, tetrasporic - *Fritillaria* type. Structure of mature embryosac.

Pollination and fertilization: Structural and functional aspects of pollen, stigma and style. Post pollination events; Current aspects of fertilization and Significance of double fertilization, Post fertilization changes.

Endosperm – Types and its biological importance. Free nuclear (*Cocos nucifera*) cellular (*Cucumis*), helobial types. Ruminant endosperm.

Embryogenesis – Structure and composition of zygote, Dicot (*Capsella bursa-pastoris*) and Monocot (*Najas*) embryo development. A general account of seed development.

B.Sc. BOTANY: Semester - 3
Practical: Discipline Specific Core Course (DSCC)
Title of the Course and Code:
BOT-A-3.2: PLANT ANATOMY AND DEVELOPMENT BIOLOGY

Course No.	Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/ Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks
BOT-A-3.2	DSCC	Practical	02	04	52 hrs	3hrs	25	25	50

LIST OF EXPERIMENTS TO BE CONDUCTED

Practical No.1

- i) Study of meristem (Permanent slides/ Photographs).
- ii) Study of Simple Tissues (Parenchyma, Collenchyma and Sclerenchyma) and Complex Tissues (xylem and phloem).

Practical No.2

Maceration technique to study elements of xylem and phloem, Study of primary structure of dicot root, stem and leaf (Sunflower) and monocot root, stem and leaf (Maize)

Practical No.3

Study of Normal secondary growth structure in dicot stem and root (Sunflower)

Practical No.4

Anomalous secondary growth: *Aristolochia*, *Boerhaavia* (dicot stem) *Dracaena* (monocot stem)

Practical No. 5

Study of trichomes (any three types) and stomata (any three types) with the help of locally available plant materials

Practical No. 6

Permanent slides of Microsporogenesis and male gametophyte Mounting of Pollen grains of Grass and Hibiscus and Pollinia of Calotropis

Practical No. 7

Pollen germination (hanging drop method) and Effect of Boron and Calcium on pollen germination

Practical No. 8

Permanent slides of types of ovules, Megasporogenesis &embryosac development and types of placentation: Axile, Marginal and Parietal types. Sectioning of ovary, for the studied types of placentation

Practical No. 9

Mounting of embryo: Tridax and Cyamopsis, Mounting of endosperm: Cucumis

Practical No. 10 and 11

Mini project work in groups of 3-5 students, from the following list

- a) Study of pollen morphology of different flowers with respect to shape, colour, aperture etc.
- b) Pollen germination of different pollen grains and calculates percentage of germination.
- c) Calculating percentage of germination of one particular type of pollen grain collected from different localities/ under different conditions.
- d) Study of placentation of different flowers.
- e) Any other relevant study related to Anatomy / Embryology.

Text Books for Reference:

1. Bhojwani and Bhatnagar, Introduction to Embryology of Angiosperms –Oxford & IBH, Delhi
2. Bhojwani Sant Saran, 2014.Current Trends in the Embryology of Angiosperms, Woong-Young Soh, Springer Netherlands,
3. Coutler E. G. , 1969. Plant Anatomy – Part I Cells and Tissues – Edward Arnold, London.
4. Dickison, W.C. (2000). Integrative Plant Anatomy, Harcourt Academic Press, USA
5. Eames A. J. - Morphology of Angiosperms - Mc Graw Hill, New York.
6. Esau, K. 1990. Plant Anatomy, Wiley Eastern Pvt Ltd New Delhi
7. Evert, R.F. (2006) Esau's Plant Anatomy: Meristem, Cells, and Tissues of the Plant Body: Their Structure, Function and Development. John Wiley and Sons, Inc
8. Fahn, A.1992. Plant Anatomy, Pergamon Press, USA
9. Johri, B.M. 1., 1984.Embryology of Angiosperms, Springer-Verlag, Netherlands.
10. Karp G., 1985. Cell Biology; Mc.Graw Hill Company
11. Maheshwari,P 1950. An introduction to the embryology of angiosperms. New York: McGraw-Hill
12. Mauseth, J.D. (1988). Plant Anatomy, the Benjammin/Cummings Publisher, USA.
13. Nair P .K .K - Pollen Morphology of Angiosperms - Scholar Publishing House, Lucknow
14. Pandey S.N. 1997, Plant Anatomy and Embryology .A. Chadha, Vikas Publication House Pvt Ltd;
15. Pandey, B. P., 1997. Plant Anatomy, S.Chand and Co. New Delhi
16. Raghavan, V., 2000. Developmental Biology of Flowering plants, Springer, Netherlands.
17. Saxena M. R. – Palynology – A treatise - Oxford & I. B .H., New Delhi.

18. Shivanna, K.R., 2003. Pollen Biology and Biotechnology. Oxford and IBH Publishing Co. Pvt.Ltd. Delhi.
19. Vashishta .P.C .,1984. Plant Anatomy – Pradeep Publications – Jalandhar
20. Vashishta, P.C. 1997. Plant Anatomy, Pradeep Publications

B.Sc. BOTANY SEMESTER IV

Title of the Course: Ecology and Conservation Biology

Number of Theory Credits	Total Lecture Hours/Semester	Number of Practical Credits	Total Practical hours/Semester
04	56	02	56

Contents of Theory Course		
Unit	Topics	Teaching Hours
I	<p>Introduction to Ecology and Conservation Biology: Definitions, Principles of Ecology, Brief History, Major Indian Contributions, Scope and importance. Ecological levels of organisation.</p> <p>Ecological factors: Climatic factors: light, temperature, precipitation and humidity. Edaphic factors: Soil and its types, soil texture, soil profile, soil formation; physico-chemical properties of soil - mineral particle, soil pH, soil aeration, organic matter, soil humus and soil microorganisms. Topographic Factors: Altitude</p> <p>Ecological groups of plants and their adaptations: Morphological and anatomical adaptations of hydrophytes, xerophytes, epiphytes and halophytes.</p>	15 hrs
II	<p>Ecosystem Ecology: Introduction, types of ecosystems with examples -terrestrial and aquatic, natural and artificial. Structure of ecosystem: Biotic and Abiotic components, detailed structure of a pond ecosystem. Ecosystem functions and processes: Food chain-grazing and detritus; Food web. Ecological pyramids -Pyramids of energy, biomass and number. Principles of Energy flow in ecosystem. Bio-geo chemical cycles: Gaseous cycles -carbon and nitrogen, Sedimentary cycle-Phosphorus. Ecological succession: Definition, types- primary and secondary. General stages of succession. Hydrosere and xerosere.</p> <p>Community Ecology: Community and its characteristics – frequency, density, Abundance, cover and basal area, phenology, stratifications, life-forms. Concept of Ecotone and Ecotypes. Intra-specific and Inter-specific interactions with examples.</p> <p>Ecological methods and techniques: Methods of sampling plant communities – transects and quadrates. Remote sensing as a tool for vegetation analysis, land use – land cover mapping.</p> <p>Population Ecology: Population and its characteristics – Population density, natality, mortality, age distribution, population growth curves and dispersal.</p>	15 hrs

III	<p>Phytogeography and Environmental issues:</p> <p>Theory of land bridge, theory of continental drift, polar oscillations and glaciations. Centre of origin of plant – Vavilov’s concept, types. Phytogeographical regions – concept, phytogeographical regions of India.</p> <p>Vegetation types of Karnataka – Composition and distribution of evergreen, semi-evergreen, deciduous, scrub, mangroves, shoal forests and grasslands. An account of the vegetation of the Western Ghats.</p> <p>Pollution: Water pollution: Causes, effect, types; water quality indicators, water quality standards in India, control of water pollution (Waste water treatment).</p> <p>Water pollution disasters – National mission on clean Ganga ,Minimata, Pacific gyre garbage patch, Exxon valdez oil spill.</p> <p>Air pollution: Causes, effect, air quality standards, acid rain, control.</p> <p>Soil pollution: Causes, effect, solid waste management, control measures of soil pollution.</p>	11hrs
IV	<p>Biodiversity and its conservation:</p> <p>Biodiversity: Definition, types of biodiversity - habitat diversity, species diversity and genetic diversity, Global and Indian species diversity. SDG’s in biodiversity conservation.</p> <p>Values of Biodiversity – Economic and aesthetic value, Medicinal and timber yielding plants. NTFP. Threats to biodiversity.</p> <p>Concept of Biodiversity Hotspots, Biodiversity hot spots of India.</p> <p>Concept of endemism and endemic species.</p> <p>ICUN plant categories with special reference to Karnataka/ Western Ghats.</p> <p>Biodiversity Conservation- Indian forest conservation act, Biodiversity bill (2002).</p> <p>Conservation methods – <i>In-situ</i> and <i>ex-situ</i> methods</p> <p><i>In-situ</i> methods –Biosphere reserves, National parks, Sanctuaries, Sacred grooves.</p> <p><i>Ex-situ</i> methods-Botanical gardens, Seed bank, Gene banks, Pollen banks, Culture collections, Cryopreservation.</p>	15 hrs
Total		56 Hours

SUGGESTED REFERENCE BOOKS:

1. Sharma, P.D. 2018. Fundamentals of Ecology. Rastogi Publications.
2. Odum E.P. (1975): Ecology By Holt, Rinert& Winston.
3. Oosting, H.G. (1978): Plants and Ecosystem Wadworth Belmont.
4. Kochhar, P.L. (1975): Plant Ecology. (9th Edn.,) New Delhi, Bombay, Calcutta-226pp.,
5. Kumar, H.D. (1992): Modern Concepts of Ecology (7th Edn.,) Vikas Publishing Co., New Delhi.
6. Kumar H.D. (2000): Biodiversity & Sustainable Conservation. Oxford & IBH Publishing Co Ltd. New Delhi.
7. Newman, E.I. (2000): Applied Ecology, Blackwell Scientific Publisher, U.K.
8. Chapman, J.L&M.J. Reiss (1992): Ecology (Principles & Applications). Cambridge University Press, U.K.
9. Malcolm L. Hunter Jr., James P. Gibbs, Viorel D. Popescu, 2020. Fundamentals of Conservation Biology, 4th Edition. Wiley-Blackwel.
10. Saha T. K., 2017. Ecology and Environmental Biology. Books and Allied Publishers.

List of Practicals in Ecology and Conservation Biology

Practical No.	Experiments
1	Determination of pH of different types of Soils, Estimation of salinity of soil/water samples.
2	Study of Ecological instruments – Wet and Dry thermometer, Altimeter, Hygrometer, Soil thermometer, Rain Gauge, Barometer, etc
3	Hydrophytes: Morphological adaptations in <i>Pistia</i> , <i>Eichhornia</i> , <i>Hydrilla</i> , <i>Nymphaea</i> . Anatomical adaptations in <i>Hydrilla</i> (stem) and <i>Nymphaea</i> (petiole).
4	Xerophytes: Morphological adaptations in <i>Asparagus</i> , <i>Casuarina</i> , <i>Acacia</i> , <i>Aloe vera</i> , <i>Euphorbiatirucalli</i> . Anatomical adaptations in phylloclade of <i>Casuarina</i> .
5	Epiphytes: Morphological adaptations in <i>Acampe</i> , <i>Bulbophyllum</i> , <i>Drynaria</i> . Anatomical adaptations in epiphytic root of <i>Acampe/ Vanda</i> . Halophytes: study of Viviparyin mangroves, Morphology and anatomy of Pneumatophores.
6	Study of a pond/forest ecosystem and recording the different biotic and abiotic components
7	Demonstration of different types of vegetation sampling methods – transects and quadrats. Determination of Density and frequency.
8	Application of remote sensing to vegetation analysis using satellite imageries
9	Field visits to study different types of local vegetations/ecosystems and the report to be written in practical record book.
10	Determination of water holding capacity of soil samples
11	Determination of Biological oxygen demand (BOD)
12	Determination of Chemical oxygen demand (COD)
13	Determination of soil texture of different soil samples.

ಸರ್ಕಾರಿ ಪ್ರಥಮದರ್ಜೆ ಕಾಲೇಜು ಶಿರಾಳಕೊಪ್ಪ.

ಸಮಾಜಶಾಸ್ತ್ರ ವಿಭಾಗ

ತೃತೀಯ ಬಿಎ

ಪತ್ರಿಕೆ: 5 ಸಮಾಜಶಾಸ್ತ್ರೀಯ ಚಿಂತನೆಯ ಮೂಲ ನೆಲೆಗಳು.

ಅಧ್ಯಾಯ: 1 ಸಮಾಜಶಾಸ್ತ್ರೀಯ ಚಿಂತನೆಯ ಬೆಳವಣಿಗೆ.

ಸಮಾಜಶಾಸ್ತ್ರೀಯ ಚಿಂತನೆಯ ಅರ್ಥ, ವ್ಯಾಖ್ಯಾನ ಮತ್ತು ಪ್ರಾಮುಖ್ಯತೆ.

ಸಮಾಜಶಾಸ್ತ್ರೀಯ ಚಿಂತನೆಯ ಬೆಳವಣಿಗೆ. ಸಾಮಾಜಿಕ ಚಿಂತನೆಯ ಹಂತಗಳು.

ಅಧ್ಯಾಯ: 2 ಆಗಸ್ಟ್ ಕೋಮ್ಸ್

ಆಗಸ್ಟ್ ಕೋಮ್ಸ್ ಸಂಕ್ಷಿಪ್ತ ಜೀವನ ಚರಿತ್ರೆ ಮತ್ತು ಅವರ ಕೊಡುಗೆಗಳು.

A. ಮೂರು ಹಂತಗಳ ಸೂತ್ರ B. ವಿಜ್ಞಾನಗಳ ಶ್ರೇಣಿ ವ್ಯವಸ್ಥೆ.

ಅಧ್ಯಾಯ: 3 ಹರ್ಬರ್ಟ್ ಸ್ಪೆನ್ಸರ್

ಸ್ಪೆನ್ಸರ್ ಸಂಕ್ಷಿಪ್ತ ಜೀವನ ಚರಿತ್ರೆ ಮತ್ತು ಅವರ ಕೊಡುಗೆಗಳು.

A. ಸ್ಪೆನ್ಸರ್ ವಿಕಾಸವಾದಿ ತತ್ವ. B. ಜೈವಿಕ ಸಾದೃಶ್ಯದ ತತ್ವ.

ಅಧ್ಯಾಯ: 4 ಎಮಿಲಿ ದರ್ಕಿಂ

ಎಮಿಲಿ ದರ್ಕಿಂ ಸಂಕ್ಷಿಪ್ತ ಜೀವನ ಚರಿತ್ರೆ ಮತ್ತು ಅವರ ಕೊಡುಗೆಗಳು.

A. ಶ್ರಮವಿಭಜನೆಯ ತತ್ವ. B. ಆತ್ಮಹತ್ಯೆಯ ಪ್ರಕಾರಗಳು.

ಅಧ್ಯಾಯ: 5 ಮ್ಯಾಕ್ಸ್ ವೆಬರ್

ಮ್ಯಾಕ್ಸ್ ವೆಬರ್ ಸಂಕ್ಷಿಪ್ತ ವ್ಯಕ್ತಿತ್ವ ಪರಿಚಯ ಮತ್ತು ಅವರ ಕೊಡುಗೆಗಳು.

1. ನೌಕರಶಾಹಿ ಸಿದ್ಧಾಂತ. B. ಸಾಮಾಜಿಕ ಕ್ರಿಯೆಯ ಸಿದ್ಧಾಂತ.

ಅಧ್ಯಾಯ: 6 ಕಾರ್ಲ್ ಮಾರ್ಕ್ಸ್

ಮಾರ್ಕ್ಸ್ ಅವರ ಜೀವನ ಚರಿತ್ರೆ ಮತ್ತು ಅವರ ಕೊಡುಗೆಗಳು. ವರ್ಗ ಸಂಘರ್ಷ ಸಿದ್ಧಾಂತ.

ಅಧ್ಯಾಯ: 7 ಭಾರತೀಯ ಸಮಾಜಶಾಸ್ತ್ರಜ್ಞರು.

ಎ. ಆರ್. ದೇಸಾಯಿ : ಸಂಕ್ಷಿಪ್ತ ಜೀವನ ಚರಿತ್ರೆ, ಗ್ರಾಮೀಣ ಸಮಾಜ

ಎಂ. ಎನ್ ಶ್ರೀನಿವಾಸ್: ಸಂಕ್ಷಿಪ್ತ ಜೀವನ ಚರಿತ್ರೆ ಮತ್ತು ಇವರ ಕೊಡುಗೆಗಳು ಸಾಮಾಜಿಕ ಚಲನೆ, ಮತ್ತು ಪ್ರಬಲ ಜಾತಿ

ಇರಾವತಿ ಕರ್ವೆ: ಜೀವನ ಚರಿತ್ರೆ ಮತ್ತು ಬಂಧುತ್ವ ಅಧ್ಯಯನಕ್ಕೆ ಡಾ. ಇರಾವತಿ ಕರ್ವೆ ಅವರು ನೀಡಿದ ಕೊಡುಗೆಗಳು.



KUVEMPU UNIVERSITY
SHANKARAGHATTA-577451, SHIVAMOGGA, KARNATAKA

COURSE STRUCTURE AND SYLLABUS IN URDU (UG)

**As per the Choice Based Credit System (CBCS) designed
in accordance with**

**Learning Outcomes-Based Curriculum Framework (LOCF)
Under NEP 2020**

For

UNDER GRADUATE IN URDU LANGUAGE AND OPTIONAL

Leading to

**Ability Enhancement Compulsory Course (AECC) And
Discipline Specific Core (DSC)/Discipline Elective /Open
Elective**

**III and IV Semester B.A. B.Sc. B.Com. &
BBA/ BBA (T&T)/ BCA/BSW/BHA/B. Home
Science/ BA Music/ BA (FA) Etc. Degree Courses**

**With effect from
For Academic Year 2022-23 and onwards...**

Prof. RESHMA KAUSER, R
HOD of Urdu Department
D.V.S. Arts & Science College
SHIVAMOGGA

Principal
D.V.S. College of Arts & Science
Shivamogga

KUVEMPU UNIVERSITY 3RD AND 4TH LANGUAGE OPTIONAL AND OPEN ELECTIVE NEP SYLLABUS

Syllabus of B. A., Ability Enhancement Compulsory Course (AECC)

Course Title: B.A. Under Graduate Programme (UG) IIB

Course Code: AECC -3 -L-2-Urdu (B.A.) Effect from 2022-23 and onwards

Second Year	URDU LANGUAGE PAPER - III		Credit	3
	Title: Prose, Poetry, Drama and Essay Writing		Hours	4
	نثر، نظم، ڈرامہ اور مضمون نویسی			
Semester	Third	Texts: 1. Pasban-e-Adab Edt. By Editorial Board SSC Smg. 2. Urdu Ke Mukhtasar Drame Edt. By Dr. Asma Kouser Published by Nasheman Publishers, Shivamogga	Total Hours	64

Summative Assessment Marks: 60 Formative Assessment Marks: 40 Total=100: 4 Hours per week

Learning Outcomes		Suggested Pedagogy	
1. Fair knowledge about Urdu Language 2. Brief knowledge about Urdu Literature 3. Introduction about the famous Urdu Writers, Poets & Drama Writers 4. Brief Knowledge about Essay Writing		1. Lecture Method using Boards 2. Virtual Mode of Teaching 3. Power Point Presentation 4. Assignment, Presentations, etc. 5. Group discussions and class Seminars	
Unit-I Prose 1. Hamari Zaban ka Naam 2. Junoobi Hind ka ek 3. Saheb Bathroom Mein Hain 4. Gesu-e-Urdu Gesudaraz..... 5. Bhagwan ki Aamad	Syed Suleman Nadvi Suleman Athar Javeed Mujtaba Hussain Jawaid Danish Krishenchander	15	اکائی-1 نثر 1- ہماری زبان کا نام 2- جنوبی ہند کا ایک باکمال شاعر 3- صاحب ہاتھ روم میں ہیں 4- گیسوئے اردو گیسو دراز چاہانی گرو 5- بھگوان کی آمد
Unit-II Poems and Ghazals Poems: 1. Masnavi Dar Hajo 2. Aye Sharief Insano 3. Walda Marhoomaki .. 4. Dawath-e-Inqilab 5. Mujhse Pehlisi	Mirza Rafi Souda Sahir Ludhianvi Allama Iqbal Josh Malihabadi Faiz Ahmde Faiz	14	اکائی-11 نظمیں اور غزلیں 1- شہسوی درہجو فولاد خان کو تو ال 2- اے شریف انسانو 3- والدہ مرحومہ کی یاد میں 4- دعوت انقلاب 5- مجھ سے پہلی سی محبت مرے محبوب غزلیں: 1- خیر خیر عشق سن نہ جنوں 2- مجھے چھیننے کو ساقی 3- رسم دنیا نہ سہی فرض 4- خوش حالوں کی یاد 5- سامنے ان کے تڑپ 6- ترے عشق کی انتہا چاہتا ہوں 7- سر میں سودا بھی نہیں 8- ہونٹوں پہ کبھی ان کے
Ghazals: 1. Khabar Tahaur Ishq 2. Mujhe Chhedneko Saqi... 3. Rasm-e- Duniyana Sahi 4. Khush Jamalonki Yad... 5. Samne Unke Tadap..... 6. Tere Ishqki Inteha..... 7. Sar Mein Soudabhi Nahi 8. Honton pekabhi Unke....	Siraj Aurangabadi Insha Allah Khan Insha Yas Yagana Changezi Sikander Ali Wajad Asghar Goundavi Allama Iqbal Faraqh Gorakhpuri Ada Jaffari	15	
Unit-III Drame 1. Begum Ki Billi 2. Darwaza 3. Anjam Bakhair	Imtiyaz Ali Taj Krisherchander Pitras Bukhari	14	اکائی-111 ڈرامے 1- بیگم کی بلی 2- دروازہ 3- انجام بخیر
Unit-IV Essay Writing	Siyasi, Samaji, Adabi Mazameen	06	اکائی-IV مضمون نویسی

Syllabus of B. A., Ability Enhancement Compulsory Course (AECC)

Course Code: AECC -1 -L-2-Urdu (B.A.,) Effect from 2021-22 and onwards

URDU LANGUAGE PAPER - I

Credit 3
Hours 4

Title: Prose, Poetry, Short Stories and Forms of Prose

نثر، نظم، افسانے اور اصناف نثر

Total Hours 64

Texts: 1. Karwan-e-Adab Edt. By Dr. Syed Sanaula
2. Das Muqtasar Afsane Edt. By Dr. Syed Sanaula
Published by Nasheman Publishers, Shivamogga

Summative Assessment Marks: 60 Formative Assessment Marks: 40 Duration: 4 Hours per week

Outcomes	1. Fair knowledge about Urdu Language 2. Brief knowledge about Urdu Literature 3. Introduction about the famous Urdu Writers, Poets & Short Story Writers 4. Brief Knowledge about Forms of Prose	Suggested Pedagogy	1. Lecture Method using Boards 2. Virtual Mode of Teaching 3. Power Point Presentation 4. Assignment, Presentations, etc. 5. Group discussions and class seminars
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Unit-I Prose	Unit-II Poems and Ghazals
<p>1. Bintah-e-Bahaddur Shah 2. Khututh-e-Ghalib 3. Kafan 4. Faiz Ahmed Faiz 5. Sawere Jo Kal Aankh ...</p>	<p>1. Awardan Mushtari 2. Khaid Khane ki Raath 3. Aata Daal 4. Jadeed Tarakhiyath 5. Zamana</p> <p>Ghazals:</p> <p>1. Piya Baj Pyala piya.... 2. Jis Sar ko Ghuroor aaj.... 3. Hasti Apni Hubab ki si... 4. Asar Usko Zara Nahi 5. Layi Hayath Aayi 6. Badao na Aapas mein 7. Tamasha-e-Dair-o-Haram.. 8. Duniya Meri Bala Jane....</p>
<p>Khawaja Hassan Nizami Mirza Ghalib Premchand Mujtaba Hussain Pitras Bukhari</p>	<p>Mulla Wajhi Meer Anees Nazeer Akbar Abadi Altaf Hussain Hali Alama Iqbal</p> <p>Khuli Khutub Shah Meer Taqi Meer Meer Taqi Meer Momin Ibrahim Zouq Altaf Hussain Hali Mirza Dagh Fani Badayuni</p>
15	14
<p>خواجہ حسن نظامی مرزا غالب پریم چند مجتبیٰ حسین احمد شاہ پطرس بخاری</p>	<p>علاؤ جمعی میر انیس نظیر اکبر آبادی الطاف حسین حالی علامہ اقبال</p> <p>تقی قطب شاہ میر تقی میر میر تقی میر مومن ابراہیم ذوق الطاف حسین حالی مرداوغ دہلوی فانی بدایونی</p>
<p>1- بنت بہادر شاہ 2- خطوط غالب 3- کفن 4- فیض احمد فیض 5- سویرے جو کل آنکھ میری کھلی</p>	<p>اکائی-II نظمیں اور غزلیں 1- آوردن مشتری محمد تقی راہ محل 2- قید خانے کی رات 3- آتا داال 4- جدید ترقیات 5- زمانہ غزلیں: 1- پیاباج پیالہ پیاجائے نا 2- جس سر کو غرور آج 3- ہستی اپنی حباب کی 4- اثر اس کو ذرا نہیں 5- لائی حیات آئی تفتا 6- بڑھا دنہ آپس میں 7- تماشا نے دیو و حرم 8- دنیا میری بلا جانے</p>

Course Title: BBA, BCA, BBA (T&T) Etc. Under Graduate Programme(UG) IIB
Course Code: AECC-1-L-2-Urdu (BBA, BCA, BBA (T&T) Etc.,)
Effect from 2021-22 and onwards

First Year	First	URDU LANGUAGE PAPER - I Title: Prose , Poetry, Drama and Forms of Prose نثر، نظم، ڈرامہ اور اصناف نثر Text: Armughan-e-Adab Vol.1Part-1 Edt. By Prof. M.N. Sayeed And Prof. Iqbalunnisa Pub. by: India Urdu Institute, Opp. Jeevan Bima Nagar Park, Bengaluru-75	Credit	3
			Hours	4
			Total Hours	64

Summative Assessment Marks: 60 Formative Assessment Marks: 40 Duration: 4 Hours per week

Outcomes		Suggested Pedagogy	
1.Fair knowledge about Urdu Language 2.Brief knowledge about Urdu Literature 3.Introduction about the famous Urdu Writers, Poets & Drama Writers 4. Brief Knowledge about Forms of Prose		1.Lecture Method using Boards 2.Virtual Mode of Teaching 3.Power Point Presentation 4. Assignment, Presentations, etc. 5.Group discussions and class seminars	
Unit-I Prose 1. Khwaja Sag Parasti 2. Moulvi Abdul Haq 3. Jahan Mein Rehta Hun 4. Toba Tek Singh 5. Hostel mein Padhma	Meer Aman Dehelvi Khwaja Ahmed Farooqi Nazeer Siddiqui Sadath Hassan Manto Piras	15	اکائی-1 نثر 1-خواجہ مگ پرست 2-مولوی عبدالحق 3-جہاں میں رہتا ہوں 4-ٹوبہ ٹیک سنگھ 5-ہاسٹل میں پڑھنا
Unit-II Poems and Ghazals Poems: 1. Tazheek-e-Rozgar 2. Khushamad 3. Daulat aur Waqt 4. Bahar Ek De pahar 5. Hyder Ali Ghazals: 1. Fida-e-Dilbar rangeen ... 2. Madrasa tha Dair tha ... 3. Patta pata Bonta Bonta 4. Zamana Tujise agar ho.. 5. Dehen pe hain unke ... 6. Har ek bath pe kehte.... 7. Ab tho ghabrake yeh... 8. Ghazab kiya tere wade...	Mirza Rafi Souda Nazeer Akbar Abadi Altaf Hussain Hali Ehsan Danish Saghar Nizami Wali Aurangabadi Khwaja Meer Dard Meer Taqi Meer Mirza Rafi Souda Hyder Ali Aatish Mirza Ghalib Ibrahim Zouqh Mirza Dagli Dehelvi	14	اکائی-II نظمیں اور غزلیں 1-تضحیک روزگار 2-خوشامد 3-دولت اور وقت 4-بہار کی ایک دوپہر 5-حیدر علی غزلیں: 1- فدائے دلبر رنگین ادا ہوں 2- مدرسہ تقادیر تھا یا کعبہ 3- پتہ پتہ بونٹا بونٹا ہمارا 4- زمانہ تجھ سے اگر ہونا ساز 5- وہن پہ ہیں ان کے گماں 6- ہر ایک بات پہ کہتے ہو تم 7- اب تو گھبرا کے یہ کہتے ہیں 8- غضب کیا ترے وعدے پہ

Syllabus of B. A., Ability Enhancement Compulsory Course (AECC)

Course Code: AECC -1 -L-2-Urdu (B.A.) Effect from 2021-22 and onwards

URDU LANGUAGE PAPER - I

First Year

Credit 3

Hours 4

Title: Prose, Poetry, Short Stories and Forms of Prose

Semester

First

نثر، نظم، افسانے اور اصنافِ نثر
 Texts: 1. Karwan-e-Adab Edt. By Dr. Syed Sanaula
 2. Das Muqtasar Afsane Edt. By Dr. Syed Sanaula
 Published by Nasheman Publishers, Shivamogga

Total Hours 64

Summative Assessment Marks: 60 Formative Assessment Marks: 40 Duration: 4 Hours per week

Outcomes

1. Fair knowledge about Urdu Language
 2. Brief knowledge about Urdu Literature
 3. Introduction about the famous Urdu Writers, Poets & Short Story Writers
 4. Brief Knowledge about Forms of Prose

Suggested Pedagogy

1. Lecture Method using Boards
 2. Virtual Mode of Teaching
 3. Power Point Presentation
 4. Assignment, Presentations, etc.
 5. Group discussions and class seminars

Unit-I Prose

1. Bintah-e-Bahaddur Shah
2. Khututh-e-Ghalib
3. Kafan
4. Faiz Ahmed Faiz
5. Sawere Jo Kal Aankh ...

Khwaja Hassan Nizami
 Mirza Ghalib
 Premchand
 Mujtaba Hussain
 Pitras Bukhari

15

خواجہ حسن نظامی
 مرزا غالب
 پریم چند
 مجتبیٰ حسین
 احمد شاہ پطرس بخاری

ایکٹی-انثر
 1- بنت بہادر شاہ
 2- خطوطِ غالب
 3- کفن
 4- فیض احمد فیض
 5- سویرے جو کل آنکھ میری کھلی

Unit-II Poems and Ghazals

1. Awardan Mushtari
2. Khaid Khane ki Raath
3. Aata Daal
4. Jadeed Tarakhiyath
5. Zamana

Mulla Wajhi
 Meer Anees
 Nazeer Akbar Abadi
 Altaf Hussain Hali
 Alama Iqbal

14

ملا و جہی
 میر انیس
 نظیر اکبر آبادی
 الطاف حسین حالی
 علامہ اقبال

ایکٹی-II نظمیں اور غزلیں
 1- آوردن مشتری محمد قلی راہہ محل
 2- قید خانے کی رات
 3- آٹا دال
 4- جدید ترقیات
 5- زمانہ
 غزلیں:

ghazals:

1. Piya Baj Pyala piya....
2. Jis Sar ko Ghuroor aaj....
3. Hasti Apni Hubab ki si...
4. Asar Usko Zara Nahi
5. Layi Hayath Aayi
6. Badao na Aapas mein
7. Tamasha-e-Dair-o-Haram..
8. Duniya Meri Bala Jane....

Khuli Khutub Shah
 Meer Taqi Meer
 Meer Taqi Meer
 Momin
 Ibrahim Zouq
 Altaf Hussain Hali
 Mirza Dagh
 Fani Badayuni

14

قلمی قطب شاہ
 میر تقی میر
 میر تقی میر
 مومن
 ابراہیم ذوق
 الطاف حسین حالی
 مرزا داغ دہلوی
 فانی بدایونی

1- بیابان بیالہ بیاجائے نا
 2- جس سر کو غرور آج
 3- ہستی اپنی حباب کی
 4- اثر اس کو ذرا نہیں
 5- لائی حیات آئی قضا
 6- بڑھاؤ نہ آپس میں
 7- تماشا دے دیو حرم
 8- دنیا میری بلا جانے

Syllabus of B.Com., Ability Enhancement Compulsory Course (AECC)

Course Title: B.Com. Under Graduate Programme (UG) IIB

Course Code: AECC -3 -L-2-Urdu (B.Com.,) Effect from 2022-23 and onwards

Second Year	Third	Text: Pasban-e-AdabEdt. By Editorial Board SSC Smg. and Aina-e-SahafathEdt. By Dr. Syed AleemullaHussaini and Dr. Syed Taj-ul-HUda	Credit	3
Semester			Hours	4
			Total Hours	64

Summative Assessment Marks: 60 Formative Assessment Marks: 40 Total=100: 4 Hours per week

Learning Outcomes	1. Fair knowledge about Urdu Language	Suggested Pedagogy	1. Lecture Method using Boards
	2. Brief knowledge about Urdu Literature		2. Virtual Mode of Teaching
	3. Introduction about the Urdu Journalism and Journalists		3. Power Point Presentation
	4. Brief Knowledge about Precise Writing		4. Assignment, Presentations, etc.
			5. Group discussions and class Seminars

Unit-I Prose Hamari Zabanka Nam Junoobi Hind kaek..... Saheb Bathroom mein... Gesu-e-Urdu Gesudaraz Bhagwan kiAamad	Syed Suleman Nadvi Suleman Athar Javeed Mujtaba Hussain Jawaid Danish Krishenchander	15	سید سلیمان ندوی سلیمان اطہر جاوید مجتبیٰ حسین جاوید دانش کرشن چندر	اکائی-انثر 1۔ ہماری زبان کا نام 2۔ جنوبی ہند کا ایک باکمال شاعر 3۔ صاحب ہاتھ روم میں ہیں 4۔ گیسوے اردو گیسووراز چاپانی گرو 5۔ بھگوان کی آمد
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Unit-II Poems and Ghazals Poems: Masnavi Dar Hajo.... Ae ShareefInsano Walida Marhoomaki. Dawath-e-Inqalab Mujhse Pehlisi	Mirza Md. Rafi Souda Saher Ludhiyanavi Allama Iqbal Josh Malihabadi Faiz Ahmed Faiz	14	مرزا محمد رفیع سودا ساحر لدھیانوی علامہ اقبال جوش ملیح آبادی فیض احمد فیض	اکائی-11 نظمیں اور غزلیں 1۔ مشوی در بچو فولادخان کو تو ال 2۔ اے شریف انسانو 3۔ والدہ مرحومہ کی یاد میں 4۔ دعوت انقلاب 5۔ مجھ سے پہلی سی محبت مرے محبوب نہ مانگ غزلیں: 1۔ خیر خیر عشق سن نا جنوں۔۔ 2۔ مجھے چھیڑنے کو ساتی۔۔۔۔ 3۔ رسم دنیا نہ سہی فرض۔۔۔۔ 4۔ خوش جمالوں کی یاد آتی ہے۔۔۔۔ 5۔ سامنے ان کے تڑپ۔۔۔۔ 6۔ ترے عشق کی انتہا چاہتا ہوں۔۔۔۔ 7۔ سر میں سودا بھی نہیں۔۔۔۔ 8۔ ہونٹوں پہ بھی ان کے۔۔۔۔
Ghazals: Khabar TahaurIshq... Mujhe Chhedneko ... Rasm-e-Duniya no.... Khush Jamalunki.... Samne unketadap Tere Ishqkiinteha. Sar me Soudabhi..... Honton pebhiunke....	Siraj Aurangabadi Insha Allah Khan Insha Yas Yagana Changezi Sikarder Ali Wajad Asghar Goundavi Allama Iqbal Firaq Gorakhpuri Ada Jafary	15	سراج اورنگ آبادی انشاء اللہ خاں انشاء یاس یگانہ چنگیزی سکندر علی وجد اصغر گونڈوی علامہ اقبال فراق گورکھپوری ادا جعفری	

Unit-III Journalism Online Media ka Khabron kiAhmiyat. Press Conference Interview Mulaqath Nigari	Dr. Md. Ikramuddin Naseem Ahmed O.P.Verma O.P. Verma Dr. Ghazanfar Iqbal	14	ڈاکٹر خواجہ محمد اکرام الدین نسیم احمد او۔ پی۔ ورما او۔ پی۔ ورما ڈاکٹر حفصہ اقبال	اکائی-11 صحافت 1۔ آن لائن میڈیا کا تصور اور اردو 2۔ خبروں کی اہمیت اور ترتیب 3۔ پریس کانفرنس 4۔ انٹرویو 5۔ ملاقات نگاری
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Unit-IV Precise Writing Urdu Passage 1/3 rd		06		اکائی-11 اردو عبارت کو درست کر کے ایک تہائی بنانا ہے
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Course Matrix for B.A. (History-Hons)
For Academic Year 2021-22
[As per NEP-2020 Guidelines]

First Semester

Paper No.	Course	Title of the Course	Instruction Hours per week	Exam Duration Hours	Marks			Credits
					IA	ETE	Total	
1.1	DSC-1	Political History of Karnataka (BCE-3 to 10CE) Part-1	3	3	40	60	100	3
1.2	DSC-2	History and Culture of Ancient India- Part-I (from the early period to Sixth century B.C)	3	3	40	60	100	3
1.3	OE-1	Cultural History of Karnataka (CE3 to CE 10) OR Introduction to Archaeology	3	3	40	60	100	3
Total Credits								09

Second Semester

Paper No.	Course	Title of the Course	Instruction Hours per week	Exam Duration Hours	Marks			Credits
					IA	ETE	Total	
1.1	DSC-3	Political History of Karnataka (CE-11 to 1750AD)	3	3	40	60	100	3
1.2	DSC-4	History and Culture of Ancient India- Part-II (from Imperial Mouryas to 12 th century A.D)	3	3	40	60	100	3
1.3	OE-2	Cultural History of Karnataka (11 AD to 1750 AD) OR Manuscriptology	3	3	40	60	100	3
Total Credits								09

BA Semester-1 DSc-1

Course Title: Political History of Karnataka (BCE-3 to 10 CE) Part-1	
Total Contact Hours: 39 to 42	Course Credits: 3
Formative Assessment Marks: 40	Duration of ESA/ Exam: 60
Model Syllabus Authors:	Summative Assessment Marks:

Course Pre-requisite(s): Political history of Karnataka (BCE-3 to 10 CE) Part-1

Course Outcomes (COs):

At the end of the course the student should be able to:

- Understand the continuity of Political developments and strategies.
- Analysis the importance of causes for the rise of regional political dynasties.
- Understand contextual necessities which influenced the era of political supremacy.
- Understand and describe the contemporary political history.
- Appreciate the confluence of diverse political elements.

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-12)

Course Outcomes (COs) / Program Outcomes (POs)	DSC1	DSC2	DSC3	DSC4	DSC5	DSC6	OE1	OE2	SEC1	SEC2
Disciplinary Knowledge	X	x	X	x	x	x	x	x		
Communication Skills	X	x	X	x	x	x	x	x		
Critical Thinking	X	x	X	x	x	x	x	x	x	x
Problem Solving			X	x	x	x	x	x	x	x
Analytical Reasoning	X	x	X	x	x	x	x	x		
Cooperation and Team Work		x	X	x		x	x	x		x
Reflective Thinking		x	X	x	x	x	x	x	x	x
Self-motivated Learning			X	x	x	x	x	x	x	x
Diversity Management and Inclusive Approach	X	x	X	x		x	x	x		
Moral and Ethical Awareness Reasoning	X	x	X	x	x	x	x	x		x
Lifelong Learning		x		x	x	x	x	x		x

Course Articulation Matrix relates course outcomes of course with the corresponding program outcomes whose attainment is attempted in this course. Mark „X in the intersection cell if a course outcome addresses a particular program outcome.

**BA Semester-I
DSC-1**

Paper/ Course Title: Political History of Karnataka (BCE-3 to 10 CE) Part- 1

Content of Course	39/42 Hrs
Unit – 1 Introduction	13/14
Chapter No. 1. Geographical features, Survey of sources- Pre historic culture	05
Chapter No. 2. The Mauryas: Chandra Guptha Maurya- Bindusara- Asoka-The Satavahanas-Gautamiputra Satakarni – Kadmbas of Banavasi- Mayura Sharma.	05
Chapter No. 3 The Gangas of Talakad :Introduction, Durvineetha, Shripurusha, Rachamalla and Chavundaraya .	04
Unit–2 The Age of Empires	12/13
Chapter No. 4. Chalukyas of Badami: Introduction, Pulikesin II and Vinayaditya.	04
Chapter No. 5. The Rastrakutas: Introduction, Krishna I, Govinda III and Amoghavarsha Nrupatunga	04
Chapter No. 6. The Chalukyas of Kalyana :TailapaII, Vikramaditya VI and Someshwara III and Kalachuries of Kalyana: Bijalla-II	05
Unit – 3. Formation of State	14/15
Chapter No. 7. Kingship – Duties and Functions of King and his Ministers- Saptanga theory.	04
Chapter No. 8. Central And Provincial Administration and Land Grants System	05
Chapter No. 9. Rituals and Sacrifices – Coronation ceremony- Rajasuya and Vajapeya.	04
Chapter No. 10. Places of Historical importance: Locate Ten places and write the historical importance of each in one or two sentence. Sannati, Maski, Gavimatha, Siddapura, Jatinga Rameshwara, Brahmagiri, Shravana Belagola, Prathisthana, Halmidi, Talagunda, Chandravalli, Banavasi, Talakadu, Manyakheta, Badami, Ihole, Pattadakal, Kanchi, Kalyana and Bankapura.	02

Books for Reference:

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9. ಶೆಟ್ಟರ್ ಎಸ್. 2015, ಹಳಗನ್ನಡ ಭಾಷೆ, ಭಾಷಾ ವಿಕಸನ ಮತ್ತು ಭಾಷಾ ಭಾಂಧವ್ಯ, ಅಭಿನವ ಪ್ರಕಾಶನ, ಬೆಂಗಳೂರು.
10. ಷೇಕ್ ಅಲಿ & ಸುಂದರ.ಅ, 2018, ಕರ್ನಾಟಕಚರಿತ್ರೆ ಸಂಪುಟಗಳು 01 ರಿಂದ 07, ಪ್ರಸಾರಂಗ, ಹಂಪಿ ವಿಶ್ವವಿದ್ಯಾಲಯ.

Pedagogy:

- Lecture Method – Class Room Teaching
- Learning Through Project work
- Collaborative learning strategies
- Use of Learning Recourses like as
 - Audio – Visual aids
 - Films
 - Documentaries
 - Visit to historical sites

Assessment:

Weightage for assessments (in percentage)

Formative Assessment		
	Total Internal Assessment	Theory Part Semester End Examination
Internal (Session) Test	10+10= 20	60
Seminar/ Presentation/ Activity	10	
Assignments/ Case study/ Field work/ Project work etc.	10	
Total	40	
Grand Total		100

BA Semester 1 DSC-2

Course Title: History and Culture of Ancient India- Part-I (from the early period to Sixth century B.C)	
Total Contact Hours: 39 to 42	Course Credits: 3
Formative Assessment Marks: 40	Duration of ESA/Exam: 60
Model Syllabus Authors:	Summative Assessment Marks:

Course Pre-requisite(s): History and Culture of Ancient India- part-1

Course Outcomes (COs):

At the end of the course the student should be able to:

- Recognise the physical features of India and its impact on Indian culture
- Know various kinds of sources available for reconstruction of India's past
- Understand the Indo-Saraswathi culture and its contribution to Indian culture
- Know the significance of Vedic culture
- Identify the reasons for the rise of new religious movement in 6th century B.C. and understand the contributions of Jainism and Buddhism to Indian culture.
- Understand the process of cultural development in Ancient India and recognize the importance of historical places.

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-12)

Course Outcomes (COs) / Program Outcomes (POs)	DSC1	DSC2	DSC3	DSC4	DSC5	DSC6	OE1	OE2	SEC1	SEC2
Disciplinary Knowledge	x	x	x	x	x	x	x	x		
Communication Skills	x	x	x	x	x	x	x	x		
Critical Thinking	x	x	x	x	x	x	x	x	x	x
Problem Solving			x	x	x	x	x	x	x	x
Analytical Reasoning	x	x	x	x	x	x	x	x		
Cooperation and Team Work		x	x	x		x	x	x		x
Reflective Thinking		x	x	x	x	x	x	x	x	x
Self-motivated Learning			x	x	x	x	x	x	x	x
Diversity Management and Inclusive Approach	x	x	x	x		x	x	x		
Moral and Ethical Awareness Reasoning	x	x	x	x	x	x	x	x		x
Lifelong Learning		x		x	x	x	x	x		x

Course Articulation Matrix relates course outcomes of course with the corresponding program outcomes whose attainment is attempted in this course. Mark „X' in the intersection cell if a course outcome addresses a particular program outcome.

B A Semester-I DSC-2

Paper/Course Title: History and Culture of Ancient India- Part-I (from the early period to Sixth century B.C)

Content of Course	39/42 Hrs
Unit-1	10/11
Chapter No. 1 The Geographical features and their influence: Himalayan mountain ranges, Indo-Gangatic river basin, Vindya-Sathpura and Aravali mountain ranges, Deccan plateau, Western and Eastern Ghats and Costal Region.	05
Chapter No. 2 Sources: Archaeological sources- Excavation, Epigraphy, Numismatics and Monuments. Literary sources- Indigenous and Foreign accounts- Greek, Chines and Arab accounts.	05
Unit-2	15/16
Chapter No. 1 Indus Valley Civilisation: Origin, Extent, Important sites- Harappa, Mohenjodaro, Lothal, Kalibangan and Dholaveera, Town planning, Society, Economy, Religion, Art, Script and causes for the decline.	07
Chapter No. 2 Vedic Culture: Early Vedic period- Vedic literature, Polity, Society, Economy, and Religion. Later Vedic period- Polity, Society, Economy and Religion.	08
Unit – 3	12/13
Chapter No. 1 Socio-Religious reformation movement: Causes for the rise of new religious movement. Jainism: Philosophy of Mahaveera, Causes for the rise and decline of Jainism and contributions of Jainism to Indian Culture. Buddhism: Philosophy of Buddha, Causes for the rise and decline of Buddhism and contributions of Buddhism to Indian Culture	12
Unit-4	
Places of Historical importance: Locate Ten places and write the historical importance of each in one or two sentence. Harappa, Mohenjodaro, Lothal, Kalibangan, Dholaveera, Ayodhya, Hasthinapura, Kousambi, Mithila, Kashi, Vallabi, Shravana Belagola, Mount Abu, Vaishali, Pavapuri, Lumbinivana, Buddha Gaya, Saranatha, Sanchi and Rajagriha.	02

Books for Reference

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2. Jha D.N. , (1977) 2015, *Ancient India- An Introductory Outline*, Asia Publishing House Bombay.
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13. ಅಂಬಳಿಕೆ ಹಿರಿಯಣ್ಣ (ಪ್ರಧಾನ ಸಂಪಾದಕರು), 2009, *ಕನ್ನಡ ವಿಷಯ ವಿಶ್ವಕೋಶ- ಇತಿಹಾಸ ಮತ್ತು ಪುರಾತತ್ವ*, ಕುವೆಂಪು ಆಧ್ಯಯನ ಸಂಸ್ಥೆ, ಮೈಸೂರು ವಿಶ್ವವಿದ್ಯಾಲಯ, ಮೈಸೂರು.
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15. ಬಾಶಮ್ ಎ.ಎಲ್. (ಮೂಲ) ಅನು: ಮಿರ್ಜಿ ಡಿ.ಆರ್, 2012, *ಪ್ರಾಚೀನ ಭಾರತವೆಂಬ ಅದ್ಭುತ*, ಐಬಿಹೆದ್ ಪ್ರಕಾಶನ, ಬೆಂಗಳೂರು.
16. ಮಜುಂದಾರ್ ಆರ್.ಸಿ. ರಾಯ್‌ಚೌಧುರಿ ಹೆಚ್.ಸಿ. ಮತ್ತು ದತ್ತಾ ಕೆ.ಕೆ. (ಮೂಲ) ಅನು: ಶಾರದಾ ಪ್ರಸಾದ್, 2012, *ಭಾರತದ ಪ್ರೌಢ ಇತಿಹಾಸ*, ಕುವೆಂಪು ಆಧ್ಯಯನ ಸಂಸ್ಥೆ, ಮೈಸೂರು ವಿಶ್ವವಿದ್ಯಾಲಯ, ಮೈಸೂರು.
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Pedagogy:

- Lecture Method – Class Room Teaching
- Learning Through Project work
- Collaborative learning strategies
- Use of Learning

Recourses like as
Audio – Visual
aids, Films
Documentaries

Assessment:**Weightage for assessments (in percentage)**

Formative Assessment		
	Total Internal Assessment	Theory Part Semester End Examination
Internal (Session) Test	10+10=20	60
Seminar/ Presentation/ Activity	10	
Case study/ Assignments/ Field work / Project work etc.	10	
Total	40	
Grand Total		100

BA Semester 1 Open Elective-1

Course Title: Cultural History of Karnataka (CE 3-CE 10) Part-I	
Total Contact Hours: 39 to 42	Course Credits: 3
Formative Assessment Marks: 40	Duration of ESA/Exam: 60
Model Syllabus Authors:	Summative Assessment Marks:

Course Pre-requisite(s): Cultural History of Karnataka (CE 3-CE 10) Part-I

Course Outcomes (COs):

At the end of the course the student should be able to:

- Provide an insight about the cultural development of Karnataka.
- Familiarize Karnataka history and culture.
- Expertize to analyze further development of culture of Karnataka.
- Analyze the factors responsible for origin and decline of dynasties.
- Provide the opportunity to understand the process of cultural diversities.

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-12)

Course Outcomes (COs) / Program Outcomes (POs)	DSC1	DSC2	DSC3	DSC4	DSC5	DSC6	OE1	OE2	SEC1	SEC2
Disciplinary Knowledge	x	x	x	x	x	x	x	x		
Communication Skills	x	x	x	x	x	x	x	x		
Critical Thinking	x	x	x	x	x	x	x	x	x	x
Problem Solving			x	x	x	x	x	x	x	x
Analytical Reasoning	x	x	x	x	x	x	x	x		
Cooperation and Team Work		x	x	x		x	x	x		x
Reflective Thinking		x	x	x	x	x	x	x	x	x
Self-motivated Learning			x	x	x	x	x	x	x	x
Diversity Management and Inclusive Approach	x	x	x	x		x	x	x		
Moral and Ethical Awareness Reasoning	x	x	x	x	x	x	x	x		x
Lifelong Learning		x		x	x	x	x	x		x

Course Articulation Matrix relates course outcomes of course with the corresponding program outcomes whose attainment is attempted in this course. Mark „X’ in the intersection cell if a course outcome addresses a particular program outcome.

BA Semester – I Open Elective

Paper/Course Title: Cultural History of Karnataka (CE 3-CE 10) Part-I

Content of Course	39/42 Hrs
Unit –1.Introduction	13/14
Chapter No. 1. Geographical Features and its influence, Language and Script	05
Chapter No. 2. Land Grants – In Ancient Karnataka	04
Chapter No. 3. Agriculture and Emergence of Agraharas as Education centers	05
Unit–2 Social Conditions	13/14
Chapter No. 4. Society-Marriage System-Food habits-Family and Customs.	05
Chapter No. 5. Religion – Traditions and Rituals	05
Chapter No. 6. Festivities and Pilgrimage: Shravanabelagola, Banashankari, Dharma Sthala, Shringeri,	04
Unit – 3 Religion and Art	13/14
Chapter No. 7. Jainism and Buddhism in Karnataka.	04
Chapter No. 8. Hinduism- Different Cults: Shaiva-Vaishnava-Bhagavata, Kalamukha, Kapalika, Shakta and Ganapathya.	05
Chapter No. 9. Art and Architecture, Paintings and Fine arts: Contributions of Chalukyas of Badami and Rashtrakutas.	05

Books for Reference

1. Basavaraja K.R, 1984, History and Culture of Karnataka: Early times to Unification, Chalukya publication, Dharwad.
2. Desai P.B., 1970, A History of Karnataka, Kannada Research Institute, Karnataka University, Dharwad.
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Pedagogy

- Lecture Method – Class Room Teaching
- Learning Through Project work
- Collaborative learning strategies
- Use of Learning Recourses like as
 - Audio – Visual aids
 - Films
 - Documentaries
 - Visit to historical sites

Assessment:

Weightage for assessments (in percentage)

Formative Assessment		
	Total Internal Assessment	Theory Part Semester End Examination
Internal (Session) Test	10+10=20	60
Seminar/ Presentation/ Activity	10	
Case study/ Assignments/ Field work / Project work etc.	10	
Total	40	
Grand Total		100

BA Semester 1 Open Elective

Course Title: Introduction to Archaeology	
Total Contact Hours: 39 to 42	Course Credits: 3
Formative Assessment Marks: 40	Duration of ESA/Exam: 60
Model Syllabus Authors:	Summative Assessment Marks:

Course Pre-requisite(s): Introduction to Archaeology

Course Outcomes (COs):

At the end of the course the student should be able to:

- Understand the concept of Archaeology as an ancillary for study of history
- Help to study features of Archaeology in understanding history
- Familiarize the students to know about scope of Archaeology.
- Understand the various tools and techniques imbibed in Archaeology
- Study various schools of disciplines of Archaeology.

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-12)

Course Outcomes (COs) / Program Outcomes (POs)	DSC1	DSC2	DSC3	DSC4	DSC5	DSC6	OE1	OE2	SEC1	SEC2
Disciplinary Knowledge	x	x	x	x	x	x	x	x		
Communication Skills	x	x	x	x	x	x	x	x		
Critical Thinking	x	x	x	x	x	x	x	x	x	x
Problem Solving			x	x	x	x	x	x	x	x
Analytical Reasoning	x	x	x	x	x	x	x	x		
Cooperation and Team Work		x	x	x		x	x	x		x
Reflective Thinking		x	x	x	x	x	x	x	x	x
Self-motivated Learning			x	x	x	x	x	x	x	x
Diversity Management and Inclusive Approach	x	x	x	x		x	x	x		
Moral and Ethical Awareness Reasoning	x	x	x	x	x	x	x	x		x
Lifelong Learning		x		x	x	x	x	x		x

Course Articulation Matrix relates course outcomes of course with the corresponding program outcomes whose attainment is attempted in this course. Mark „X’ in the intersection cell if a course outcome addresses a particular program outcome.

BA Semester 1 Open Elective

Title of the Course/ Paper: Introduction to Archaeology

Content of Course	39/42 Hrs
Unit – 1 Introduction	13/14
Chapter No. 1 Definition – Scope – Nature	03
Chapter No. 2 Concepts – Artifacts – Assemblage – Industry – Culture -Layer	05
Chapter No. 3 Kinds of Archaeology – Ethno, Marine and Salvage	06
Unit–2 Archaeology by Period	13/14
Chapter No. 4. Lower Paleolithic – Middle Paleolithic – Upper Paleolithic Mesolithic – Chalcolithic – Bronze age – Iron Age	05
Chapter No. 5. Development in the Global Context – From Antiquarians to Scientific Archaeology – Finders Petrie- Pitt Reveres – Leonard Wooly.	05
Chapter No. 6. Archaeology in India – William Jones to Wheeler – The Allchins – S.R. Rao – Archaeological Survey of India – Department of Archaeology Government of Karnataka	04
Unit – 3 Exploration, Excavation and Analysis	13/14
ChapterNo.7. Identification of a site – field survey – sampling techniques Application of scientific methods.	05
ChapterNo.8. Methods of Excavation – vertical, horizontal and Quadrant method	05
Chapter No. 9. Dating the Archaeological objects- Relative and absolute dating methods.	04

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Pedagogy

- Lecture Method – Class Room Teaching
- Visit to Archaeological sites
- Learn techniques of excavations
- Collaborative learning strategies
- Learning about Exploration, Trenching and digging
- Collection and Preservation of Artifacts

Assessment:

Weightage for assessments (in percentage)

Formative Assessment		
	Total Internal Assessment	Theory Part Semester End Examination
Internal (Session) Test	10+10=20	60
Seminar/ Presentation/ Activity	10	
Case study/ Assignments/ Field work / Project work etc.	10	
Total	40	
Grand Total		100

BA Semester 2

DSC-3

Course Title: Political History of Karnataka (CE11- 1750 AD)	
Total Contact Hours: 39 to 42	Course Credits: 3
Formative Assessment Marks: 40	Duration of ESA/Exam: 60
Model Syllabus Authors:	Summative Assessment Marks:

Course Pre-requisite(s): Political History of Karnataka (C11- 1750 AD)

Course Outcomes (COs):

At the end of the course the student should be able to:

- Understand the rise and fall of Political dynasties in Karnataka.
- Familiarize with the patterns of administration.
- Analyze the traditional values and ethos of political development.
- Understand the rise and fall of regional variations.
- Study the complexities involved in polity of the time.

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-12)

Course Outcomes (COs) / Program Outcomes (POs)	DSC1	DSC2	DSC3	DSC4	DSC5	DSC6	OE1	OE2	SEC1	SEC2
Disciplinary Knowledge	x	x	x	x	x	x	x	x		
Communication Skills	x	x	x	x	x	x	x	x		
Critical Thinking	x	x	x	x	x	x	x	x	x	x
Problem Solving			x	x	x	x	x	x	x	x
Analytical Reasoning	x	x	x	x	x	x	x	x		
Cooperation and Team Work		x	x	x		x	x	x		x
Reflective Thinking		x	x	x	x	x	x	x	x	x
Self-motivated Learning			x	x	x	x	x	x	x	x
Diversity Management and Inclusive Approach	x	x	x	x		x	x	x		
Moral and Ethical Awareness Reasoning	x	x	x	x	x	x	x	x		x
Lifelong Learning		x		x	x	x	x	x		x

Course Articulation Matrix relates course outcomes of course with the corresponding program outcomes whose attainment is attempted in this course. Mark „X in the intersection cell if a course outcome addresses a particular program outcome.

BA Semester 2-DSC-3

Course/ Paper Title: Political History of Karnataka (C11- 1750 AD) Part-2

Content of Course	39/42 Hrs
Unit – 1 Introduction-Historical Background	9/10
Chapter No. 1 The Hoysalas of Dwarasamudra: Introduction, Vishnuvardhana and Ballala II	05
Chapter No. 2 The Yadavas / Sevunas of Devagiri : Introduction, Billama V and Ramachandra Deva II	05
Unit–2 Medieval Karnataka	15/16
Chapter No. 3. Vijayanagar Dynasties: Introduction, Brief history of Sangama and Salva dynasties, Tuluvas- Krishnadeva Raya, Rama Raya and the Battle of Talikote	08
Chapter No. 4. The Bahamani States: Introduction, Establishment of Bahamani State- Mohammad Gavan- Administration, AdilShahis of Bijapur: Mohammad Adil Shah	05
Chapter No. 5. Maratha rule in Karnataka: Shahaji, Shivaji and Peshwas.	03
Unit – 3. Post Vijayanagar Period	15/16
Chapter No. 6. A. Wodeyars of Mysore: Introduction and Chikkadeva raja Wodeyar. B. Nayakas of Chithradurga: Introduction and early history. C. Nayakas of Keladi: Introduction, ShivappaNayaka and Rani Chennamma	05
Chapter No. 7. Minor Chieftains: A. Yalahanka nada prabhus: Kempe Gowda I B. Brief History of Sonda Nayakas	04
Chapter No. 8. Administration under Vijayanagara –Nayankara System-Keladi Shivappanayaka SHISTU.	05
Chapter No. 9. Places of Historical importance: Locate Ten places and write the historical importance of each in one or two sentence. Dwarasamudra, Belur, Devagiri, Udayagiri, Hampi, Anegondi, Talikote, Penugonde, Chandragiri, Gulbarga, Ahmad Nagara, Bijapur, Bidar, Keladi, Ikkeri, Nagara, Chithradurga, Banglore, Mysore, Sriranga Patna,	02

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Pedagogy

- Lecture Method – Class Room Teaching
- Learning Through Project work
- Collaborative learning strategies
- Use of Learning Recourses like as
 - Audio – Visual aids
 - Films
 - Documentaries

Assessment:

Weightage for assessments (in percentage)

Formative Assessment		
	Total Internal Assessment	Theory Part Semester End Examination
Internal (Session) Test	10+10=20	60
Seminar/ Presentation/ Activity	10	
Case study/ Assignments/ Field work / Project work etc.	10	
Total	40	
Grand Total		100

BA Semester 2

DSC-4

Course Title: History and Culture of Ancient India- Part-II (from Imperial Mouryas to 12 th century A.D)	
Total Contact Hours: 39 to 42	Course Credits: 3
Formative Assessment Marks: 40	Duration of ESA/Exam: 60
Model Syllabus Authors:	Summative Assessment Marks:

Course Pre-requisite(s): History and Culture of Ancient India- Part-I (from Imperial Mouryas to 12th century A.D)

Course Outcomes (COs):

At the end of the course the student should be able to:

- Understand the emergence of major imperial dynasties of India which ruled during Ancient period
- Notice the cultural contributions of different dynasties of Ancient India
- Understand development of administrative System, literature and Society in Ancient India
- Know the development of art and architecture in Ancient India
- Recognise the places of historical importance

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-12)

Course Outcomes (COs) / Program Outcomes (POs)	DSC1	DSC2	DSC3	DSC4	DSC5	DSC6	OE1	OE2	SEC1	SEC2
Disciplinary Knowledge	X	X	X	X	X	X	X	X		
Communication Skills	X	X	X	X	X	X	X	X		
Critical Thinking	X	X	X	X	X	X	X	X	X	X
Problem Solving			X	X	X	X	X	X	X	X
Analytical Reasoning	X	X	X	X	X	X	X	X		
Cooperation and Team Work		X	X	X		X	X	X		X
Reflective Thinking		X	X	X	X	X	X	X	X	X
Self-motivated Learning			X	X	X	X	X	X	X	X
Diversity Management and Inclusive Approach	X	X	X	X		X	X	X		
Moral and Ethical Awareness Reasoning	X	X	X	X	X	X	X	X		X
Lifelong Learning		X		X	X	X	X	X		X

Course Articulation Matrix relates course outcomes of course with the corresponding program outcomes whose attainment is attempted in this course. Mark „X in the intersection cell if a course outcome addresses a particular program outcome.

BA Semester- 2

DSC-4

Title of the Course/ Paper: History and Culture of Ancient India- Part-II (from Imperial Mouryas to 12th century A.D)

Content of Course	39/42 Hrs
Unit-1	9/10
Chapter No. 1 The Imperial Mouryas: Introduction- Ashoka's welfare state concept, the Mouryan Administration.	05
Chapter No. 2 Cultural Contributions of Kushanas: Introduction- Religion, Literature and Art and architecture.	04
Unit-2	10/11
Chapter No. 1 The Age of Guptas: Introduction- Religion, Literature, Science and technology and Art and architecture	05
Chapter No.2 Vardhanas: Harshavardhana- Religion, Education and literature, Nalanda university and Art and architecture.	05
Unit - 3	12/12
Chapter No.1 Sangam Age: Introduction and Sangam literature	02
Chapter No. 2 The cultural contribution of Pallavas: Introduction- Religion, Literature and Art and architecture.	05
Chapter No. 3 The cultural contribution of Cholas: Introduction- Administration with special reference to local-self government, Religion, Literature and Art and architecture.	05
Unit - 4	6/7
Chapter No. 1 The contributions of Rajapuths to Indian culture: Introduction- Their society, religion, literature and art and architecture.	06
Unit-5 Places of Historical importance: Locate Ten places and write the historical importance of each in one or two sentence. Pataliputhra, Maski, Sannati, Ujjaini, Purushapura, Taxila, Mathura, Gandhara, Prayaga, Kanauj, Nalanda, Tamralipthi, Madurai, Kanchi, Tanjore, Utthamerur, Khajuraho, Konark, Chitore and Ranatambore .	02

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16. ಮಜುಂದಾರ್ ಆರ್.ಸಿ. ರಾಯಚೌಧುರಿ ಹೆಚ್.ಸಿ. ಮತ್ತು ದತ್ತಾ ಕೆ.ಕೆ. (ಮೂಲ) ಅನು: ಶಾರದಾ ಪ್ರಸಾದ್, 2012, *ಭಾರತದ ಪ್ರೌಢ ಇತಿಹಾಸ*, ಕುವೆಂಪು ಆಧ್ಯಯನ ಸಂಸ್ಥೆ, ಮೈಸೂರು ವಿಶ್ವವಿದ್ಯಾಲಯ, ಮೈಸೂರು.
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.Pedagogy

- Lecture Method – Class Room Teaching**
- Learning Through Project work**
- Collaborative learning strategies**
- Use of Learning Recourses like as**
 - Audio – Visual aids**
 - Films**
 - Documentaries**

Assessment:**Weightage for assessments (in percentage)**

Formative Assessment		
	Total Internal Assessment	Theory Part Semester End Examination
Internal (Session) Test	10+10=20	60
Seminar/ Presentation/ Activity	10	
Case study/ Assignments/ Field work / Project work etc.	10	
Total	40	
Grand Total		100

BA Semester 2

Open Elective- 2

Course Title: Cultural History of Karnataka (11 AD to 1750 AD)	
Total Contact Hours: 39 to 42	Course Credits: 3
Formative Assessment Marks: 40	Duration of ESA/Exam: 60
Model Syllabus Authors:	Summative Assessment Marks:

Course Pre-requisite(s): Cultural History of Karnataka (11 AD to 1750 AD)

Course Outcomes (COs):

At the end of the course the student should be able to:

- Understand the concept of cultural heritage of Karnataka
- Study various cultural factors which influence the flow of culture
- Familiarize the factors which influenced in influencing culture and society
- Analyze the factors responsible for formation of pluralistic society
- Understand the concept “Unity in diversity”.

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-12)

Course Outcomes (COs) / Program Outcomes (POs)	DSC1	DSC2	DSC3	DSC4	DSC5	DSC6	OE1	OE2	SEC1	SEC2
Disciplinary Knowledge	x	x	x	x	x	x	x	x		
Communication Skills	x	x	x	x	x	x	x	x		
Critical Thinking	x	x	x	x	x	x	x	x	x	x
Problem Solving			x	x	x	x	x	x	x	x
Analytical Reasoning	x	x	x	x	x	x	x	x		
Cooperation and Team Work		x	x	x		x	x	x		x
Reflective Thinking		x	x	x	x	x	x	x	x	x
Self-motivated Learning			x	x	x	x	x	x	x	x
Diversity Management and Inclusive Approach	x	x	x	x		x	x	x		
Moral and Ethical Awareness Reasoning	x	x	x	x	x	x	x	x		x
Lifelong Learning		x		x	x	x	x	x		x

Course Articulation Matrix relates course outcomes of course with the corresponding program outcomes whose attainment is attempted in this course. Mark „X” in the intersection cell if a course outcome addresses a particular program outcome.

BA Semester 2- Open Elective-2

Title of the Course/Paper: Cultural History of Karnataka (11 AD to 1750 AD)

Content of Course	39/42 Hrs
Unit – 1 Introduction	13/14
Chapter No. 1 Administration – Central and Provincial	05
Chapter No. 2 Kingship – Duties of King – Governors and other officers - Warfare	04
Chapter No. 3 Local Self Government – Village Administration	05
Unit–2 Society and Economy	13/14
Chapter No. 1. Social Conditions – Society – Rituals and Customs	05
Chapter No. 2. Economic Conditions – Agriculture,	04
Chapter No. 3. Trade and Commerce: Internal and Foreign Trade	05
Unit – 3 Religion and Art	13/14
Chapter No. 1 Bhakti Saints Teaching and Philosophy: Ramanujacharya, Madhvacharya and Veerashaiva Movement – Basaveshwara and other Sharanas. Sufism in Karnataka.	06
Chapter No. 2. Temple Architecture: Contributions of Vijayanagra Empire. Islamic Architecture: Contributions Bahamani and Adilshahis.	04
Chapter No. 3. Painting and Fine Arts: Vijayanagara Empire	04

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Pedagogy

- Lecture Method – Class Room Teaching**
- Group Discussion**
- Visit to cultural sites**
- Preparation of charts**
- Learning Through Project work**
- Collaborative learning strategies**
- Use of Learning Recourses like as**
 - Audio – Visual aids
 - Films
 - Documentaries

Assessment:

Weightage for assessments (in percentage)

Formative Assessment		
	Total Internal Assessment	Theory Part Semester End Examination
Internal (Session) Test	10+10=20	60
Seminar/ Presentation/ Activity	10	
Case study/ Assignments/ Field work / Project work etc.	10	
Total	40	
Grand Total		100

BA Semester 2

Open Elective-2

Course Title: Manuscriptology	
Total Contact Hours: 39 to 42	Course Credits: 3
Formative Assessment Marks: 40	Duration of ESA/Exam: 60
Model Syllabus Authors:	Summative Assessment Marks:

Course Pre-requisite(s): Manuscriptology

Course Outcomes (COs):

At the end of the course the student should be able to:

- Understand the importance of manuscripts
- Study manuscripts as an ancillary for study of history
- Understand the concept of cataloguing of manuscripts
- Practice the science of conservation and preservation of manuscripts
- Visit libraries and Archives to study conservation and preservation

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-12)

Course Outcomes (COs) / Program Outcomes (POs)	DSC1	DSC2	DSC3	DSC4	DSC5	DSC6	OE1	OE2	SEC1	SEC2
Disciplinary Knowledge	x	x	x	x	x	x	x	x		
Communication Skills	x	x	x	x	x	x	x	x		
Critical Thinking	x	x	x	x	x	x	x	x	x	x
Problem Solving			x	x	x	x	x	x	x	x
Analytical Reasoning	x	x	x	x	x	x	x	x		
Cooperation and Team Work		x	x	x		x	x	x		x
Reflective Thinking		x	x	x	x	x	x	x	x	x
Self-motivated Learning			x	x	x	x	x	x	x	x
Diversity Management and Inclusive Approach	x	x	x	x		x	x	x		
Moral and Ethical Awareness Reasoning	x	x	x	x	x	x	x	x		x
Lifelong Learning		x		x	x	x	x	x		x

Course Articulation Matrix relates course outcomes of course with the corresponding program outcomes whose attainment is attempted in this course. Mark „X in the intersection cell if a course outcome addresses a particular program outcome.

BA Semester 2 Open Elective-2

Title of the Course/ Paper: Manuscriptology

Content of Course 1	39/42 Hrs
Unit – 1 Introduction	13/14
Chapter No. 1 Meaning – Definition – Character	04
Chapter No. 2 Scope and importance	05
Chapter No. 3 Types of Manuscripts - Methods of Study	04
Unit–2 Collection	13/14
Chapter No. 1 History of Manuscriptology	05
Chapter No. 2 Indian Manuscriptology	04
Chapter No. 3 Manuscripts in Kannada, Tigalari, Sanskrit, Pali, Tamil/Grantha, Tulu, Nandinagari and Modi	05
Unit – 3 Editing	13/14
Chapter No. 1 Collection of Manuscripts	03
Chapter No. 8. Process of Editing	05
Chapter No. 9 Preservation of Manuscripts	06

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Pedagogy

- Class room teaching
- Visit to repositories, Archives and institutions.
- Learn in repositories the techniques of preservation
- Learn conservative method
- Study and classify manuscripts in different languages

Assessment:

Weightage for assessments (in percentage)

Formative Assessment		
	Total Internal Assessment	Theory Part Semester End Examination
Internal (Session) Test	10+10=20	60
Seminar/ Presentation/ Activity	10	
Case study/ Assignments/ Field work / Project work etc.	10	
Total	40	
Grand Total		100

Blue Print of University exam Question Paper

KUVEMPU UNIVERSITY

First Semester B.A Degree Examinations

HISTORY

Semester Scheme

Paper: DSC

Time: 3 hrs

Max. Marks: 60

There are five main sections in the question paper. Section II III and IV have questions with choice, but Section I and V have no choice.

Section I

Five very short answer questions - All questions carry three marks each 3x5=15

Section II

Short answer questions-Answer any two out of four questions. 5X2=10

Section III

Medium answer question -Answer any one out of two questions. 10X1=10

Section IV

Long answer questions-Answer any one out of two questions. 15X1=15

Section V

On the outline map provided:

A. Locate the following places (Ten) and give historical importance in one sentence each. 5+5=10

B. For Blind students only*

Instead of map question one medium answer question.

*Blind students not answering the map question should enclose a copy of the certificate of blindness issued by the competent authority.

Blue Print of University exam Question Paper

KUVEMPU UNIVERSITY

First Semester B.A Degree Examinations

HISTORY

Semester Scheme

Paper: Open Elective

Time: 3 hrs

Max. Marks: 60

There are four main sections in the question paper. Section II and III have questions with choice, but Section I have no choice.

Section I

Five very short answer questions - All questions carry three marks each

3x5=15

Section II

Short answer questions-Answer any three out of six questions.

5X3=15

Section III

Long answer questions- Answer any two out of four questions.

15X2=30

PREAMBLE

Education empowers Mankind. A holistic education paradigm will effectively focus on developing knowledge, employable skill sets, appropriate attitudes and an overall personality. NEP is focused towards imparting such an education system.

India's first education policy of the 21st century is 'National Education Policy 2020' proposes the revision and revamping of all aspects of the education structure, including its regulation and governance. It seeks to create a new system that is aligned with the developmental aspirations & goals of 21st century education, including SDG4, while building upon India's traditions and value systems.

NEP aims for India to have an education system by 2040 that is second to none, with equitable access to the highest-quality education for all learners regardless of social or economic background and seeks to *“ensure inclusive and equitable quality education and promote lifelong learning opportunities for all” by 2030.*”

Vision of the National Education Policy 2020

- ✓ An education system that contributes to an equitable and vibrant knowledge society, by providing high-quality education to all.
- ✓ Develops a deep sense of respect towards the fundamental rights, duties and Constitutional values, bonding with one's country, and a conscious awareness of one's role and responsibilities in a changing world.
- ✓ Instils skills, values, and dispositions that support responsible commitment to human rights, sustainable development and living, and global well-being, thereby reflecting a truly global citizen.

As India is enjoying the demographic dividend, which will last till 2055 and to reap the benefits, a good education policy was the need of the hour. Hence there is lot of

hopes on the NEP, which has come as cure the edu-ailments and to plug the shortcomings of the education system which marred for 36 years and strengthen our education system. Expectations on NEP is high. As every good policy success lies in the implementation and active participation of its stake holders, so is the NEP. The success or failure of NEP lies in all our hands. Hence Let all of us join our hands in making the NEP successful.

As enshrined in the National Education Policy-2020 vision of introducing course curriculum for undergraduate studies under Choice Based Credit System (CBCS), the main objective of framing this curriculum of BA/B.Sc. (Basic/Hons) in Economics is to impart the students a holistic understanding of the subject giving substantial weightage to the core contents, skill, value-based and ability enhancement. The syllabus has given due importance on the main streams of the body of knowledge on Economics” with due recognition of its wide spectrum. The ultimate goal of the syllabus is to enable the students to have an in-depth knowledge on the subject and enhance their scope of employment at every level of exit. Adequate emphasis has been given on the new and emerging techniques and understanding of the subject under the changing regime and global context.

There is a need to strengthen the students to understand essential aspects of economics in diverse subject areas not only in social sciences, but also among other natural and physical sciences. The curriculum lays focus on creating new knowledge, acquiring new skills and capabilities in Economics producing an intelligent human resource serving the Economy and society

Composition of Curriculum Draft Committee for Economics

Sl.no	Name & Organization	Designation
1.	Dr. B.P. Veerabhadrappe Vice-Chancellor, Kuvempu University, Shankaraghatta	Chairperson
2.	Dr. B. K. Tulasimala Vice-Chancellor, KSAW University, Vijayapura	Member
3.	Dr. D.V. Gopalappa Professor, University of Mysore, Mysuru	Member
4.	Dr. S.T. Bagalkoti Professor, Karnatak University, Dharwad	Member
5.	Dr. S. R. Keshava Professor, Bangalore University, Bengaluru.	Member
6.	Dr. Viswanatha Professor, Mangalore University, Konaje	Member
7.	Dr. Dasharath Naik Professor, Gulbarga University, Kalaburgi.	Member
8.	Dr. Jayasheela Professor, Tumkur University, Tumakuru.	Member
9.	Dr. D.N. Patil Professor, Rani Channamma University, Belagavi	Member
10.	Dr. Basavaraja S. Benni Professor, VSK University, Ballari	Member
11.	Dr. Rangappa K.B. Professor, Davanagere University, Davanagere.	Member
12.	Dr. D. Kumuda Professor, Bengaluru North University, Kolar	Member
13.	Dr. N.T. Somashekhar Assoc. Professor, Maharani College, Mysuru	Member
14.	Dr. Hanumantharaya Y.S. Assoc. Professor, GFGC, Midigeshi, Madhugiri Tq.	Member
15.	Dr. Timmaraddi Assoc. Professor, A. S. Women's College, Ballari.	Member
16.	Dr. K.B. Dhanajaya Principal, Sahyadri Arts College, Shivamogga.	Member
17.	Dr. Joy Narella Assoc. Professor, University College of Arts, Tumakuru.	Member
18.	Dr. Prasanna Pandhari GFGC, Rajnagar, Hubballi	Member
19.	Dr. Tejaswini B. Yakkundimath Special Officer, Karnataka State Higher Education Council	Member Convener

PREFACE

The course curriculum for undergraduate studies under choice-based credit system (CBCS) for BA/B.Sc. in Economics (Basic/Hons) is framed in this document. As a first step the first and second semester Syllabus and the entire course structure is prepared in this document. This exercise was undertaken as part of the nationwide curriculum restructuring initiative by the National Educational Policy-2020. Many online and offline meetings both formal and informal meetings were held by the committee taking the inputs from number of colleagues from the universities and colleges, who helped with crucial inputs as to the content of the course. This curriculum is a fresh exercise, but also represents a continuous effort of deliberations with various stake holders.

A graduate is the one who acquires skills of identifying a problem and factors responsible for the problem; acquires and appreciates problem solving skills; logically employs problem solving tools, spatially and temporally; identifies timely needs of the community and contributes to them; takes the community together creating an equitable ecosystem; works towards creating employment opportunities and work domains for different skill sets and knowledge disciplines; blends with various social and economic situations making life happier for the self and of the communities; envisages and employs various attitudes and skill sets for the betterment of the Nation, blending local and regional variations and utilises them to benefit the economy.

Economics is a domain which seamlessly connects the sciences with day-to-day economic demands of the people and policy making issues of the Government. Proposing and developing a curriculum for the subject of Economics is unique in many ways. Hence, a competent subject expert committee was constituted by Karnataka State Higher Education Council, Government of Karnataka. The assigned task of this committee was to design a model curriculum structure and syllabus for both under graduate and post graduate programmes of Economics.

Due efforts are taken to incorporate subject matter that seeks to create students with the ability of the problem-solving critical thinking, analytical thinking, model building, doing estimations, team work and collaboration etc. It is hoped that a student after a rigorous training in the BA/B.Sc. Economics (Hons) degree will have host of employment opportunities and will be an asset to the nation.

ACKNOWLEDGEMENT

The Chairman and Members of the NEP 2020 Curriculum Development Committee in Economics are grateful to Dr. C.N. Ashwathanarayan, Hon'ble Minister for Higher Education, Science and Technology, IT and BT, Skill Development, Government of Karnataka for offering an opportunity to deliberate such vital issue of state importance in the area of Economics and to develop model curriculum.

The Chairman and the Members of the Curriculum Committee are also thankful to Prof. B.Thimme Gowda, Chairman, Task Force Sub-Committee on Curricular Reforms in Higher Education, Vice Chairman, KSHEC, Prof. Gopalakrishna Joshi, Executive Director, KSHEC and the office of KSHEC, Bangalore for their support during the preparation and development of New Curriculum Framework.

The Chairman and the Members of the Curriculum Committee are also thankful to the BOS Chairpersons and members of all the state Universities and all the stake holders who gave their valuable inputs during the preparation of the model structure of the syllabus and model syllabus.

CONTENTS

- **Preamble**
- **Composition of Curriculum Draft Committee for Economics**
- **Preface**
- **Acknowledgement**

Sl.No.	Details	P. No.
1	Executive Summary	
2	Introduction	
3	Need for Curriculum Framework Development	
3	Pedagogy	
4	Exit Options and Credit Requirements	
5	Continuous Internal Evaluation and Semester End Examination	
6	Suggestive Template for IAT	
7	Course Structure for BA and BA Honours and MA with exit options	
8	Course Structure for B.Sc. and B.Sc. Honours and MA with exit options	
9	Syllabus for first two Semesters of BA and BA Honours	
10	Syllabus for first two Semesters of B.Sc. and B.Sc. Honours	

EXECUTIVE SUMMARY

Economics is the study to understand the ways to make accurate choices. By studying economics one can make the efficient choices in managing scarce resources such as money and time. It is not only helpful to increase the standard of living of the individual and their households and also in the policy decisions for the economic development of the Nation. Overall, the objective of Economics is to improve well-being of Indians and thereby developing Indian Economy, since it serves as a centre for developing ideas and innovations.

The economic graduates will be trained to make the best choices among these seemingly infinite possibilities. These rigorously trained economists will play a vital role in the Economic Development of the nation.

The implementation of NEP 2020 has given the great opportunity to make the structure and syllabus of Economics more dynamic and rigorous. Hence the Curriculum committee in Economics has prepared the model structure and syllabus for the first two semesters as the first step towards it.

The committee though has taken the confidence and suggestions of the BOS chairpersons of all the state Universities, it is reiterated that the complete autonomy to the respective BOS of the Universities/Institutes remains intact even as per HEC. The committee has identified different category of courses to be studied by the **Economics Students namely Discipline Specific Core Course (DSCC), Ability Enhancement Courses (AECC), Skill Enhancement Courses (SEC), GE (Generic Electives), Discipline Specific Electives (DSE) etc., by keeping wide choices by considering the present context.**

The members of the committee strongly felt that rigorous training, continuous assessment is the key to improve the quality of the economics students and the fellow fraternity members should leave no stone unturned to ensure it in total.

Introduction

Economics is a popular and much sought-after course owing to its policy relevance and application to business as well as real life situations. However, in the conventional graduate programmes, Economics education was more class-room based with very less practical orientation. Further, with changing technology, emergence of newer issues like uncertainty, pandemics, climate change and business data analytics; the skill requirements are changing. New business models demand newer skills to successfully manage the change. Therefore, keeping in mind the aspirations of the NEP, the emerging skill matrix and the progression of the student at various levels, the Curriculum Committee of Economics finalized the following programme structure to be taught for BA/B.Sc. (Basic and Honors).

Program Outcome

The four-year Bachelor of Arts and Science (B.A./ B.Sc Basic/Honors) in Economics programme and MA/MSc in economics is designed with option for multiple entry and exit. The students will be taught theory as well as the practical aspects of Economic Science. They would begin with fundamental concepts and then as they progress to higher semesters they would be introduced to more sophisticated and intricate concepts.

The main focus would be on conceptual clarity and practical usage of the knowledge gained. To make the students to 'think like an economist' is the main motto of the curriculum. They will also be exposed to quantitative approaches and tools to understand the economic relationships and also to analyse the data for framing as well as evaluating socio-economic policies. With varied electives and approaches to study socio-economic problems and policies, the graduates will be prepared to review and evaluate policies. The whole process aims at making them more inquisitive about the economic phenomena. After graduation, the students can apply their knowledge, skills and competencies across a broad range of occupations. They enjoy a rewarding career in academic, business, corporate, science, health care, government, or any field that uses the information to answer critical questions and inform decision-making.

Learning Objectives

The Graduates will demonstrate:

- ✓ Knowledge of the principles, methodologies, value systems, and thought processes employed in understanding economic behaviour of human beings;
- ✓ Ability to solve problems in microeconomics and macroeconomics;

- ✓ Understanding of contemporary economic issues and the impact of public and social policies to resolve them;
- ✓ Understanding of markets and how they function;
- ✓ Ability to identify, formulate and solve problems related to global, national and local socio-economic development.
- ✓ Ability to design and conduct Social and Behavioural experiments;
- ✓ Ability to design Questionnaires and other Survey tools.
- ✓ Ability to structure and analyse economic data with statistical tools, software and equipment;
- ✓ Ability to critically evaluate academic and policy research in economics;
- ✓ Ability to visualize and work on multidisciplinary tasks;
- ✓ knowledge of professional and ethical responsibilities;
- ✓ Ability to communicate effectively in both verbal and written form;
- ✓ Confidence for self-education and ability for life-long learning.
- ✓ Participation and success in competitive examinations like UPSC/KPSC Civil Services, Indian Economic Services etc.;
- ✓ Ability to prepare and understand simple financial statements

Program Outcomes

The Programme outcomes (POs) are expected to be as under:

- Students will be able to understand economic vocabulary, methodologies, tools and analysis procedures.
- Students will be familiar with the knowledge and application of micro economics for the formulation of policies and planning.
- Students will learn to apply economic theories and concepts to contemporary social issues, as well as analysis of policies.
- Students will be able to understand the impact of government policies and will be able to assess the consequences of the policies on the parties involved.
- As the programme along with economics contains like statistics, mathematics, it enhances them to compute and assess the real situation of the economy including the size and changes of population, income pattern, and rate of development with pattern of savings and investments and social security measures adopted in the country.
- Understand the basics of Quantitative techniques their applications

- Critically evaluate the ongoing economic developments in India and abroad
- Understand research methods in economics
- Student develops an awareness of career choices and the option for higher studies.

NEED FOR CURRICULUM DEVELOPMENT

As per the NEP 2020 initiatives, it is intended to formulate Curriculum to eliminate the disparities among the students studying in different Universities/Institutes. The need for the curriculum development in Economics emerges due to the following reasons

1. **Changing Economic Scenario;** The Indian Economy is witnessing a radical amount of the changes in the economic policies since the introduction of the New Economic policy in 1991, followed by second and third generation reforms. India is not only inviting the FDI but at the same time also promoting Atmanirbhar Abhiyaan (A Self-reliant India). Market economy has expanded creating new opportunities and hence a new economics curriculum is prepared which helps the student to utilize the emerging.
2. **Credit transfer:** Credit transfer is approved by the UGC and the Government that allows the allows students to transfer course from their existing university to a new UGC approved university. The same number of credits in all the Universities in Karnataka is the first step to towards the credit transfer from University to University.
3. **Different Syllabus for BA and BSC in Economics:** All these years the BA and BSC in Economics had the same syllabus and as a path breaking the committee has prepared the separate syllabus for BA and BSC in Economics which suits to the needs of the changing time.
4. **Skill Enhancement:** The new curriculum focuses more on hands on training, internship and thereby enhancing the skills of the students. The papers like data **analytics etc further helps to develop the skills in the students.**

PEDAGOGY

The goal of economics pedagogy is to awaken a student's critical consciousness and empower them with economic tools that helps them in taking the crucial decision which helps them with economic tools through which they can make the efficient choices in managing scarce resources such as resources, money and time.

1. **Importance to theory as well as application:** all these years economics curriculum was concentrating more on teaching theoretical aspects, but the new curriculum gives importance to application through many hands-on training, case studies, empirical studies etc.
2. **Utilisation of ICT:** in order to make the Critical and creative thinking among the students better the ICT tools will be used.it includes case studies of research-led teaching, via presentations, websites and other media
3. **Research-based and research-led teaching:** The theories will be explained with application. In order to give more hands-on training, the Projects and internships are introduced in the economics curriculum. The students will do the research project of their choice under the supervision of the research guide.
4. **Exposure to maths and statistics:** in today's world, economics is using more of statistics and mathematics in economic analysis. Hence the curriculum is designed in such a way which gives more exposure to maths and statistics training.
5. **Brain Storming Approach:** Students will be deliberately involved either in groups or as individuals to deliberately discuss the possible implications or solutions to the Indian economic problems. The teacher will guide the process and help the students to think in right perspective and direction. This will help the teachers understand the extent of the student understanding and take corrective steps, but also helps in student involvement in the curriculum.
6. **Prominence to Indian economic contribution and Indian examples;** The western economic theories was taught ignoring the contribution of Indian economists. The new curriculum also emphasis on the Indian economist contribution, their theories and application. The teachers may highlight the Indian economic contribution and Indian examples in the pedagogy.

Exit Options and Credit Requirements

A Certificate / Diploma/ Bachelor Degree or Bachelor Degree with Honours in Economics both in BA / B.Sc. in Economics is awarded at the completion of every progressive year.

Exit Option with	Certificate/ Diploma/ Degree/ Honors
Successful completion of First year (two semesters) of the four years multidisciplinary undergraduate degree programme.	Certificate in Economics (Arts/ Science)
Successful completion of second year (four semesters) of the four years multidisciplinary undergraduate degree programme	Diploma in Economics (Arts/ Science)
Successful completion of three year (six semesters) of the four years multidisciplinary undergraduate degree programme	Bachelor of Arts/Science Degree in Economics
Successful completion of four year (eight semesters) of the four years multidisciplinary undergraduate degree programme	Bachelor of Arts/ Science Degree with Honours in Economics
Successful completion of Five year (Ten semesters) of the five years multidisciplinary degree programme	Master of Arts/ Science Degree with Honours in Economics

A student will be allowed to enter/re-enter only after the odd semester and they can only exit after even semester. Re-entry at various as lateral academic programmes based on the above mentioned earned proficiency test records.

The validity of the eared credit will be for a maximum period year or as specified by the academic bank of credits (ABC).

CONTINUOUS INTERNAL EVALUATION AND SEMESTER END EXAMINATION

Total marks for each course shall be based on continuous assessments and term end examinations. As per the decision of the Karnataka State Higher Education Council, it is necessary to have uniform pattern of 30: 70 for CIA and Semester End examinations respectively, among all the Universities, their affiliated and autonomous colleges. The committee deliberated on the same and suggested the following pattern for the CIE Marks.

Sl.No.	Parameters for the Evaluation	Marks
Continuous Internal Evaluation (CIE)		
A	Continuous & Comprehensive Evaluation (CCE)	10 Marks
B	Internal Assessment Tests (IAT)	20 Marks
	Total of CIE (A+B)	30 Marks
C	Semester End Examination (SEE)	70 Marks
Total of CIE and SEE (A + B + C)		100 Marks

Evaluation process of IA marks may be as follows:

- The first component (C1), of assessment is for 15 marks. This shall be based on test, assignment, seminar, case study, field work, project work etc. This assessment and score process should be completed after completing 50% of syllabus of the course/s and within the first half of the semester.
- The second component (C2), of assessment is for 15 marks. This shall be based on test, assignment, seminar, case study, field work, internship / industrial practicum / project work etc. This assessment and score process should be based on completion of the remaining 50 percent of syllabus of the courses of the semester.
- During the 17th – 20th week of the semester, a semester end examination of 3 hours duration shall be conducted by the University for each course. This forms the third and final component of assessment (C3) and the maximum marks for the final component will be 70%.
- In case of a student who has failed to attend the C1 or C2 on a scheduled date, it shall be deemed that the student has dropped the test. However, in case of a student who could not take the test on scheduled date due to genuine reasons, such a candidate may appeal to the concerned teacher/ Program Coordinator / HOD and suitable decision taken accordingly.
- For assignments, tests, case study analysis etc., of C1 and C2, the students should bring their own answer scripts (of A4 size), graph sheets etc., required for such tests / assignments and these be stamped by the concerned department using their department seal at the time of conducting tests / assignment / work etc.

The outline for continuous assessment activities for Component-I (C1) and Component-II (C2) of a course shall be as under:

Outline for continuous assessment activities for C1 and C2

Activities	C1	C2	Total Marks
Session Test	10 marks	10 marks	20
Seminars etc.	05 marks		05
Case study / Assignment / Field work / Project work/ Academic Economics Quiz/ Review of the Book/ etc		05 marks	05
Total	15 marks	15marks	30

Suggestive Template for IAT

Internal Assessment Test

BA/B.Sc. and MA/MSc in Economics

Course Code:

Name of the Paper:

Duration: 90 Minutes

Total Marks: 35

SECTION-A

Answer any two of the following questions. Questions for testing conceptual clarity)

(5 X 2= 10)

- 1.
- 2.
- 3.

SECTION- B

Answer any one of the following questions. (Questions for testing the knowledge of theories and application) (10X1= 10)

- 5.
- 6.

SECTION- C

Answer any one of the following questions. Questions for testing the critical ability of understanding) (15X1=15)

- 7.
- 8

Structure of BA/B.Sc., BA/B.Sc Honors and MA/M.Sc.

In

Economics

Acronyms Expanded

AECC	Ability Enhancement Compulsory Course
DSCC	Discipline Specific Core Course
SEC/SB/VB	Skill Enhancement Course- Skill Based/Value Based
OEC	Open Elective Course
DSE	Discipline Specific Elective

B.A PROGRAM

Proposed Scheme of Teaching and Evaluation for B.A (Basic/Hons) with Economics as Major

Semester –I								
Sl No.	Course Code	Title of the Course	Category of Courses	Teaching Hours per Week (L+T+P)	SEE	CIE	Total Marks	Credits
1	Economics-C1	Basic Economics –I	DSC	3+0+0	70	30	100	3
2	Economics-C2	Contemporary Indian Economy	DSC	3+0+0	70	30	100	3
3	Open Electives-Economics	1. Kautilya's Arthshastra 2. Pre-reforms Indian Economy 3. Development Studies	OEC	3+0+0	70	30	100	3
Sub- Total								09

Semester – II								
Sl No.	Course Code	Title of the Course	Category of Courses	Teaching Hours per Week (L+T+P)	SEE	CIE	Total Marks	Credits
1	Economics-C3	Basic Economics -II	DSC	3+0+0	70	30	100	3
2	Economics-C4	Karnataka Economy	DSC	3+0+0	70	30	100	3
3	Open Electives-Economics	1. Contemporary Indian Economy 2. Sustainable Development 3. Economics of Business Environment	OEC	3+0+0	70	30	100	3
Sub- Total								09
Exit option with Certificate (48Credits)								

Semester -III								
Sl No.	Course Code	Title of the Course	Category of Courses	Teaching Hours per Week (L+T+P)	SEE	CIE	Total Marks	Credits
1	Economics-C5	Micro Economics	DSC	3+0+0	70	30	100	3
2	Economics-C6	Mathematical Economics	DSC	3+0+0	70	30	100	3
3	Open Electives-Economics	1. Rural Economics 2. Economics of Insurance 3. Economics of Human Development	OEC	3+0+0	70	30	100	3
Sub- Total								09

Semester -IV								
Sl No.	Course Code	Title of the Course	Category of Courses	Teaching Hours per Week (L+T+P)	SEE	CIE	Total Marks	Credits
1	Economics-C7	Macro Economics	DSC	3+0+0	70	30	100	3
2	Economics-C8	Statistics for Economics	DSC	3+0+0	70	30	100	3
3	Open Electives-Economics	1. Karnataka Economy 2. Entrepreneurial Economics 3. Economics and Law	OEC	3+0+0	70	30	100	3
Sub- Total								25

Exit option with Diploma (96 credits)/ Choose one Discipline as Major, the other as Minor

Semester -V								
Sl No.	Course Code	Title of the Course	Category of Courses	Teaching Hours per Week (L+T+P)	SEE	CIE	Total Marks	Credits
1	Economics -C9	Public Economics	DSC	4+0+0	70	30	100	4
2	Economics -C10	Development Economics	DSC	4+0+0	70	30	100	4
3	Economics	1. Agricultural Economics 2. Industrial Economics 3. Financial Economics (choose 1)	DSE	3+0+0	70	30	100	3
4	Economics	Vocational Course – 1 1. Entrepreneurial Economics 2. Digital Economics	DSC	3+0+0	70	30	100	3
Sub- Total								14

Semester -VI								
Sl No.	Course Code	Title of the Course	Category of Courses	Teaching Hours per week (L+T+P)	SEE	CIE	Total Marks	Credits
1	Economics- C11	International Economics	DSC	4+0+0	70	30	100	4
2	Economics- C12	Indian Public Finance	DSC	4+0+0	70	30	100	4
3	Economics	1. Labour Economics 2. Economics of Non-Farm Sector 3. Tertiary Economics (Choose 1)	DSE	3+0+0	70	30	100	3
4	Economics	Vocational Course – 2 1. Micro Entrepreneurses Development 2. Project Planning & Management (Choose 1)	DSC	3+0+0	70	30	100	3
Sub- Total								14

Exit option with Bachelor of Arts, B.A/ Bachelor of Science, B.Sc. Basic Degree (136 credits)}

Semester -VII								
Sl No.	Course Code	Title of the Course	Category of Courses	Teaching Hours per week (L+T+P)	SEE	CIE	Total Marks	Credits
1	Economics-C13	Advanced Microeconomics	DSC	4+0+0	70	30	100	4
2	Economics-C14	Financial Economics	DSC	4+0+0	70	30	100	4
3	Economics C15	Econometrics	DSC	3+0+0	70	30	100	3
4	Economics	1. Population Studies 2. Urban Economics 3. Economics of Infrastructure (Choose 1)	DSE	3+0+0	70	30	100	3
5	Economics	1. Economics of Governance 2. Gender Economics 3. Economics of Health & Education (Choose 1)	DSE	3+0+0	70	30	100	3
6	B.A 7. 6	Research Methodology for Economics	DSC	2+1+0				3
Sub- Total								20

Semester - VIII								
Sl No.	Course Code	Title of the Course	Category of Courses	Teaching Hours per week (L+T+P)	SEE	CIE	Total Marks	Credits
1	Economics-C16	Economics and Data Analytics	DSC	4+0+0	70	30	100	4
2	Economics-C17	Behavioural Economics	DSC	4+0+0	70	30	100	4
3	Economics C18	Environmental Economics	DSC	3+0+0	70	30	100	3
4	Economics	1. Institutional Economics 2. International Finance 3. Co-operative Economics	DSE	3+0+0	70	30	100	3
5	B.A 8.5	Research Project	-					6
Sub- Total								20

Award of Bachelor of Arts Honours, B.A. (Hons.)/ Bachelor of Science Honours, B.Sc. (Hons) Degree in Economics (176 credits)

Semester -IX

Sl No.	Course Code	Title of the Course	Category of Courses	Teaching Hours per week (L+T+P)	SEE	CIE	Total Marks	Credits
1	Economics-C16	Economic Policy Analysis	DSC	4+0+0	70	30	100	4
2	Economics-C17	Experimental Economics	DSC	4+0+0	70	30	100	4
3	Economics C18	Computer Applications in Economics	DSC	3+0+0	70	30	100	3
4	Economics	1. Economics and Law 2. Global Economic Environment 3. Managerial Economics	DSE	3+0+0	70	30	100	3
5	B.A 8.5	Internship	-					6
Sub- Total								20

Semester - X

Sl No.	Course Code	Title of the Course	Category of Courses	Teaching Hours per week (L+T+P)	SEE	CIE	Total Marks	Credits
1	Economics-C16	Game Theory and its Applications in Economics	DSC	4+0+0	70	30	100	4
2	Economics-C17	Economics of Corporate Finance	DSC	4+0+0	70	30	100	4
3	Economics C18	International Finance	DSC	3+0+0	70	30	100	3
4	Economics	1. Economics of Financial Statement Analysis 2. Stock Market Analysis 3. Economics of Information Communication and Technology	DSE	3+0+0	70	30	100	3
5	B.A 8.5	Research Project	-					6
Sub- Total								20

Award of Master of Arts /Master of Science Degree in Economics (216 credits)

Note:

1. In lieu of the research project, two additional elective papers/ Internship may be offered.
2. One Hour of Lecture is equal to 1 Credit
3. Two Hours of Practical is equal to 1 Credit
4. One Hour of Tutorial is equal to 1 Credit (Except Languages)

Program Structure

Proposed Scheme of Teaching and Evaluation for B. Sc. with Economics as Core Subject

Discipline Core: Economics

Total Credits:

Semester -I

Sl No	Course Code	Title of the Course	Category of Courses	Teaching Hours /Week (L+T+P)	SEE	CIE	Total Marks	Credits
1								
2								
3	Economics-C1	Microeconomics	DSC	3+0+0	70	30	100	3
4	Economics-C2	Mathematics for economics	DSC	3+0+0	70	30	100	3
5								
6								
7	O E 1	4. Kautilya's Arthshastra 5. Development Studies 6. Managerial Economics	OEC	3+0+0	70	30	100	3
8								
Sub- Total								9

Semester -II

Sl No	Course Code	Title of the Course	Category of Courses	Teaching Hours /Week (L+T+P)	SEE	CIE	Total Marks	Credits
1								
2								
3	Economics-C3	Macroeconomics	DSC	3+0+0	70	30	100	3
4	Economics-C4	Statistics for Economics	DSC	3+0+0	70	30	100	3
5								
6								
7	O E 2	4. Contemporary Indian Economy 5. Sustainable Development 6. Economics of Business Environment	OEC	3+0+0	70	30	100	3
8								
9								
Sub- Total								9

Exit option with Certificate (48 credit)

Semester -III								
Sl No.	Course Code	Title of the Course	Category of Courses	Teaching Hours /Week (L+T+P)	SEE	CIE	Total Marks	Credits
1								
2								
3	Economics-C5	Factor pricing and Welfare Economics	DSC	3+0+0	70	30	100	3
4	Economics-C6	Basic Econometrics	DSC	3+0+0	70	30	100	3
5								
6								
7	OE 3	4. Rural Economics 5. Economics of Insurance 6. Economics of Human Development	OEC	3+0+0	70	30	100	3
8								
Sub- Total								9

Semester -IV								
Sl No	Course Code	Title of the Course	Category of Courses	Teaching Hours /Week (L+T+P)	SEE	CIE	Total Marks	Credits
1								
2								
3	Economics-C7	Monetary Economics	DSC	3+0+0	70	30	100	3
4	Economics-C8	Time series Econometrics	DSC	3+0+0	70	30	100	3
5								
6								
7	OE 4	4. Karnataka Economy 5. Entrepreneurial Economics 6. Economics and Law	OEC	3+0+0	70	30	100	3
8								
9								
Sub- Total								9

Exit option with Diploma (96 credits)/ Choose any one Discipline as Major, the other as the Minor

Semester - V								
Sl No	Course Code	Title of the Course	Category of Courses	Teaching Hours /Week (L+T+P)	SEE	CIE	Total Marks	Credits
1	Economics-C9	Public economics	DSC	4+0+0	70	30	100	4
2	Economics-C10	International economics	DSC	4+0+0	70	30	100	4
3	Economics DSE-1 (Choose-1)	1. Environmental Economics 2. Economics of Information 3. Operations Research in Economics	DSE	3+0+0	70	30	100	3
4	Economics DSC-1 (Choose-1)	Vocational Course – 1 1. Entrepreneurial Economics 2. Digital economics	DSC	3+0+0	70	30	100	3
5								
6								
Sub- Total								14

Semester - VI								
Sl No	Course Code	Title of the Course	Category of Courses	Teaching Hours /Week (L+T+P)	SEE	CIE	Total Marks	Credits
1	Economics-C11	Economics of Growth & Development	DSC	4+0+0	70	30	100	4
2	Economics-C12	Indian Economy	DSC	4+0+0	70	30	100	4
3	Economics DSE-2 (Choose-1)	1. Experimental economics 2. Game theory 3. Economics of Artificial Intelligence	DSE	3+0+0	70	30	100	3
4	Economics DSC-2 (Choose-1)	Vocational Course – 2 1. Micro Entrepreneur Development 2. Project Planning & Management	DSC	3+0+0	70	30	100	3
5								
6								
Sub- Total								14

Exit option with Bachelor of Science, B.Sc. Basic Degree (136 credits)}

Semester -VII

Sl No	Course Code	Title of the Course	Category of Courses	Teaching Hours /Week (L+T+P)	SEE	CIE	Total Marks	Credits
1	Economics-C13	Advanced Micro economics	DSC	4+0+0	70	30	100	4
2	Economics-C14	Financial Economics	DSC	4+0+0	70	30	100	4
3	Economics C15	Computer application in economics	DSC	3+0+0	70	30	100	3
4	Economics DSE-3 (Choose-1)	1. Agricultural Economics 2. Health Economics 3. Monetary Economics	DSE	3+0+0	70	30	100	3
5	Economics DSE-4 (Choose-1)	4. Economics of Climate Change 5. Financial Econometrics	DSE	3+0+0	70	30	100	3
6	Economics DSC-3	Research Methodology	DSC	2+1+0				3
<i>Sub- Total</i>								20

Semester -VIII

Sl No	Course Code	Title of the Course	Category of Courses	Teaching Hours /Week (L+T+P)	SEE	CIE	Total Marks	Credits
1	Economics-C16	Advanced Macroeconomics	DSC	4+0+0	70	30	100	4
2	Economics-C17	Economic and Business Analytics	DSC	4+0+0	70	30	100	4
3	Economics C18	Programming with R for Economists	DSC	3+0+0	70	30	100	3
4	Economics DSE-5 (Choose-1)	1. Industrial Economics 2. Economics of Education 3. Economics of Artificial Intelligence and Machine learning	DSE	3+0+0	70	30	100	3
5	Economics DSC-4	Research Project	-					6
Sub- Total								20
Grand Total (I to VIII) (Only Economics)								104

Exit option with Bachelor of Science, B.Sc. Basic (Hons) Degree (176 credits)

Semester -IX									
Sl No.	Course Code	Title of the Course		Category of Courses	Teaching Hours /Week (L+T+P)	SEE	CIE	Total Marks	Credits
1	Economics-C19	International	Trade	DSC	4+0+0	70	30	100	4
2	Economics-C20	Advanced and Finance		DSC	4+0+0	70	30	100	4
3	Economics C21	Advanced	Research	DSC	3+0+0	70	30	100	3
4	Economics DSE-6 (Choose-1)	1. Labour Economics 2. International Finance 3. Stock Market Analysis		DSE	3+0+0	70	30	100	3
5	Economics DSC-5	Internships		DSC					6
Sub- Total									20

Semester -X									
Sl No	Course Code	Title of the Course		Category of Courses	Teaching Hours /Week (L+T+P)	SEE	CIE	Total Marks	Credits
1	Economics -C22	Contemporary	Indian	DSC	4+0+0	70	30	100	4
2	Economics -C23	Advanced	Development	DSC	4+0+0	70	30	100	4
3	Economics C18	Advanced	Public	DSC	3+0+0	70	30	100	3
4	Economics DSE-7 (Choose-1)	1. Behavioral Economics 2. Corporate Finance 3. Big Data Analytics		DSE	3+0+0	70	30	100	3
5	Economics DSC-7	Project Work		-					6
Sub- Total									20
Grand Total (1 to X) (Only Economics)									146

Students who earn 216 credits will get M Sc. in Economics

List of Open Electives

Semester	Open Elective Papers
I	7. Kautilya's Arthshastra 8. Development Studies 9. Managerial Economics
II	7. Contemporary Indian Economy 8. Sustainable Development 9. Economics of Business Environment
III	7. Rural Economics 8. Economics of Insurance 9. Economics of Human Development
IV	7. Karnataka Economy 8. Entrepreneurial Economics 9. Economics and Law

SYLLABUS FOR FIRST TWO SEMESTERS OF BA
AND
BA HONORS
In
ECONOMICS

BA (Hons) Economics
Semester 1

DSC 1.2: Basic Economics – I (Economic Analysis -I) 3 credits

Course Outcomes:

By the end of the course the student will be able to:

1. Identify the facets of an economic problem.
2. Learn basic economic concepts and terms.
3. Explain the operation of a market system;
4. Analyse the production and cost relationships of a business firm;
5. Evaluate the pricing decisions under different market structures; and
6. Use basic cost-benefit calculations as a means of decision making (i.e., thinking like an economist)

Content of Basic Economics 1	42 Hrs
Unit – 1 Basic Concepts in Economics	14
Chapter No. 1 Nature and Scope of Economics <ul style="list-style-type: none"> • Meaning of Economics • Nature of Economics • Scope of Economics • Methods of Economics • Why Study Economics? 	5
Chapter No. 2 Thinking Like an Economist <ul style="list-style-type: none"> • Thinking Like an Economist • The Economist as Scientist • The Economist as Policy Adviser • Economic Policy 	4
Chapter No. 3 Economic System <ul style="list-style-type: none"> • Types of Economic Activities • Organisation of Economic Activities • Circular Flow of Economic Activities • Evolution of the Present Economic Systems Practicum: 1. Group Discussions on Choice Problem 2. Assignment on Types of Economic Systems	5
Unit – 2 Demand, Supply and Markets	14
Chapter No. 4. Firms and Household <ul style="list-style-type: none"> • Meaning of Firms and Household • Relationship Between Firms and Household • Input Markets • Output Markets 	4
Chapter No. 5. Demand and Supply <ul style="list-style-type: none"> • Individual Demand • Market Demand • Demand Determinants • Supply and its Determinants • Market Equilibrium 	5

<p>Chapter No. 6. Elasticity and its Measurement</p> <ul style="list-style-type: none"> • Types of Elasticity of Demand • Price, Income and Cross Elasticities • Measurement of Elasticity of Demand • Determinants of Elasticity of Demand <p>Practicum: 1. Estimation of demand and supply elasticities 2. solving an equilibrium problem</p>	5
<p>Unit – 3 Cost and Market Structures</p>	14
<p>Chapter No. 7 Production and Costs</p> <ul style="list-style-type: none"> • Production Function • Total Production Cost • Marginal Production Cost • Average Production Cost • Revenue Functions 	4
<p>Chapter No. 8. Accounting and Economic Costs</p> <ul style="list-style-type: none"> • Cost in the Short run • Fixed Costs and Variable Costs • Marginal Costs • Long run AC and MC • TR, MR, AR 	5
<p>Chapter No. 9. Market Structures</p> <ul style="list-style-type: none"> • Markets • Perfect and Imperfect Competition • Features of Perfect Competition • Monopoly, Oligopoly and Monopolistic Competition • Pricing Strategies <p>Practicum: 1. Calculation of various costs and comparing them with production concepts; a mini-project can be taken up wherever possible 2. Studying the real-life pricing mechanism through a project/ case studies</p>	5
<p>References (indicative)</p> <ol style="list-style-type: none"> 1. Cohen, A.J. (2020). <i>Macroeconomics for Life: Smart Choices for All? + MyLab Economics with Pearson eText</i> (updated 2nd ed.). Toronto, ON: Pearson Canada Inc. Type: Textbook: ISBN: 9780136716532 2. Cohen, A.J. (2015). <i>Microeconomics for Life: Smart Choices for You + MyLab Economics with Pearson eText</i> (2nd ed.). Toronto, ON: Pearson Canada Inc. Type: Textbook: ISBN: 9780133899368 3. Case Karl E. and Fair Ray C. Principles of Economics, Pearson Education Asia, 2014. 4. Mankiw N. Gregory. Principles of Economics, Thomson, 2013. 5. Stiglitz J.E. and Walsh C.E. Principles of Economics, W.W. Norton & Co, New York, 2011. 	

Semester II

Course Title: DSC 1.3: Contemporary Indian Economy	
Total Contact Hours: 42	Course Credits: 3
Formative Assessment Marks: 30	Duration of ESA/Exam: 3 Hrs
Model Syllabus Authors:	Summative Assessment Marks: 70

Course Pre-requisite(s):

Course Outcomes (COs):

At the end of the course the student should be able to:

- i. Understand the current problems of Indian Economy
- ii. Identify the factors contributing to the recent growth of the Indian economy
- iii. Evaluate impact of LPG policies on economic growth in India
- iv. Analyze the sector specific policies adopted for achieving the aspirational goals
- v. Review various economic policies adopted

Content of Course 1	42 Hrs
Unit – 1 LPG POLICIES, ECONOMIC REFORMS AND AGRICULTURE	14
Chapter No. 1 Recent Issues <ul style="list-style-type: none"> • Genesis and Impact of LPG • India’s population policy • Demographic Dividend • India’s human development in global perspective 	4
Chapter No. 2 Urbanization and governance <ul style="list-style-type: none"> • Urbanization and Smart City Mission • Informal sector • Impact of COVID-19 Pandemic • Atma Nirbhara Bharat Abhiyan 	4
Chapter No. 3 Economic Reforms and Agriculture <ul style="list-style-type: none"> • Agriculture and WTO • Price policy and Subsidies • Commercialisation and Diversification • Public Distribution System • Impact of public expenditure on agricultural growth • Agrarian Crisis, Doubling Farm Incomes, MGNREGS 	6
Practicum <ol style="list-style-type: none"> 1. Mini-project to ascertain the impact of pandemic on lives of different sections of population 2. Field visits to understand the agrarian situation 	
Unit – 2 INDUSTRY, BUSINESS, FISCAL POLICY	14
Chapter No. 4. Industrial Policy <ul style="list-style-type: none"> • New Industrial Policy and changes • Public sector reform • Privatisation and Disinvestment 	4

<ul style="list-style-type: none"> • Competition Policy 	
<p>Chapter No. 5. Business</p> <ul style="list-style-type: none"> • Ease of Doing Business • Performance of MSMEs • Role of MNC's in Industrial Development • Make in India, development of economic and social infrastructure • National Monetization Pipeline <p>(The teacher should include the latest policy of the government)</p> <p>Chapter No. 6. Fiscal Policy</p> <ul style="list-style-type: none"> • Tax, Expenditure, Budgetary deficits • Pension and Fiscal Reforms • Public debt management and reforms • Fiscal Responsibility and Budget Management (FRBM) Act • GST, Fiscal Federalism and Fiscal Consolidation • Recommendations of the Current Finance Commission <p>Practicum: Mini-projects to assess the business climate</p>	5
Unit – 3 MONETARY POLICY, FOREIGN TRADE AND INVESTMENT	
<p>Chapter No. 7 Monetary Policy</p> <ul style="list-style-type: none"> • Organisation of India's money market • Financial sector reforms • Interest rate policy • Review of monetary policy of RBI <p>Chapter No. 8. Money and Capital Markets</p> <ul style="list-style-type: none"> • Working of SEBI in India • Changing roles of the Reserve Bank of India • Commercial banks, • Development Finance Institutions • Foreign banks and Non-banking financial institutions • Analysis of price behaviour in India, Anti-inflationary measures • Demonetization and its impact <p>Chapter No. 9. Foreign Trade and Investment</p> <ul style="list-style-type: none"> • India's foreign trade • India Balance of payment since 1991 • New Exchange Rate Regime: Partial and full convertibility • Capital account convertibility • FDI – Trends and Patterns • New EXIM policy, WTO and India • Bilateral and Multilateral Trade Agreements and Associations <p>Practicum:</p> <ol style="list-style-type: none"> 1. Computation and analysis of Wholesale Price Index, Consumer Price Index: components and trends. 2. Group Discussions on India's trade policies and trade agreements <p>References</p> <ul style="list-style-type: none"> • Bardhan, P.K. (9th Edition) (1999), The Political Economy of Development in India, Oxford University Press, New Delhi. • Bhaduri Amit, (2015), A Model of Development By Dispossession, Fourth Foundation • Byres Terence J. (ed.), (1998), The State, Development Planning and Liberalisation 'in India, Delhi, OUP • Dutt Ruddar and K.P.M Sundaram (2001): Indian Economy, S Chand & Co. Ltd. New 	3 5 6

<p>Delhi.</p> <ul style="list-style-type: none"> • Frankel Francine R., (2004), India's Political Economy, Delhi. OUP Jenkins Rob, 2000, Economic Reform in India, Cambridge, CUP • Jalan, B. (1996), India's Economic Policy- Preparing for the Twenty First Century, Viking, New Delhi. • Joshi Vijaya and L.M.D. Little, (1998), India's Economic Reform 1991-2001, Delhi, OUP. • Kapila Uma: Indian Economy: Policies and Performances, Academic Foundation • Mishra S.K & V.K Puri (2001) "Indian Economy and –Its development experience", Himalaya Publishing House. • Mukharji Rahul (ed.) (2007), India's Economic Transition: The Politics of Reforms, edited by Rahul Mukherji, Oxford University Press , New Delhi. • Stuart and John Harris, (2000), Reinventing India, Cambridge Polity 	
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Pedagogy

Formative Assessment	
Assessment Occasion/ type	Weightage in Marks
Internal Test	50%
Assignment	20%
Presentation/Project	30%
Total	100

Date

Course Co-ordinator

Subject Committee Chairperson

Semester I

Course Title: OEC 1.5: Kautilya's Arthashastra (OEC)	
Total Contact Hours: 42	Course Credits: 3
Formative Assessment Marks: 30	Duration of ESA/Exam: 3 Hrs
Model Syllabus Authors:	Summative Assessment Marks: 70

Course Pre-requisite(s): 12th Standard Pass

Course Outcomes (COs):

At the end of the course the student should be able to:

1. This course will enlighten the students about the ancient fundamentals about political and economic constituents, which will frame out a basic land of understanding the modern trends. This will help them to understand the upcoming needs in the area of policy making for states at national and international level.
2. This treatise deals with the science of Governance, so it projects out all the dimensions needed to be understood by students about the present socio-economic and political rules and regulations of the state.

Unit	Description	Hours
I	Chapter 1: Introduction to the Arthashastra, Chapter 2: Various disciplines of Indian Education System, Chapter 3: Place of Kautilya Arthashastra among them,	2 2 2
II	Chapter 4: Importance of science dealing with governance - Introduction to Tantrayuktis – The methods of preparing a compendium, tools and techniques of writing a compendium. Chapter 5: Governance Procedure- Appointment of the ministers, duties of Government superintendents, treasury, spies, royal writ, punishment- Vakparushya and Dandaparushya; Chapter 6: Laws of Inheritance – Determination of forms of Agreements, determination of legal disputes, Division of inheritance, Special shares in inheritance, Distinction between sons	5 5 5
III	Chapter 7: Economic Dimension- Body of income of the state, collection of revenue, duties of a Chamberlin (koshadhyksha), forty ways of embezzlement of the revenue, punishment for the embezzlement of revenue, expenditure, Loss and Profit, Keeping up the Accounts, Recovery of Debts, Deposits of the state, Resumption of the gifts, Remission of Taxes Chapter 8: Political Dimension- Six-fold Policy- War, Combination of Powers, Agreement of Peace with or without definite terms, Double Policy, Circle of States, Conduct of Corporations, Secret means, Plan of treatise, Chapter 9: Defence and Warfare: Planning of different Vyuhas in War	9 9 3

Suggested readings:

1. Arthashastra of Kautilya by T. Ganapati Shastri, Chaukhambha Surbharti Prakashana, Varanasi,

India, 2005.

2. Arthashastra of Kautilya by Sri. Vacaspati Gairola, Chaukhambha Vidyabahavan, Varanasi, India, 2013.

3. Kautilya, The Arthashastra by L.N. Rangarajan, Penguin Books Ltd, London.

4. Kautilya's Arthashastra: The Way of Financial Management and Economic Governance, Jaico Publishing House, Mumbai, India.

Pedagogy

Formative Assessment	
Assessment Occasion/ type	Weightage in Marks
Internal Test	50%
Assignment	20%
Presentation/Project	30%
Total	100

Date

Course Co-ordinator

Subject Committee Chairperson

Semester 1

Course Title: OEC 1.5: Pre-Reforms Indian Economy (OEC)	
Total Contact Hours: 42	Course Credits: 3
Formative Assessment Marks: 30	Duration of ESA/Exam: 3 Hrs
Model Syllabus Authors:	Summative Assessment Marks: 70

Course Pre-requisite(s): 12th Standard Pass

Course Outcomes (COs):

At the end of the course the student should be able to:

- i. Trace the evolution of Indian Economy
- ii. Identify the structural features and constraints of the Indian economy
- iii. Evaluate planning models and strategy adopted in India
- iv. Analyze the sector specific problems and contributions towards overall economic growth
- v. Review various economic policies adopted

Unit	Description	Hours
I	Features and problems of Indian Economy	15
	Chapter 1: Features of Indian Economy <ul style="list-style-type: none"> • India as a developing economy, • Demographic features • Human Development (HDI), • Problems of Poverty, Unemployment, Inflation, income inequality 	4
	Chapter 2: Issues in Agriculture sector in India <ul style="list-style-type: none"> • Land reforms • Green Revolution • Agriculture marketing in India • Agricultural price policy 	6
	Chapter 3: Industrial and Service Sector <ul style="list-style-type: none"> • Industrial development; • Micro, Small and Medium Enterprises, • Industrial Policy • Performance of public sector in India, • Service sector in India. 	5
	Practicum: 1. Identifying economic problems and their causes; 2. Mini-project on any aspect of Indian agriculture, industry, service and public sectors	
II	Economic Policies	13
	Chapter 4: Planning <ul style="list-style-type: none"> • Mixed Economy • Bombay Plan • Gandhian Model • Nehru Mahalanobis Model • Objectives and achievements of economic planning in India 	5
	Chapter 5: Monetary policy in India <ul style="list-style-type: none"> • Instruments of Monetary Policy 	2

	<ul style="list-style-type: none"> • Black money in India – Magnitude and Impact <p>Chapter 6: Fiscal Policy in India</p> <ul style="list-style-type: none"> • Tax Revenue • Public expenditure • Budgetary deficits • Fiscal reforms • Public debt management and reforms • Centre state Finance Relations and Finance commissions in India. <p>Practicum: Assignment on successes and failures of India’s planning; Monetary and Fiscal Policy instruments</p>	6
III	External sector and Nature of Reforms in India	14
	<p>Chapter 7: India’s foreign trade</p> <ul style="list-style-type: none"> • Salient features • Value, composition and direction of trade • Balance of payments • Goal of self-reliance based on import substitution and protection • Tariff policy • Exchange rate <p>Chapter 8: Post-1991 strategies</p> <ul style="list-style-type: none"> • Stabilisation and structural adjustment packages • Liberalisation Privatisation Globalisation (LPG) Model • Impact of LPG Policies on Indian Economy <p>Chapter 9: NITI Ayog</p> <ul style="list-style-type: none"> • Organization • Functions <p>Practicum: Calculation of BoP and evaluating trade policies; Assignment and group discussion on the impact of LPG Policies</p>	6 6 2
<p>Suggested Readings:</p> <ol style="list-style-type: none"> 1. Dutt Ruddar and K.P.M Sundaram (2001): Indian Economy, S Chand & Co. Ltd. New Delhi. 2. Mishra S.K & V.K Puri (2001) “Indian Economy and –Its development experience”, Himalaya Publishing House. 3. Kapila Uma: Indian Economy: Policies and Performances, Academic Foundation 4. Bardhan, P.K. (9th Edition) (1999), The Political Economy of Development in India, Oxford University Press, New Delhi. 5. Jalan, B. (1996), India’s Economic Policy- Preparing for the Twenty First Century, Viking, New Delhi. 		

Pedagogy

Formative Assessment	
Assessment Occasion/ type	Weightage in Marks
Internal Test	50%
Assignment	20%
Presentation/Project	30%
Total	100

Date

Course Co-ordinator

Subject Committee Chairperson

Semester 1

Course Title: OEC 1.5: Development Studies (OEC)	
Total Contact Hours: 42	Course Credits: 3
Formative Assessment Marks: 30	Duration of ESA/Exam: 3 Hrs
Model Syllabus Authors:	Summative Assessment Marks: 70

Course Pre-requisite(s): *12th Standard Pass*

Course Outcomes (COs):

At the end of the course the student should be able to:

- i. Graduates will be able to excel in higher studies and/or to succeed in profession.
- ii. Graduates will get a solid foundation of fundamentals required to solve socioeconomic problems and also to pursue higher studies.
- iii. Graduates will demonstrate knowledge to appreciate of the dimensions of contemporary development issues, to generate sensitivity to problems concerning ethics and human values to develop orientation towards effective communication and critical analysis, and to appreciate the interrelationships among disciplines as they relate to everyday realities.
- iv. Graduates will cultivate professional and ethical attitude, effective Communication skills, teamwork skills, multidisciplinary approach, and to facilitate an advanced understanding and appreciation of the principles, methodologies, value systems, and thought processes employed in human inquiries.

Unit	Description	Hrs
I	Development: Meaning and Current Challenges	9
	Chapter 1: Meaning of Development <ul style="list-style-type: none"> • The concept of development, • Growth and Development • Transition from quantitative to qualitative indices 	3
	Chapter 2: Modern economic growth <ul style="list-style-type: none"> • Characteristics of modern economic growth • Regional and global disparities • Common characteristics and dissimilarities among developing countries. 	3
	Chapter 3: Current Development Challenges <ul style="list-style-type: none"> • Inequality • Migration • Conflicts Practicum:	3
II	Approaches to Development	12
	Chapter 4: Development Ethics <ul style="list-style-type: none"> • Concept and meaning • Principles and importance of Development Ethics 	2
	Chapter 5: Assessing Development <ul style="list-style-type: none"> • Per capita income • PQLI • Choice and Capabilities • HDI 	4
	Chapter 6: Approaches of Development <ul style="list-style-type: none"> • Adam Smith 	6

	<ul style="list-style-type: none"> • Marx • Schumpeter • Structuralist approach • Neo-liberalism, IMF and structural adjustment • Capabilities Approach Practicum:	
III	Theories and Current Issues in Development	21
	Chapter 7: Theories of Development <ul style="list-style-type: none"> • Theorizing Development - Modernization Theory, Dependency Theory • Capitalist World System • The evolution of thought on poverty reduction • Colonial Regimes and Their Legacies Chapter 8: The Industrial Revolution <ul style="list-style-type: none"> • Genesis and Spread • International specialization of Labour/Industry • Industrial Labour • ILO and its activities to promote labour standards Chapter 9: Environment and development <ul style="list-style-type: none"> • Increasing degradation of natural environment – water and air pollution and deforestation • Depletion of global commons • Sustainable development - concept and measures • SDGs • Climate Change – Causes, Impact, Measures of Mitigation and Adaptations Practicum:	6 5 10

Suggested Readings:

1. Crocker, D. (2008). Ethics and development theory-practice, Ethics of Global Development Agency, Capability, and Deliberative Democracy, 67-106
2. Des Gasper (2008), ‘Denis Goulet and the Project of Development Ethics: Development, 8, 99. 481-9, Elsevier Science, 1, pp.10-26.
3. Drèze, Jean and Amartya Sen(2002), India: Development and Participation, second edition. Oxford: Oxford University Press.
4. Gasper, D. (2004). The ethics of development: From Economism to human development. Edinburgh: Edinburgh University Press
5. Huntington, Samuel (1971), The change to change: Modernization, development and politics. Comparative Politics, 3.
6. Myrdal, Gunnar. (1974), “What is Development?” Journal of Economic Issues 8(4):729-736.
7. Peet, Richard with Elaine Hartwick (2009), Theories of Development: Contentions, Arguments, Alternatives (2nd edition). New York: Guilford.
8. Sen, Amartya (1999) Development as Freedom. New York: Anchor Books.

Pedagogy

Formative Assessment	
Assessment Occasion/ type	Weightage in Marks
Internal Test	50%
Assignment	20%
Presentation/Project	30%
Total	100

Date

Course Co-ordinator

Subject Committee Chairperson

Semester II

Course Title: DSC 2.2: Basic Economics II	
Total Contact Hours: 42	Course Credits: 3
Formative Assessment Marks: 30	Duration of ESA/Exam: 3 Hrs
Model Syllabus Authors:	Summative Assessment Marks: 70

Course Pre-requisite(s): *Basic Economics I*

Course Outcomes (COs):

At the end of the course the student should be able to:

1. Understand the operation of the overall economic system;
2. Calculate national income and related aggregates
3. Explain the relationship between macroeconomic aggregates;
4. Analyse the nature of business cycles and policies towards controlling them;
5. Evaluate the macroeconomic policies for solving major problems like poverty and unemployment

Unit	Description	Hrs
I	Macroeconomic Concepts and Relationships	12
	Chapter 1: Macroeconomy <ul style="list-style-type: none"> • Introduction to National Income Accounting • Concepts of GDP, GNP and national income • Approaches to calculating GDP, personal income, Nominal and real GDP • Limitations of the GDP concept 	5
	Chapter 2: Monetary economy <ul style="list-style-type: none"> • Characteristics • The demand for money • The supply of money and overall liquidity position • credit creation 	4
	Chapter 3: Inflation <ul style="list-style-type: none"> • Meaning and causes of inflation • Calculating inflation rate • Impact of inflation 	3
	Practicum: 1. Understanding the relationships between various NI concepts used in India's NI accounting; 2. Estimating the components of money supply and interpreting the various price indices	
II	Macroeconomic Challenges and Policies	12
	Chapter 4: Macroeconomic challenges <ul style="list-style-type: none"> • Unemployment • Economic Growth • Business Cycles 	3
	Chapter 5: Monetary Policy <ul style="list-style-type: none"> • Objectives • Instruments 	3
	Chapter 6: Fiscal Policy <ul style="list-style-type: none"> • Public finance vs. Private finance • Fiscal functions and role of government: allocation, distribution and stabilisation • Characteristics of public goods, 	6

	<ul style="list-style-type: none"> Rationale of public provision of public goods Practicum: 1. Reviewing the monetary policy of RBI; 2. A project to identify the nature and causes of poverty and the latest central budget	
III	Public Policy and Globalization	18
	Chapter 7: Poverty and public policy	6
	<ul style="list-style-type: none"> Meaning, measurement and types of poverty Poverty alleviation strategies in India 	
	Chapter 8: International Trade	9
	<ul style="list-style-type: none"> The economic basis for trade—absolute advantage and comparative advantage, terms of trade exchange rates Trade Barriers-tariffs, subsidies and quotas Balance of Payments-The current and capital account	
	Chapter 9: Globalization	3
	<ul style="list-style-type: none"> Meaning Importance Pros and cons of Globalization Practicum: Survey on identification of poor; Calculating the components of BoP of India	
References (indicative)		
1. Cohen, A.J. (2020). <i>Macroeconomics for Life: Smart Choices for All? + MyLab Economics with Pearson eText</i> (updated 2 nd ed.). Toronto, ON: Pearson Canada Inc. Type: Textbook: ISBN: 9780136716532		
2. Cohen, A.J. (2015). <i>Microeconomics for Life: Smart Choices for You + MyLab Economics with Pearson eText</i> (2 nd ed.). Toronto, ON: Pearson Canada Inc. Type: Textbook: ISBN: 9780133899368		
3. Case Karl E. and Fair Ray C. Principles of Economics, Pearson Education Asia, 2014.		
4. Mankiw N. Gregory. Principles of Economics, Thomson, 2013.		
5. Stiglitz J.E. and Walsh C.E. Principles of Economics, W.W. Norton & Co, New York, 2011.		

Pedagogy

Formative Assessment	
Assessment Occasion/ type	Weightage in Marks
Internal Test	50%
Assignment	20%
Presentation/Project	30%
Total	100

Date

Course Co-ordinator

Subject Committee Chairperson

Semester II

Course Title: DSC 2.3: Karnataka Economy	
Total Contact Hours: 42	Course Credits: 3
Formative Assessment Marks: 30	Duration of ESA/Exam: 3 Hrs
Model Syllabus Authors:	Summative Assessment Marks: 70

Course Pre-requisite(s):

Course Outcomes (COs):

At the end of the course the student should be able to:

1. Understand the nature of economic growth and problems of Karnataka state.
2. Explain the process of structural growth in Karnataka economy;
3. Evaluate the policies and programmes undertaken by the Govt. of Karnataka for bringing about socio-economic development

Unit	Description	Hours
I	Characteristics of Karnataka Economy	12
	Chapter 1: State Income	2
	<ul style="list-style-type: none"> • State Domestic Product and PCI • Measures to redress regional imbalances 	
	Chapter 2: Human and Natural Resources	6
	<ul style="list-style-type: none"> • Population • Human Development Index • Poverty and Unemployment– Anti-Poverty and Employment generation Programmes • Functioning of Panchayat Raj Institutions 	
	Chapter 3: Natural Resources in Karnataka	4
	<ul style="list-style-type: none"> • Land, Water, Forest and mineral resources in Karnataka Karnataka Sustainable Development Goals • Karnataka environmental Policy 	
	Practicum:	
II	Agriculture and Industries in Karnataka	18
	Chapter 4: Agriculture in Karnataka	9
	<ul style="list-style-type: none"> • Importance of Agriculture • Problems in Agriculture • Land Reforms • Cropping Pattern • Irrigation • Watershed Development • Dry Land Farming • Farmers Suicide – causes and solutions 	
	Chapter 5: Rural Development	3
	<ul style="list-style-type: none"> • Public Distribution System • Rural Development Programmes. 	
	Chapter 6: Industries in Karnataka	6

	<ul style="list-style-type: none"> • Major Industries in Karnataka - Problems and Prospects • MSMEs - Problems and Measures • IT Industries in Karnataka • Industrial Finance in Karnataka • Industrial Policy of Karnataka Practicum:	
III	Infrastructure and Finances	12
	Chapter 7: Infrastructure in Karnataka <ul style="list-style-type: none"> • Transportation: Road, Rail, Water and Air Transport • Information and Communication Technology facilities; Chapter 8: Social Infrastructure <ul style="list-style-type: none"> • Drinking Water, Sanitation • Housing • Health and Education • Social Security in Karnataka Chapter 9: State Finance <ul style="list-style-type: none"> • Sources of Revenue: Direct and Indirect Taxes • GST – Impact and Collections • Sharing of Central Taxes and Grand-in-Aid • Expenditure Sources • States Indebtedness • State Finance Commission • State Budget Practicum:	3 4 5

References (indicative)

1. Government of Karnataka, Economic Survey [Various Issues]
2. Planning Department, Annual Publication, Government of Karnataka.
3. Karnataka at Glance, Annual Publication Government of Karnataka.
4. Madaiah M & Ramapriya. Karnataka Economy Growth: Issues and Development, Himalaya Pub., House, New Delhi.
5. Adul Aziz and K.G. Vasanti. (Eds) Karnataka Economy.
6. Government District Development Reports
7. Hanumantha Rao. Regional Disparities and Development in Karnataka.
8. Krishnaiah Gowda H.R. Karnataka Economy, Spandana Publications, Bangalore
9. Nanjundappa D.M. Some Aspects of Karnataka Economy.
10. Puttaswamiah K. Karnataka Economy, Two Volumes

Pedagogy

Formative Assessment	
Assessment Occasion/ type	Weightage in Marks
Internal Test	50%
Assignment	20%
Presentation/Project	30%
Total	100

Date

Course Co-ordinator

Subject Committee Chairperson

Semester II

Course Title: OEC 2.5: Contemporary Indian Economy	
Total Contact Hours: 42	Course Credits: 3
Formative Assessment Marks: 30	Duration of ESA/Exam: 3 Hrs
Model Syllabus Authors:	Summative Assessment Marks: 70

Course Pre-requisite(s):

Course Outcomes (COs):

At the end of the course the student should be able to:

- vi. Understand the current problems of Indian Economy
- vii. Identify the factors contributing to the recent growth of the Indian economy
- viii. Evaluate impact of LPG policies on economic growth in India
- ix. Analyze the sector specific policies adopted for achieving the aspirational goals
- x. Review various economic policies adopted

Content of Course	42 Hrs
Unit – 1 LPG POLICIES, ECONOMIC REFORMS AND AGRICULTURE	14
Chapter No. 1 Recent Issues <ul style="list-style-type: none"> • Genesis and Impact of LPG • India’s population policy • Demographic Dividend • India’s human development in global perspective 	4
Chapter No. 2 Urbanization and governance <ul style="list-style-type: none"> • Urbanization and Smart City Mission • Informal sector • Impact of COVID-19 Pandemic • Atma Nirbhara Bharat Abhiyan 	4
Chapter No. 3 Economic Reforms and Agriculture <ul style="list-style-type: none"> • Agriculture and WTO • Price policy and Subsidies • Commercialisation and Diversification • Public Distribution System • Impact of public expenditure on agricultural growth • Agrarian Crisis, Doubling Farm Incomes, MGNREGS 	6
Practicum <ol style="list-style-type: none"> 3. Mini-project to ascertain the impact of pandemic on lives of different sections of population 4. Field visits to understand the agrarian situation 	
Unit – 2 INDUSTRY, BUSINESS, FISCAL POLICY	14
Chapter No. 4. Industrial Policy <ul style="list-style-type: none"> • New Industrial Policy and changes • Public sector reform • Privatisation and Disinvestment • Competition Policy 	4

<p>Chapter No. 5. Business</p> <ul style="list-style-type: none"> • Ease of Doing Business • Performance of MSMEs • Role of MNC's in Industrial Development • Make in India, development of economic and social infrastructure • National Monetization Pipeline <p>(The teacher should include the latest policy of the government)</p> <p>Chapter No. 6. Fiscal Policy</p> <ul style="list-style-type: none"> • Tax, Expenditure, Budgetary deficits • Pension and Fiscal Reforms • Public debt management and reforms • Fiscal Responsibility and Budget Management (FRBM) Act • GST, Fiscal Federalism and Fiscal Consolidation • Recommendations of the Current Finance Commission <p>Practicum: Mini-projects to assess the business climate</p>	5
Unit – 3 MONETARY POLICY, FOREIGN TRADE AND INVESTMENT	
<p>Chapter No. 7 Monetary Policy</p> <ul style="list-style-type: none"> • Organisation of India's money market • Financial sector reforms • Interest rate policy • Review of monetary policy of RBI 	3
<p>Chapter No. 8. Money and Capital Markets</p> <ul style="list-style-type: none"> • Working of SEBI in India • Changing roles of the Reserve Bank of India • Commercial banks, • Development Finance Institutions • Foreign banks and Non-banking financial institutions • Analysis of price behaviour in India, Anti-inflationary measures • Demonetization and its impact 	5
<p>Chapter No. 9. Foreign Trade and Investment</p> <ul style="list-style-type: none"> • India's foreign trade • India Balance of payment since 1991 • New Exchange Rate Regime: Partial and full convertibility • Capital account convertibility • FDI – Trends and Patterns • New EXIM policy, WTO and India • Bilateral and Multilateral Trade Agreements and Associations 	6
<p>Practicum:</p>	
<p>3. Computation and analysis of Wholesale Price Index, Consumer Price Index: components and trends.</p>	
<p>4. Group Discussions on India's trade policies and trade agreements</p>	
<p>References</p>	
<ul style="list-style-type: none"> • Bardhan, P.K. (9th Edition) (1999), The Political Economy of Development in India, Oxford University Press, New Delhi. • Bhaduri Amit, (2015), A Model of Development By Dispossession, Fourth Foundation • Byres Terence J. (ed.), (1998), The State, Development Planning and Liberalisation 'in India, Delhi, OUP • Dutt Ruddar and K.P.M Sundaram (2001): Indian Economy, S Chand & Co. Ltd. New Delhi. 	

<ul style="list-style-type: none"> • Frankel Francine R., (2004), India's Political Economy, Delhi. OUP Jenkins Rob, 2000, Economic Reform in India, Cambridge, CUP • Jalan, B. (1996), India's Economic Policy- Preparing for the Twenty First Century, Viking, New Delhi. • Joshi Vijaya and L.M.D. Little, (1998), India's Economic Reform 1991-2001, Delhi, OUP. • Kapila Uma: Indian Economy: Policies and Performances, Academic Foundation • Mishra S.K & V.K Puri (2001) "Indian Economy and –Its development experience", Himalaya Publishing House. • Mukharji Rahul (ed.) (2007), India's Economic Transition: The Politics of Reforms, edited by Rahul Mukherji, Oxford University Press , New Delhi. • Stuart and John Harris, (2000), Reinventing India, Cambridge Polity 	
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Pedagogy

Formative Assessment	
Assessment Occasion/ type	Weightage in Marks
Internal Test	50%
Assignment	20%
Presentation/Project	30%
Total	100

Date

Course Co-ordinator

Subject Committee Chairperson

Semester II

Course Title: OEC 2.5: Sustainable Development Goals	
Total Contact Hours: 42	Course Credits: 3
Formative Assessment Marks: 30	Duration of ESA/Exam: 3 Hrs
Model Syllabus Authors:	Summative Assessment Marks: 70

Course Pre-requisite(s):

Course Outcomes (COs):

At the end of the course the student should be able to:

- i. Understand the basic concept of Sustainable Development (SD), the environmental, social and economic dimensions.
- ii. Know the history of the SD idea.
- iii. Be able to discuss the conflicts which are involved in the SD concept on the national as well as on the global scale.
- iv. Be able to discuss the (dis-)advantages of instruments for SD;
- v. Evaluate the sustainable development goals and their attainments

Unit	Description	Hrs
I	Environment, Development and Pollution	15
	Chapter 1: Meaning Characteristics of Environmental Goods and Services <ul style="list-style-type: none"> • Relationship between Environment and Development • Environmental Kuznets Curve – Meaning and Evidence • Sustainable Development – Meaning and Indicators 	3
	Chapter 2: Resource Use and Management <ul style="list-style-type: none"> • Resource Taxonomy – Renewable and nonrenewable resources • Economic Theory of Depletable Resources • Optimal Use of Renewable Resources • Resource Scarcity and Economic Growth – Limits to Growth Model • Tragedy of Commons and common property Resources • Resource Pricing and Resource Conservation 	6
	Chapter 3: Sustainable Development <ul style="list-style-type: none"> • Definitions, Objectives and Principles • Processes and Indicators of Sustainable Development • Approaches and Strategies for Sustainable Development • Environmental accounting Measures 	6
	Practicum: Miniproject on impact of development on local environment	
II	Sustainable Development Goals	10
	Chapter 4: Introduction and History <ul style="list-style-type: none"> • Brundtland Committee Recommendations • Rio Summit and Agenda 21 • SDGs: Goals, Targets and Indicators 	3
	Chapter 5: Government and the SDGs <ul style="list-style-type: none"> • Planning • Localizing the SDGs • SDG Policy Instruments • Industrial Policies and the SDGs 	4
	Chapter 6: Financing the SDGs	3

	<ul style="list-style-type: none"> Types of financing New financing mechanisms and global funds <p>Practicum: Assignments on Progress in attainment of various SDGs in India and her states</p>	
III	Issues in Implementing SDGs	17
	<p>Chapter 7: Means to Realizing the SDGs</p> <ul style="list-style-type: none"> Degrowth and circular economy Sustainable production and consumption Sustainable cities and transportation Sustainable designs, technology, digital revolution and innovation Renewable energy <p>Chapter 8: Implementing SDGs</p> <ul style="list-style-type: none"> governance and policy tools openness, participation and accountability, effectiveness and coherence; India's framework for sustainable development <p>Chapter 9: Other Issues</p> <ul style="list-style-type: none"> Social business, CSOs, and operations Development Assistance Cross-Border Cooperation <p>Practicum: Group Discussion on case studies on sustainable practices and processes</p>	8
		5
		4

Suggested Readings:

- Baumol, W.J. and W.E. Oates (1988): *The Theory of Environmental Policy* (2e), CUP, Cambridge.
- Bhattacharya, R.N. (Ed): *Environmental Economics: An Indian Perspective*, OUP, New Delhi.
- Dalby, Simon, et al. *Achieving the Sustainable Development Goals: Global Governance Challenges*. Routledge, 2019.
- Day, G.S., and P.J.H. Schoemaker (2011), *Innovating in uncertain markets: 10 lessons for green technologies*, MIT Sloan Management Review, 52.4: 37-45.
- Elliott, Jennifer. *An introduction to sustainable development*. Routledge, 2012.
- Gagnon, B., Leduc, R., and Savard, L., *Sustainable development in engineering: a review of principles and definition of a conceptual framework*. Working Paper 08-18, 2008.
- Hanley, Shogren and White (1997): *Environmental Economics in Theory and Practice*, Macmillan.
- Kolstad, C.D. (1999): *Environmental Economics*, OUP, ND.
- Pearce, D.W. and R. Turner (1991): *Economics of Natural Resource Use and Environment*, John Hopkins Press, Baltimore.
- Sachs, Jeffrey D. *The age of sustainable development*. Columbia University Press, 2015
- Tietenberg, T. (1994): *Environmental Economics and Policy*, Harper Collins, NY.

Pedagogy

Formative Assessment	
Assessment Occasion/ type	Weightage in Marks
Internal Test	50%
Assignment	20%
Presentation/Project	30%
Total	100

Date

Course Co-ordinator

Subject Committee Chairperson

Semester II

Course Title: OEC 2.5: Business Environment	
Total Contact Hours: 42	Course Credits: 3
Formative Assessment Marks: 30	Duration of ESA/Exam: 3 Hrs
Model Syllabus Authors:	Summative Assessment Marks: 70

Course Pre-requisite(s):

Course Outcomes (COs):

At the end of the course the student should be able to:

- i. Explain the elements of Business environment.
- ii. Identify the environmental constraints in the growth of a business firm.
- iii. Analyze the ways to utilize the current environmental conditions to achieve higher business growth.

Unit	Content of Course	42 Hrs
I	Introduction to Business Environment	12
	Chapter 1: Introduction <ul style="list-style-type: none"> • Meaning and definition, objectives, importance and uses of study of business environment. Environmental analysis • Meaning, process of environmental analysis, limitations of environmental analysis, environmental factors • The Micro environment of business and the macro environment of business. 	3
	Chapter 2: Economic Environment <ul style="list-style-type: none"> • Meaning of Economic Environment • Characteristics of Indian economy • Impact of Liberalization Privatization & Globalization of Indian Business. • Monetary policy – Meaning, objectives • Fiscal policy – Meaning, objectives, budget and importance • EXIM policy – meaning and objectives • Industrial policy – meaning, objectives (Latest Policy Measures). 	6
	Chapter 3: Global Business Environment <ul style="list-style-type: none"> • Meaning • Globalization: Nature and Impact of globalization • Challenges of international business • GATT and WTO and its implications on Indian economy. 	3
	Practicum <ol style="list-style-type: none"> 1. Identification of the impact of business environment through surveys 2. Group discussion on WTO and its impact on Indian business 	
II	Non-Economic Environment	10
	Chapter 4: Social and Cultural Environment <ul style="list-style-type: none"> • Business and Society • Social Objectives of Business • Corporate Social Responsibility • Consumer Rights & Corporate Governance • Business Ethics 	4
	Chapter 5: Technological Environment: <ul style="list-style-type: none"> • Meaning 	2

	<ul style="list-style-type: none"> • Technological changes – R & D in India • Public and Private Investment in R and D. <p>Chapter 6: Financial Environment</p> <ul style="list-style-type: none"> • Introduction and Meaning • An Overview of Indian Financial System • Financial Institutions and their Roles • Role of Foreign Direct Investment and its impact on Indian Business <p>Practicum: Students are expected to analyze the major economic and financial indicators such as GDP, Inflation, CPI, BSE, NSE, Currency, Gold rate, Oil barrel price etc., for a particular period of time and submit the report on the same.</p>	4
III	Government and Business in India	22
	<p>Chapter 7: Political Environment</p> <ul style="list-style-type: none"> • Introduction and Meaning • Political Environment and the Economic system • Government and Business Relationship in India • Provisions of Indian Constitution for Business <p>Chapter 8: Legal Environment of Business</p> <ul style="list-style-type: none"> • Indian Company Law • Competition policy and law • Patents & Trademarks • Industrial Policy- An overview • Labor Laws & Social Security, • Environmental Laws. <p>Chapter 9: Current Issues</p> <ul style="list-style-type: none"> • Ease of Doing Business • Performance of MSMEs • Make in India, • Development of economic and social infrastructure • National Monetization Pipeline <p>(The teacher should include the latest policy of the government)</p> <p>Practicum: Students are expected to give a report on how the economic environment has affected the performance of any five large Indian Business Houses.</p>	4 8 10
	<p>REFERENCES: Francis Cherunilam: Business Environment, Himalaya Publishing House, Mumbai. K. V. Sivayya and VBM Das: Indian Industrial Economy, Sulthan Chand Publications, Delhi. M. Adhikari: Economic Environment of Business, Sulthan Chand and Sons, New Delhi. Raj Agarwal: Business Environment, Excel Publications, New Delhi.</p>	

Pedagogy

Formative Assessment	
Assessment Occasion/ type	Weightage in Marks
Internal Test	50%
Assignment	20%
Presentation/Project	30%
Total	100

Date

Course Co-ordinator

Subject Committee Chairperson

SYLLABUS FOR FIRST TWO SEMESTERS OF BS.C
AND
BS.C HONORS
In
ECONOMICS

Name of the Programme: Bachelor of Science (B. Sc)

Course Coe: B. Sc. 1.1

Name of the Course: Microeconomics

Course Credits	Number of Hours per Week	Total No of Teaching Hours
3 Credits	3 Hours	42 Hrs
<p>Course Outcome: On Successful completion of the course, the student will be able to;</p> <ol style="list-style-type: none"> 1. Analyse the economic behaviour of the consumer and the firm 2. Explain the relationship between various variables such as Input and output, cost and output, price of the product and quantity demand and so on 3. Product and Factor pricing under different market structure 		
Unit – 1 : Introduction to Economics, Demand and Supply		14
<p>Chapter-1 introduction to Economics: Nature and scope of economics, Basic Concepts in economics, Importance of study of Economics, Understanding the economy, Mankiw’s ten principles of economics</p>		7
<p>Chapter- 2: Demand: Meaning and Determinants of Demand, the Demand Schedule, The Law of Demand Exceptions to the Law of Demand, Elasticity of Demand: Meaning- Types: Price, Income and Cross Elasticity, Measurement of Elasticity of Demand</p>		6
<p>Chapter- 3: Supply: Concept of Supply, the Law of Supply, and Determinants of Supply.</p>		1
Unit – 2 Theory of Demand and Production function		14
<p>Chapter-4. Cardinal Analysis: Utility: Law of diminishing marginal utility, equi-marginal utility, consumer’s equilibrium, Consumer surplus and its application</p>		3
<p>Chapter-5. Ordinal analysis: Meaning of Indifference curves- Indifference Schedule- Indifference Map, properties of Indifference curves Budget line-Equilibrium position, Income, Price and substitution effects -inferior goods v/s Geffen goods, Samuelson’s revealed preference theory</p>		6
<p>Chapter-6. Production Function Production Function - The Law of Variable Proportion - the Law of Returns to Scale- Least cost combination of Inputs</p>		5
Unit – 3: Cost, Revenue, Price and Output determination under different Markets		14
<p>Chapter No. 7 Cost Concepts, Cost output relationship in the short-run and long-run</p>		4
<p>Chapter No. 8. Concepts of Revenue: Total, Average and Marginal Revenue Curve</p>		1
<p>Chapter No. 9. Price and Output determination under different market: Meaning and features of perfect competitive market, Monopoly, Monopolistic competition and oligopoly, Price and Output determination under these markets</p>		9

Text Books

Ahuja H.L (2017) Advanced Economic Theory, S. Chand and Company, New Delhi.
 Koutsoyiannis A, (2008) Modern Microeconomics, Macmillan, London.

References

Dominick Salvatore (2002) Theory and Problems of Microeconomic Theory, Schaum’s Outline Series, McGraw-Hill Book Company, Singapore.
 Ferguson C.E and Maurice S. Charles, (1978) Economic Analysis-Theory and Applications, Richard D. Irwin Inc. USA.
 Hubbard R. Glenn and Anthony Patrick O’Brien, (2016) Microeconomics, Pearson Prentice Hall, New Jersey.
 Pindyck Robert S., and Daniel L. Rubinfeld, (2012) Microeconomics, Pearson Prentice Hall, New Jersey.
 Varian, H. R., “Intermediate Microeconomics: A Modern Approach”, W. W. Norton and Company, 8th Edition, 2010

Pedagogy: Classroom lecture, tutorials, Seminar and Case analysis

Formative Assessment	
Assessment Occasion/ type	Weightage in Marks
Continuous & Comprehensive Evaluation (CCE)	10 Marks
Internal Assessment Test (IAT)	20 Marks
Semester End Exam (SEE)	70 Marks
Total	100 Marks

Date

Course Co-coordinator

Subject Committee Chairperson

Name of the Programme: Bachelor of Science (B. Sc)

Course Coe: B. Sc. 1.2

Name of the Course: Mathematical for Economics

Course Credits	Number of Hours per Week	Total No of Teaching Hours
3 Credits	3 Hours	42 Hrs
<p>Course Outcome: On Successful completion of the course, the student will be able to;</p> <ol style="list-style-type: none"> 1. Perform basic operations in Vectors and Matrix algebra. 2. Calculate limits, derivatives and integrals of functions of multiple variables. 3. Calculate Optima for constrained and unconstrained optimization problems encountered in Economics. 		
Unit – 1: Basics of Mathematical Economics, Vectors, Matrices and Their applications		14
Chapter-1 Basics of Mathematical Economics: Nature of Mathematical Economics and its applications in Economic Analysis -Mathematical Model: Variables, Constants, Parameters, Equations and Identities- Sets: Set notation, operations, finite and infinite sets, laws of set operations		5
Chapter-2 Relations and Functions: Ordered pairs, relations and functions - Meaning and types of functions- constant function, polynomial functions, rational functions and non-algebraic functions. Simultaneous Equations- Vectors -vector spaces, linear dependence		4
Chapter-3 Matrices: Matrix Operations- Addition and Subtraction, Matrix Multiplication, Commutative, Associative and Distributive laws-Transpose - Inverse Matrix - Determinants: Properties, Rank of Matrix, Minor, Co-factor - Cramer’s Rule, Derivation and its Applications in Economics		5
Unit – 2: Comparative Statics and Derivatives		14
Chapter- 4. Nature of Comparative Statics, Rate of Change and the Derivative -The concept of limit, limit theorems		3
Chapter–5: Continuity and Differentiability of a function – rules of differentiation of a function, Constant Functions, Linear, Power, Sums and Differences of Functions, Product of Functions, Quotient of Functions, Chain Rule, Exponential and Logarithmic Functions		5
Chapter - 6. Functions of Two or More Variables - Partial Derivatives, Higher Order Partial Derivatives, the Chain Rule and Total Derivatives- Maxima and Minima – One and two variables- Differential Equations- First Order Linear Differential Equations- Nonlinear First Order Differential Equations- Second Order Linear Differential Equations		6
Unit – 3: Integration and Optimization Techniques		14
Chapter - 7 Concept of Integration -Rules of Integration – Definite Integrals – Area and summation – Indefinite Integration.		4
Chapter - 8. Applications integrations in Economic Analysis-Consumers Surplus- Producers surplus-Obtaining primitive function from marginal function		5

Text Books

Chiang, A. C. and Wainwright, K., “Fundamental Methods of Mathematical Economics”, McGraw-Hill/Irwin, 4th Edition, 2005.

Sydsaeter, K and Hammond, P., Mathematics for Economic Analysis, Pearson Educational Asia, 4th Edition, 2002.

References

Allen R.G.D., (2015) Mathematical Analysis for Economists, Macmillan.

Bose D., (2003) An Introduction of Mathematical Economics, Himalaya Publishing House, Mumbai.

Sydsaeter, K and Hammond, P., Mathematics for Economic Analysis, Pearson Educational Asia, 4th Edition, 2002.

Dowling, E. T., “Introduction to Mathematical Economics”, McGraw-Hill, 2001.

Hoy, M., Livernois, J. McKenna, C, Rees, R. and Stengos, T., “Mathematics for Economics”, MIT Press, 3rd Edition, 2011

Yamane Taro, (2002) Mathematics for Economists - An Implementer Analysis, Phi Learning Publishers.

Pedagogy: Classroom lecture, tutorials, Problem solving exercise

Formative Assessment	
Assessment Occasion/ type	Weightage in Marks
Continuous & Comprehensive Evaluation (CCE)	10 Marks
Internal Assessment Test (IAT)	20 Marks
Semester End Exam (SEE)	70 Marks
Total	100 Marks

Date

Course Co-coordinator

Subject Committee Chairperson

Name of the Programme: Bachelor of Science (B. Sc)

Course Coe: B. Sc. 2.1

Name of the Course: Macroeconomics

Course Credits	Number of Hours per Week	Total No of Teaching Hours
3 Credits	3 Hours	42 Hrs
<p>Course Outcome: On Successful completion of the course, the student will be able to;</p> <ol style="list-style-type: none"> 1. Explain the concept of National Income and methods of its estimation 2. Analyse the relationship between Macroeconomic variables 3. Understand the determination of income and employment under Classical and Keynesian framework 		
Unit – 1: Introduction to Macroeconomics and National Income accounting		14
<p>Chapter-1: Introduction to Macroeconomics: Nature of Macroeconomics and its significance, Indicators of Macro Economic Activity - Key Concepts: Stock and flow variables.</p>		3
<p>Chapter-2 Building blocks of Macroeconomic Analysis: Aggregate Demand (AD) curve, Aggregate Supply (AS) curve, Sources of shift in AD an AS, Equilibrium in National Income and Price level, Unemployment and National Income, Inflation and Unemployment, Circular flow of Income, Goods market and Money Market</p>		4
<p>Chapter-3 National Income Accounting: Measurement of Macro Variables and Economic Performance: National Income Accounting - <i>Important Concepts:</i> GNP, GDP, NNP, NDP, NI, PI, DPI- Real GDP versus Nominal GDP- GDP deflator- <i>Method of estimating National Income-</i> Expenditure Method- Income method-Value added or Net Product method- Difficulties in National Income Accounting- Trends in GDP in India -GNP and Quality of Life - Net Economic Welfare - Green Income.</p>		7
Unit – 2: Classical and Keynesian Macroeconomics		14
<p>Chapter- 4. Classical Theory: Introduction to classical theory of employment - Basic Assumptions of the Classical School- Say's law of Market- Determinants of Output, Employment, Savings, Investment, Wages, Prices, Interest Rate - Equilibrium Output and Employment-Implications of Classical Full-Employment Model-Critical Evaluation.</p>		5
<p>Chapter - 5. Keynesian Macroeconomics: Principle of effective demand- Keynesian theory of output, income and employment- Equilibrium Income and Output in Simple Two Sector Model, Three Sector & Four Sector Models</p>		4
<p>Chapter- 6: Keyes Psychological law of consumption- An Overview of Post Keynesian theories of consumption: absolute income, relative income, permanent income & life cycle hypothesis- Multiplier and Accelerator Analysis -Marginal Efficiency of Capital- Relevance and Critique of Keynesian Macroeconomics</p>		5
Unit – 3 Recent Debates in Macroeconomics		14

Chapter - 7 Supply side Economics	4
Chapter - 8. Money market and Goods market equilibrium-IS-LM model-Business cycle- Concept and theories	5
Chapter - 9. Macroeconomic policies; Monetary Policy and Fiscal Policy-Relative effectiveness of monetary and fiscal policy	5

Text Books

Ahuja H L (2013) Macroeconomics: Theory and Policy, S Chand & Company Pvt Ltd. New Delhi

Mankiw N. Gregory, (2012) Macroeconomics, Worth Publishers, New York.

Shapiro Edward, (2004) Macroeconomic Analysis, Galgotia Publications Pvt. Ltd, New Delhi.

References

Ackley Gardner, (1978) Macroeconomics: Theory and Policy, Macmillan, New York

Dornbusch, R., Fischer, S. and Startz, R., “Macroeconomics”, McGraw-Hill, 11th Ed 2010

D’Souza E., “Macroeconomics”, Pearson Education, 2009

Froyen Richard T. (2013) Macroeconomics-Theories and Policies, Macmillan Pub., Company, NY.

Hubbard R. Glenn and Anthony Patrick O'Brien, (2012) Macroeconomics, Pearson Prentice, New Jersey, USA.

Oliver Blanchard, (2016) Macroeconomics, Pearson Prentice Hall, New Jersey, USA.

Pedagogy : Classroom lecture, tutorials, Seminar and Case analysis

Formative Assessment	
Assessment Occasion/ type	Weightage in Marks
Continuous & Comprehensive Evaluation (CCE)	10 Marks
Internal Assessment Test (IAT)	20 Marks
Semester End Exam (SEE)	70 Marks
Total	100 Marks

Date

Course Co-coordinator

Subject Committee Chairperson

Name of the Programme: Bachelor of Science (B. Sc)

Course Coe: B. Sc. 2.2

Name of the Course: Statistics for Economics

Course Credits	Number of Hours per Week	Total No of Teaching Hours
3 Credits	3 Hours	42 Hrs
<p>Course Outcome: On Successful completion of the course, the student will be able to;</p> <ol style="list-style-type: none"> 1. Calculate basic descriptive and inferential statistics. 2. Interpret descriptive and inferential statistics. 3. Explain the process of hypothesis testing 		
Unit – 1: Basics of Statistics for economics, Measures of central tendency and dispersion		14
<p>Chapter-1 Basics of Statistics for Economics: Why Study Statistics - Importance of Statistics in Economics- Descriptive and Inferential statistics -Data - Elements, Variables, and Observations, Scales of Measurement - Qualitative and Quantitative Data - Cross-Sectional and Time Series data- Data sources - Computers and Statistical Analysis</p>		4
<p>Chapter-2 Measures of Central Tendency: Arithmetic mean, median, mode, Geometric mean and Harmonic mean measurement and applications in Economics</p>		5
<p>Chapter-3 Measures of dispersion- Meaning and significance of measure of dispersion -Measurement and applications of Range , quartile deviation, mean deviation , standard deviation , variance and coefficient of variation</p>		5
Unit – 2 Correlation, Regression, Time Series Analysis and Index Numbers		14
<p>Chapter- 4. Correlation and Regression: Meaning and types of correlation, methods of computation of correlation coefficient –Karl Pearson’s method, Spearman’s rank correlation method- Regression–meaning and importance of regression analysis, simple regression lines and equations and forecasting (two variables only)</p>		6
<p>Chapter - 5. Time Series: Nature and Decomposition of Time Series - Analysis of Trend - Moving Average Method, Least-Square Method</p>		3
<p>Chapter - 6. Index Numbers: Nature and Purpose of Index Numbers - Types of Index Numbers: Price Index - Quantity Index, Link and Chain Index - Simple and Aggregate Index Numbers -Laspyre’s Index, Paasche’s Index, Marshall and Edgeworth’s Index - Fisher’s Index – Time- Reversal and Factor Reversal Tests-Deflation and Splicing of Index Numbers - Problems in the Construction of Index Numbers - Limitation of Index Numbers.</p>		5
Unit - 3 Introduction to Probability Distributions and Hypothesis Testing		14
<p>Chapter - 7 Probability: Basic Concepts- Properties of Probability- Expected Values, Conditional Probability Random Variables: Discrete and Continuous</p>		3
<p>Chapter - 8. Probability Distributions - Probability Density Functions and Cumulative Distribution Functions – Expected values and Moments - The</p>		6

Binomial Probability Distribution, Poisson and Normal Distribution	
Chapter - 9. Hypothesis Testing: Meaning of Hypothesis testing-Null and Alternative hypothesis, level of significance, One-tailed and two-tailed tests, Type I, Type II errors - Approaches to Hypothesis Testing - Confidence Interval Approach -Test of Significance Approach	5

Text Books

Gupta S P. (2012) *Statistical Methods*, S. Chand and Company, New Delhi.

References

Anderson, Sweeney & Williams, (2002) *Statistics for Business & Economics*, Thomson South-Western, Bangalore.

Daniel and Terrel: *Business Statistics for Management and Economics*; Hoaghton Mifflin Co., Boston, Toronts, 7th Edition, 1995, PP 1 to 972 + 6 Appendices

Medhi, J., *Statistical Methods: An Introductory Text*, Wiley, 1992

Morris H. Degroot and Mark J. Schervish, "Probability and Statistics", 4th edition, 2012.

Teresa Bradley, *Essential Statistics for Economics, Business and Management*, John Willey Publisher, 2007

Pedagogy: Classroom lecture, tutorials, Problem solving exercise

Formative Assessment	
Assessment Occasion/ type	Weightage in Marks
Continuous & Comprehensive Evaluation (CCE)	10 Marks
Internal Assessment Test (IAT)	20 Marks
Semester End Exam (SEE)	70 Marks
Total	100 Marks

Date

Course Co-coordinator

Subject Committee Chairperson

Name of the Programme: Bachelor of Science (B. Sc)

Course Coe: B. Sc. 1.7.3 (OE)

Name of the Course: Managerial for Economics

Course Credits	Number of Hours per Week	Total No of Teaching Hours
3 Credits	3 Hours	42 Hrs
<p>Course Outcome: On Successful completion of the course, the student will be able to;</p> <ol style="list-style-type: none"> Forecast the demand for goods and services Analyse the efficiency of resource use in the production Understand the determination of price and output under different market besides the methods of pricing in practice 		
Content of Course 1		42 Hrs
Unit – 1 Introduction to Managerial economics, Demand analysis and Forecasting		14
<p>Chapter-1: Meaning, nature and scope of Managerial Economics- Organisation of business firms- General Objectives of business firms</p>		3
<p>Chapter-2: Application of Basic Economic Principles to Managerial Problems: Incremental, Discounting, Time Perspective, Opportunity Cost and Equi-Marginal Principle</p>		5
<p>Chapter-3: Demand and its determinants- Elasticity of demand; Meaning, types and determinants-Meaning and Objective Demand Forecasting - Methods of demand forecasting and their usefulness and limitations</p>		6
Unit – 2 : Production Analysis, Cost Analysis and Determination of price		14
<p>Chapter- 4.: Managerial applications of production function- Laws of returns and their applications -Least cost combinations of inputs</p>		
<p>Chapter - 5. Cost concepts and cost function- Cost-output relationship and its usefulness in production decision</p>		
<p>Chapter - 6. Price and output determination in various markets; Perfect competition, monopoly, monopolistic competition and oligopoly</p>		
Unit – 3: Pricing Methods in Practice, Profit Management and Capital Budgeting		14
<p>Chapter – 7: Pricing Methods in Practises: Specific Pricing Problems - Popular Pricing Practices: Cost-Oriented Pricing, Cost-Plus Pricing and Other Price Determinants, Peak - Load Pricing, Price over the Life Cycle of the Product, Penetration Price - Pricing of Multiple Products</p>		5
<p>Chapter – 8: Profit Analysis: Meaning of Profit - Accounting Profit and Economic Profit- Break-Even Analysis - Problems, Break-even Quantity, Break-Even Sales - Targeted Profit, Safety Margin.</p>		5
<p>Chapter – 9: Capital Budgeting: Meaning and Importance - Techniques: Payback Period and Net Present Value (NPV) Method.</p>		4

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Text Books

Salvatore Dominick, (2014) Managerial Economics in a Global Economy, McGraw Hill Inc., New York.

Mehta P.L., (2007) Managerial Economics: Analysis, Problems and Cases, Sultan Chand and Sons, New Delhi.

References

Mc Guigon R. James, R. Charles Moyer, Frederick H Deb, Harris (2017) Managerial Economics: Applications, Strategy and Tactics, South Western, USA

Keat Paul G. and Philip K.Y. Young, (2003) Managerial Economics- Economic Tools for Today's Decision Makers, Prentice Hall, New Jersey.

Petersen H. Craig and W. Cris Lewis, (2006) Managerial Economics, Maxwell Macmillan International Editions, New York.

Samuelson William F, and Stephen G. Marks, (2006) Managerial Economics, John Wiley and Sons, Inc., New Jersey

Pedagogy: Classroom lecture, tutorials, Seminar and Case analysis

Formative Assessment	
Assessment Occasion/ type	Weightage in Marks
Continuous & Comprehensive Evaluation (CCE)	10 Marks
Internal Assessment Test (IAT)	20 Marks
Semester End Exam (SEE)	70 Marks
Total	100 Marks

Date

Course Co-coordinator

Subject Committee Chairperson



Department of Higher education
Karnataka State Higher Education Council
National Education Policy - 2020

**Proposed Model Curriculum for Undergraduate Programme in
Zoology**

In

All state Universities and Colleges in Karnataka

For the year 2021-2022

Submitted by

Zoology/Genetics Subject Committee

NEP 2020

Model Curriculum Structure for Degree Program

B. Sc., Hons in Zoology

Name of the Degree Program: **B. Sc., Hons**

Discipline Core: **Zoology** Total Credits for the Program:**50/100/142/184/268**

Starting year of implementation: **2021-22**

PROGRAM OBJECTIVES (POs)

POs1-The Programme offers both classical as well as modern concepts of Zoology in higher education.

POs2-It enables the students to study animal diversity in both local and global environments.

POs3-To make the study of animals more interesting and relevant to human studies more emphasis is given to branches like behavioural biology, evolutionary biology and economic zoology.

POs4-More of upcoming areas in cell biology, genetics, molecular biology, biochemistry, genetic engineering and bioinformatics have been also included.

POs5-Equal importance is given to practical learning and presentation skills of students.

POs6-The lab courses provide the students necessary skills required for their employability.

POs7-Skill enhancement courses in classical and applied branches of Zoology enhance enterprising skills of students.

POs8-The global practices in terms of academic standards and evaluation strategies.

POs9- Provides opportunity for the mobility of the student both within and across the world.

POs 10-The uniform grading system will benefit the students to move across institutions within India to begin with and across countries.

POs11-It will also enable potential employers in assessing the performance of the candidates across the world.

Credit distribution for the course

*In lieu of the research Project, two additional elective papers/ Internship may be offered

Assessment:

Weightage for assessments (in percentage)

Type of Course	Formative Assessment / IA Marks	Summative Assessment Marks
Theory	40	60
Practical	15	35
Projects	45	105
Experiential Learning (Internships etc.)		

IIA. Model Program Structures for the Under-Graduate Programs in Universities and Colleges in Karnataka

Sem.	Discipline Core (DSC) (Credits) (L+T+P)	Discipline Elective(DSE) / Open Elective (OE) (Credits) (L+T+P)	Ability Enhancement Compulsory Courses (AECC), Languages (Credits) (L+T+P)		Skill Enhancement Courses (SEC)		Total Credits
					Skill based (Credits) (L+T+P)	Value based (Credits) (L+T+P)	
I	Zoology A1(4+2) Botany B1(4+2)	OE-1 (3)	L1-1(3), L2-1(3) (4 hrs. each)		SEC-1: Digital Fluency (2) (1+0+2)	Physical Education for Health & Wellness fitness(1)(0+0+2) (1) (0+0+2)	25
II	Zoology A2(4+2) BotanyB2(4+2)	OE-2 (3)	L1-2(3), L2-2(3) (4 hrs. each)	Environmental Studies (2)		Physical Education - NCC/NSS/R&R(S&	25
Exit option with Certificate (50 credits)							
III	Zoology A3(4+2) Botany B3(4+2)	OE-3 (3)	L1-3(3), L2-3(3) (4 hrs. each)		SEC-2: Artificial Intelligence (2)(1+0+2)	Physical Education- NCC/NSS/R&R(S&	25
IV	Zoology A4(4+2) Botany B4(4+2)	OE-4 (3)	L1-4(3), L2-4(3) (4 hrs. each)	Constitution of India (2)		Physical Education - NCC/NSS/R&R(S&	25
Exit option with Diploma in Science (100 credits) OR Choose any one of the core subjects as Major and the other as Minor							
V	Zoology A5(3+2) Zoology A6(3+2) Botany B5(3+2)	Vocational-1 (3)			SEC-3: SEC such as Cyber Security (2) (1+0+2)		20
VI	Zoology A7(3+2) Zoology A8(3+2) Botany B6(3+2)	Vocational-2 (3) Internship (2)			SEC-4: Professional Communication (2)		22
Exit option with Bachelor of Science Degree, B. Sc. Degree in Zoology (142 credits) or continue studies with the Major in the third year							
VII	Zoology e A9(3+2) Zoology A10(3+2) Zoology A11(3)	Zoology E-1 (3) Zoology E-2 (3) Res. Methodology (3)					22
VIII	Zoology A12(3+2) Zoology A13(3) Zoology A14(3)	Zoology E-3 (3) Research Project (6)*					20
Award of Bachelor of Science Honours Degree, B.Sc.(Hons.) Degree in Zoology (184 credits)							

SEMESTER WISE CURRICULUM STRUCTURE OF COURSES

Semester	Name of the course/credits	What all program outcomes the course addresses (not exceeding three per course)	Pre-requisite course(s)	Concurrent course	Pedagogy	Assessment
1 Semester A1 Major course	Cytology, Genetics and Infectious Diseases (4)	<ol style="list-style-type: none"> The structure and functions of animal cell, cell organelles, cell-cell interactions, process of reproduction leading to new organisms. The principles of inheritance, Mendel's laws and the deviations. Inheritance of chromosomal aberrations in humans by pedigree analysis in families. 	Student must have studied Biology or equivalent subjects in Class 12.	Lab on Cell Biology and Genetics (2)	Lectures/Videos/Seminars/Case study/Project/Group discussion/Problem Solving/Formative Assessment/Summative Assessment	Formative and Summative Assessment/Evaluation/Analysis of result/Application of Heutagogy,
1 Semester B1 Minor course	Biology of Non-Chordates (4)	<ol style="list-style-type: none"> Learn the systematics and biology of non-chordates through their adaptive features. Study the functional biology of non-chordates through their body organization. Comprehend identification of species and their evolutionary relationships. 	Student must have studied Biology or equivalent subjects in Class 12.	Lab on Biology of Non-Chordates (2)	Lectures/Videos/Seminars/Case study/Project/Formative Assessment/Summative Assessment	Formative and Summative Assessment/Evaluation/Analysis of result/Application of Heutagogy,
1 Semester OE1 Open Elective course	Economic Zoology (3)	<ol style="list-style-type: none"> Acquaint the knowledge about basic procedure and methodology of integrated animal rearing. Students can start their own business i.e. self employments. Get employment in different sectors of Applied Zoology 	Student must have studied Biology or equivalent subjects in Class 12.		Lectures/Videos/Seminars/Case study/Project/Group discussion/Problem Solving/Formative Assessment/Summative Assessment	Formative and Summative Assessment/Evaluation/Analysis of result/Application of Heutagogy,

SEC 1 Skill Enhancement course	SEC 1 Digital fluency Vermiculture (2)		Student must have studied Biology or equivalent subjects in Class 12.		Lectures/Videos/Seminars/Case study/Project/Group discussion/Problem Solving/Formative Assessment/Summative Assessment	Formative and Summative Assessment/Evaluation/Analysis of result/Application of Heutagogy,
2 Semester A2 Major course	Biochemistry and Physiology (4)	1. In depth understanding of structure of biomolecules like proteins, lipids and carbohydrates. 2. The thermodynamics of enzyme catalyzed reactions. 3. To know various Physiological processes of animals.	Student must have studied Biology or equivalent subjects in Class 12.	A2 Lab on Biochemistry, Physiology and Hematology (2)	Lectures/Videos/Seminar/Case study/Project/Formative Assessment/Summative Assessment	Formative and Summative Assessment/Evaluation/Analysis of result/Application of Heutagogy,
2 Semester B2 Minor course	Biology of Chordates (4)	1. Learn the systematics and biology of Chordates through their adaptive features. 2. Study the functional biology of Chordates through their body organization. 3. Comprehend identification of Chordate species and their evolutionary relationships.	Student must have studied Biology or equivalent subjects in Class 12.	Lab on Biology of Chordates (2)	Lectures/Videos/Seminar/Case study/Project/Formative Assessment/Summative Assessment	Formative and Summative Assessment/Evaluation/Analysis of result/Application of Heutagogy,
2 Semester OE2 Open Elective course	Parasitology (3)		Student must have studied Biology or equivalent subjects in Class 12.		Lectures/Videos/Seminar/Case study/Project/Formative Assessment/Summative Assessment	Formative and Summative Assessment/Evaluation/Analysis of result/Application of Heutagogy,
2 Skill Enhancement course	Environmental Studies Sericulture (2)	1. Sericulture is an agro-based industry which gives economic empowerment to the students. 2. Sericulture may be taken up as a small scale industry by the small farmers and unemployed youth. 3. Get jobs in teaching profession, silk board and other Govt. institutions as technicians.	Student must have studied Biology or equivalent subjects in Class 12.		Lectures/Videos/Seminar/Case study/Project/Formative Assessment/Summative Assessment	Formative and Summative Assessment/Evaluation/Analysis of result/Application of Heutagogy,

EXIT OPTION WITH CERTIFICATE (50 CREDITS)

3 A3 Major Core Course	Molecular Biology Bioinstrumentation & Techniques in Biology (4)		Certificate Course in Zoology	Lab on Molecular Biology Bioinstrumentation & Techniques in Biology (2)	Lectures/Videos / Seminars/Case study/Project/ Group discussion/Form ative Assessment/ Summative Assessment	Formative and Summative Assessment/Eva luation/Analysis of result/ Application of Heutagogy,
3 B3 Minor Core Course	Comparative Anatomy and Microanatomy (4)		Certificate Course in Zoology	Lab on Comparative Anatomy and Microanatomy (2)	Lectures/Videos / Seminars/Case study/Project/ Group discussion/Form ative Assessment/ Summative Assessment	Formative and Summative Assessment/Ev aluation/ Analysis of result/ Application of Heutagogy,
3 OE-3 Open Elective course	Endocrinology (3)		Certificate Course in Zoology		Lectures/Videos / Seminars/Case study/Project/ Group discussion/Visit to Industry/ Formative Assessment/ Summative Assessment	Formative and Summative Assessment/Eva luation/Analysis of result/ Application of Heutagogy,
3 Semester Skill Enhanceme nt course	SEC 3 Artificial Intelligence Apiculture (2)		Certificate Course in Zoology		Lectures/Videos / Seminars/Case study/Project/ Group discussion/ Visit To Industry/ Formative Assessment/ Summative Assessment	Formative and Summative Assessment/Ev aluation/ Analysis of result/ Application of Heutagogy,
4 A4 Major Core course	Gene Technology, Immunology and Computational Biology (4)		Certificate Course in Zoology	Lab on Genetic Engineering And Counselling (2)	Lectures/Videos / Seminars/Case study/Project/ Group discussion/ Visit to industry/ Formative Assessment/ Summative Assessment	Formative and Summative Assessment/Eval uation/ Analysis of result/ Application of Heutagogy,
4 B4 Minor Core Course	Cell Biology and Genetics (4)		Certificate Course in Zoology	Lab on Cell Biology and Genetics (2)	Lectures/Videos / Seminars/Case study/Project/ Group discussion/Visit to industry/ Formative Assessment/ Summative Assessment	Formative and Summative Assessment/Eval uation/ Analysis of result/ Application of Heutagogy,

4 Sem OE 4 Open Elective Course	Animal Behaviour (3)		Certificate Course in Zoology		Lectures/Videos / Seminars/Case study/Project/ Group discussion/Visit to Industry/ Formative Assessment/ Summative Assessment	Formative and Summative Assessment/Eval uation/ Analysis of result/ Application of Heutagogy,
4 Semester Skill Enhanceme nt course	Constitute of India (2) Poultry		Certificate Course in Zoology		Lectures/Videos / Seminars/Case study/Project/ Group discussion/Visit to Industry/ Formative Assessment/ Summative Assessment	Formative and Summative Assessment/Eval uation/ Analysis of result/ Application of Heutagogy,
EXIT OPTION WITH DIPLOMA (100 CREDITS)						
5 A5 Major Core Course	Non-Chordates and Economic Zoology (4)		Diploma in Zoology	Lab on Non- Chordates and Economic Zoology (2)	Lectures/Videos / Seminars/Case study/Project/ Group discussion/Visit to Zoo/Formative Assessment/ Summative Assessment	Formative and Summative Assessment/Eval uation/ Analysis of result/ Application of Heutagogy,
5 A6 Major Core Course	Chordates and Comparative Anatomy (3)		Diploma in Zoology	Lab on Chordates (Virtual Dissection) and Comparative Anatomy (2)	Lectures/Videos / Seminars/Case study/Project/ Group discussion/Visit to Zoo/ Formative Assessment/ Summative Assessment	Formative and Summative Assessment/Eval uation/ Analysis of result/ Application of Heutagogy,
5 B5 Minor Core Course	Animal Physiology and Animal Biotechnology (3)		Diploma in Zoology	Lab on Animal Physiology and Animal Biotechnology (2)	Lectures/Videos / Seminars/Case study/Project/ Group discussion/Visit to Zoo/ Formative Assessment/ Summative Assessment	Formative and Summative Assessment/Eval uation/ Analysis of result/ Application of Heutagogy,
5 DSEC1	Vocational -1 Aquatic Biology (3)		Diploma in Zoology		Lectures/Videos / Seminars/Case study/Project/ Group discussion/ Visit to Industry/ Formative Assessment/ Summative Assessment	Formative and Summative Assessment/Eval uation/ Analysis of result/ Application of Heutagogy,

5 SEC 3 Skill Enhancement course	Cyber Security Integrated Animal Rearing (2)		Diploma in Zoology		Lectures/Videos / Seminars/Case study/Project/ Group discussion/Visit to Industry/Formative Assessment/ Summative Assessment	Formative and Summative Assessment/Evaluation/ Analysis of result/ Application of Heutagogy,
6 A7 Major Core Course	Evolutionary and Developmental Biology (3)		Diploma in Zoology	Lab on Evolutionary and Developmental Biology (2)	Lectures/Videos / Seminars/Case study/Project/ Group discussion/Visit to Institute/Formative Assessment/ Summative Assessment	Formative and Summative Assessment/Evaluation/ Analysis of result/ Application of Heutagogy
6 A8 Major Core Course	Environmental Biology, Wildlife management and Conservation (3)		Diploma in Zoology	Lab on Environmental Biology, Wildlife management and Conservation (2)	Lectures/Videos / Seminars/Case study/Project/ Group discussion/Visit to Zoo/Formative Assessment/ Summative Assessment	Formative and Summative Assessment/Evaluation/ Analysis of result/ Application of Heutagogy
6 B6 Minor Core Course	Animal Behaviour (3)		Diploma in Zoology	Lab on Animal Behaviour (2)	Lectures/Videos / Seminars/Case study/Project/ Group discussion/Visit to Zoo/Formative Assessment/ Summative Assessment	Formative and Summative Assessment/Evaluation/ Analysis of result/ Application of Heutagogy
6 DSEC	Vocational-2 Entomology 3 Internship (2)		Diploma in Zoology		Lectures/Videos / Seminars/Case study/Project/ Group discussion/Visit to Industry/ Formative Assessment/ Summative Assessment	Formative and Summative Assessment/Evaluation/ Analysis of result/ Application of Heutagogy
6 Skill Enhancement Course	SEC 4 Professional Communication Ornamental Fish Culture (2)		Diploma in Zoology		Lectures/Videos / Seminars/Case study/Project/ Group discussion/Visit to Industry/ Formative Assessment/ Summative Assessment	Formative and Summative Assessment/Evaluation/ Analysis of result/ Application of Heutagogy

EXIT OPTION WITH B. Sc. DEGREE (142 CREDITS)

7 A9 Major Core Course	Ethology (3)		Degree in Bachelor Of Science in Zoology	Lab on Ethology @2)	Lectures/Videos / Seminars/Case study/Project/ Group discussion/Visit to Zoo/ Formative Assessment/ Summative Assessment	Formative and Summative Assessment/Eval uation/ Analysis of result/ Application of Heutagogy,
7 A8 Major Core Course	Evolution and Zoogeography (3)		Degree in Bachelor Of Science in Zoology	Lab on Evolution and Zoogeography (2)	Lectures/Videos / Seminars/Case study/Project/ Group discussion/Visit to Zoo/ Formative Assessment/ Summative Assessment	Formative and Summative Assessment/Eval uation/ Analysis of result/ Application of Heutagogy
7 A9 Major Core Course	Genetics and Computational Biology (3)		Degree in Bachelor Of Science in Zoology	Lab on Advanced Genetics and Computational Biology (2)	Lectures/Videos / Seminars/Case study/Project/ Group discussion/Visit to Industry/ Formative Assessment/ Summative Assessment	Formative and Summative Assessment/Eval uation/ Analysis of result/ Application of Heutagogy
7	RESEARCH METHODOLO GY (3)		Degree in Bachelor Of Science in Zoology		Lectures/Videos / Seminars/Case study/Project/ Group discussion/Visit to research lab/Formative Assessment/ Summative Assessment	Formative and Summative Assessment/Eval uation/ Analysis of result/ Application of Heutagogy
7 DSEC	Zoology E-1 (3) Radiation Biology		Degree in Bachelor Of Science in Zoology		Lectures/Videos / Seminars/Case study/Project/ Group discussion/Visit to Industry/ Formative Assessment/ Summative Assessment	Formative and Summative Assessment/Ev aluation/ Analysis of result/ Application of Heutagogy,
7DSEC	Zoo Management Zoology E-2 (3)		Degree in Bachelor Of Science in Zoology		Lectures/Videos / Seminars/Case study/Project/ Group discussion/Visit to Industry/ Formative Assessment/ Summative Assessment	Formative and Summative Assessment/Ev aluation/ Analysis of result/ Application of Heutagogy,

8 A12 Major Core Course	Immunology and Stem Cell Biology (3)		Degree in Bachelor Of Science in Zoology	Lab on Immunology and Stem Cell Biology 2	Lectures/Videos / Seminars/Case study/Project/ Group discussion/Visit to Industry/ Formative Assessment/ Summative Assessment	Formative and Summative Assessment/Ev aluation/ Analysis of result/ Application of Heutagogy,
8 A13 Major Core Course	Advanced Molecular Biology and Biostatistics (3)		Degree in Bachelor Of Science in Zoology		Lectures/Videos / Seminars/Case study/Project/ Group discussion/Visit to Industry/ Formative Assessment/ Summative Assessment	Formative and Summative Assessment/Ev aluation/ Analysis of result/ Application of Heutagogy,
8 A 14 Major Core Course	Genomics and Proteomics (3)		Degree in Bachelor Of Science in Zoology		Lectures/Videos / Seminars/Case study/Project/ Group discussion/Visit to Industry/ Formative Assessment/ Summative Assessment	Formative and Summative Assessment/Ev aluation/ Analysis of result/ Application of Heutagogy,
8	RESEARCH PROJECT (6)		Degree in Bachelor Of Science in Zoology		Lectures/Videos / Seminars/Case study/Project/ Group discussion/Visit to Industry/ Formative Assessment/ Summative Assessment	Formative and Summative Assessment/Eval uation/ Analysis of result/ Application of Heutagogy
8DSEC1	<i>Any one of the below 4 choice</i> E-3 Neurosciences (3)		Degree in Bachelor Of Science in Zoology		Lectures/Videos / Seminars/Case study/Project/ Group discussion/Visit to Industry/ Formative Assessment/ Summative Assessment	Formative and Summative Assessment/Ev aluation/ Analysis of result/ Application of Heutagogy,
8DSEC2	E-3 Parasitology(3)		Degree in Bachelor Of Science in Zoology		Lectures/Videos / Seminars/Case study/Project/ Group discussion/Visit to Industry/ Formative Assessment/ Summative Assessment	Formative and Summative Assessment/Ev aluation/ Analysis of result/ Application of Heutagogy,
8DSEC3	E-3 Animal Experimentation and Ethics(3)		Degree in Bachelor Of Science in Zoology		Lectures/Videos / Seminars/Case study/Project/ Group discussion/Visit to Industry/ Formative Assessment/ Summative Assessment	Formative and Summative Assessment/Ev aluation/ Analysis of result/ Application of Heutagogy,

8DSEC4	E-3 Behavioural Biology(3)		Degree in Bachelor Of Science in Zoology		Lectures/Videos / Seminars/Case study/Project/ Group discussion/Visit to Industry/ Formative Assessment/ Summative Assessment	Formative and Summative Assessment/Evaluation/ Analysis of result/ Application of Heutagogy,
EXIT OPTION WITH B. Sc. HONOURS DEGREE (184 CREDITS)						
9 A15 Major Core Course	Animal Biotechnology and Genetic Engineering (3)		Degree in Bachelor of Science Honors	Lab on Animal Biotechnology and Genetic Engineering (2)	Lectures/Videos / Seminars/Case study/Project/ Group discussion/Visit to Industry/ Formative Assessment/ Summative Assessment	Formative and Summative Assessment/Evaluation/ Analysis of result/ Application of Heutagogy,
9 A 16 Major Core Course	Microanatomy Histochemistry and Histopathology (3)		Degree in Bachelor of Science Honors	Lab on Microanatomy, Histochemistry and Histopathology (2)	Lectures/Videos / Seminars/Case study/Project/ Group discussion/Visit to Industry/ Formative Assessment/ Summative Assessment	Formative and Summative Assessment/Evaluation/ Analysis of result/ Application of Heutagogy
9 A 17 Major Core course	Molecular Endocrinology (3)		Degree in Bachelor of Science Honors	Lab on Molecular Endocrinology (2)	Lectures/Videos / Seminars/Case study/Project/ Group discussion/Visit to Lab/ Formative Assessment/ Summative Assessment	Formative and Summative Assessment/Evaluation/ Analysis of result/ Application of Heutagogy,
9 A18	Research methodology (3) of 7 th sem) Applied Zoology (In Place of		Degree in Bachelor of Science Honors		Lectures/Videos / Seminars/Case study/Project/ Group discussion/Visit to Industry/ Formative Assessment/ Summative Assessment	Formative and Summative Assessment/Evaluation/ Analysis of result/ Application of Heutagogy,
9DSEC1	E-1 Animal Biotechnology (3)		Degree in Bachelor of Science Honors		Lectures/Videos / Seminars/Case study/Project/ Group discussion/Visit to Industry/ Formative Assessment/ Summative Assessment	Formative and Summative Assessment/Evaluation/ Analysis of result/ Application of Heutagogy,

9DSEC2	E-1 Toxicology (3)		Degree in Bachelor of Science Honors		Lectures/Videos / Seminars/Case study/Project/ Group discussion/Visit to Industry/ Formative Assessment/ Summative Assessment	Formative and Summative Assessment/Evaluation/ Analysis of result/ Application of Heutagogy,
9 Skill Enhancement Course	Cattle Farming (3)		Degree in Bachelor of Science Honors		Lectures/Videos / Seminars/Case study/Project/ Group discussion/Visit to Industry/ Formative Assessment/ Summative Assessment	Formative and Summative Assessment/Evaluation/ Analysis of result/ Application of Heutagogy,
10 A 19 Major	Physiology of Reproduction (3)		Degree in Bachelor of Science Honors	Lab on Reproductive Physiology 2	Lectures/Videos / Seminars/Case study/Project/ Group discussion/Visit to Industry/ Formative Assessment/ Summative Assessment	Formative and Summative Assessment/Evaluation/ Analysis of result/ Application of Heutagogy,
10 A 20 Major	Developmental Biology (3)		Degree in Bachelor of Science Honors		Lectures/Videos / Seminars/Case study/Project/ Group discussion/Visit to Industry/ Formative Assessment/ Summative Assessment	Formative and Summative Assessment/Evaluation/ Analysis of result/ Application of Heutagogy,
10 A 21 Major	Chronobiology (3)		Degree in Bachelor of Science Honors		Lectures/Videos / Seminars/Case study/Project/ Group discussion/Visit to Lab/Formative Assessment/ Summative Assessment	Formative and Summative Assessment/Evaluation/ Analysis of result/ Application of Heutagogy,
10 A 22	Nano Biotechnology (3)		Degree in Bachelor of Science Honors		Lectures/Videos / Seminars/Case study/Project/ Group discussion/Visit to Industry/ Formative Assessment/ Summative Assessment	Formative and Summative Assessment/Evaluation/ Analysis of result/ Application of Heutagogy,

10 DSEC 1	RESEARCH PROJECT or Any two DSEC Or INTERNSHIP (6)		Degree in Bachelor of Science Honors		Lectures/Videos / Seminars/Case study/Project/ Group discussion/Visit to Industry/ Formative Assessment/ Summative Assessment	Formative and Summative Assessment/Evaluation/ Analysis of result/ Application of Heutagogy,
10 DSEC 2	E-3 Insect Vector & Diseases (3)		Degree in Bachelor of Science Honors		Lectures/Videos / Seminars/Case study/Project/ Group discussion/Visit to Industry/ Formative Assessment/ Summative Assessment	Formative and Summative Assessment/Evaluation/ Analysis of result/ Application of Heutagogy,
10 DSEC 3	E-3 Human Physiology (3)		Degree in Bachelor of Science Honors		Lectures/Videos/ Seminars/Case study/Project/ Group discussion/Visit to Industry/ Formative Assessment/ Summative Assessment	Formative and Summative Assessment/Evaluation/ Analysis of result/ Application of Heutagogy,
10 DSEC 4	E-3 Food, Nutrition & Health (3)		Degree in Bachelor of Science Honors		Lectures/Videos / Seminars/Case study/Project/ Group discussion/Visit to Industry/ Formative Assessment/ Summative Assessment	Formative and Summative Assessment/Evaluation/ Analysis of result/ Application of Heutagogy,
10 Skill Enhancement	E-3 Animal Breeding Techniques (3)		Degree in Bachelor of Science Honors		Lectures/Videos / Seminars/Case study/Project/ Group discussion/Visit to Industry/ Formative Assessment/ Summative Assessment	Formative and Summative Assessment/Evaluation/ Analysis of result/ Application of Heutagogy,

**Proposed Course content under New Education Policy Year 2021-22 for
I Semester BSc Zoology
Core Course Content**

Course Title/Code: Cytology, Genetics and Infectious Diseases	Course Credits: 4
Course Code: DSCC5Z00T1	L-T-P per week: 4-0-0
Total Contact Hours: 56	Duration of ESA: 3 Hours
Formative Assessment Marks: 40	Summative Assessment Marks: 60
Model Syllabus Authors:	

Core Course prerequisite: To study Zoology in undergraduate, student must have studied Biology or equivalent subject in Class 12.

Course Outcomes (COs):

At the end of the course the student should be able to understand:

1. The structure and function of the cell organelles.
2. The chromatin structure and its location.
3. The basic principle of life, how a cell divides leading to the growth of an organism and also reproduces to form a new organisms.
4. How a cell communicates with its neighboring cells.
5. The principles of inheritance, Mendel's laws and the deviations.
6. How environment plays an important role by interacting with genetic factors.
7. Detect chromosomal aberrations in humans and study of pedigree analysis.

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs)

Course Outcomes (COs) / Program Outcomes (POs)	CC T1	CC 2	CC 3	CC 4	CC 5	CC 6	CC 7	CC 8	CC 9	CC 10	CC 11
I Core competency	X										
II Critical thinking	X										
III Analytical reasoning	X										
IV Research skills	X										
V Team work	X										

Note: Course Articulation Matrix relates course outcomes of course with the corresponding program outcomes whose attainment is attempted in this course. Mark 'X' in the intersection cell if a course outcome addresses a particular program outcome.

Semester I- Zoology Core Course I Content:

Content	Hours
Unit I	14
Chapter 1. Structure and Function of Cell Organelles I in Animal cell Chapter 2 Plasma membrane: chemical structure—lipids and proteins Chapter 3 Endomembrane system: protein targeting and sorting, transport, endocytosis and exocytosis	
Chapter 2. Structure and Function of Cell Organelles II in Animal Cell <ul style="list-style-type: none"> • Cytoskeleton: microtubules, microfilaments, intermediate filaments • Mitochondria: Structure, oxidative phosphorylation; electron transport system • Peroxisome and Ribosome: structure and function 	
Unit II	14
Chapter 3. Nucleus and Chromatin Structure <ul style="list-style-type: none"> • Structure and function of nucleus in eukaryotes • Chemical structure and base composition of DNA and RNA • DNA supercoiling, chromatin organization, structure of chromosomes • Types of DNA and RNA 	
Chapter 4. Cell cycle, Cell Division and Cell Signaling <ul style="list-style-type: none"> • Cell division: mitosis and meiosis • Introduction to Cell cycle and its regulation, apoptosis • Signal transduction: intracellular signaling and cell surface receptors, via G-protein linked receptors • Cell-cell interaction: cell adhesion molecules, cellular junctions 	

Unit III	14
Chapter 5. Mendelism and Sex Determination <ul style="list-style-type: none"> • Basic principles of heredity: Mendel's laws- monohybrid cross and hybrid cross • Complete and Incomplete Dominance • Penetrance and expressivity • Genetic Sex-Determining Systems, Environmental Sex Determination, Sex Determination and mechanism in <i>Drosophila melanogaster</i>. • Sex-linked characteristics in humans and dosage compensation 	
Chapter 6. Extensions of Mendelism, Genes and Environment <ul style="list-style-type: none"> • Extensions of Mendelism: Multiple Alleles, Gene Interaction. • The Interaction Between Sex and Heredity: Sex-Influenced and Sex-Limited Characteristics • Cytoplasmic Inheritance, Genetic Maternal Effects. • Interaction between Genes and Environment: Environmental Effects on Gene Expression, Inheritance of Continuous Characteristics. 	
Unit IV	14
Chapter 7. Human Chromosomes and Patterns of Inheritance <ul style="list-style-type: none"> • Patterns of inheritance: autosomal dominance, autosomal recessive, X-linked recessive, X-linked dominant. • Chromosomal anomalies: Structural and numerical aberrations with examples. • Human karyotyping and Pedigree analysis. 	
Chapter 8. Infectious Diseases <ul style="list-style-type: none"> • Introduction to pathogenic organisms: viruses, bacteria, fungi, protozoa and worms. • Structure, life cycle, pathogenicity, including diseases, causes, symptoms and control of common parasites: <i>Trypanosoma, Giardia and Wuchereria</i>. 	

Suggested Readings :

1. Lodish et al: Molecular Cell Biology: Freeman & Co, USA(2004).
2. Alberts et al: Molecular Biology of the Cell: Garland(2002).
3. Cooper: Cell: A Molecular Approach: ASM Press(2000).
4. Karp: Cell and Molecular Biology: Wiley (2002). Pierce B. Genetics. Freeman(2004).
5. Lewin B. Genes VIII. Pearson (2004).
6. Watson et al. Molecular Biology of the Gene. Pearson(2004).
7. Thomas J. Kindt, Richard A. Goldsby, Barbara A. Osborne, Janis Kuby- Kuby Immunology. W HFreeman (2007).
8. Delves Peter J., Martin Seamus J., Burton Dennis R., Roitt Ivan M. Roitt's Essential Immunology, 13th Edition. Wiley Blackwell(2017).
9. Principles of Genetics by B. D. Singh
10. Cell-Biology by C. B. Pawar, Kalyani Publications
11. Economic Zoology by Shukla and Upadhyaya

Pedagogy: Written Assignment/Presentation/Project / TermPapers/Seminar

Formative Assessment	
Assessment Occasion	Weightage in Marks
House Examination/Test	20
Written Assignment/Presentation/Project / Term Papers/Seminar	15
Class performance/Participation	05
Total	40

Date: Co-ordinator

Subject Committee Chairperson

Zoology Core Lab Course Content

Semester I

Course Title: Cell Biology & Cytogenetics Lab	Course Credits: 2
Course Code: DSCC5Z00P1	L-T-P per week: 0-0-4
Total Contact Hours: 56	Duration of ESA: 3 Hours
Formative Assessment Marks: 15	Summative Assessment Marks: 35
Model Syllabus Authors:	

Course Outcomes (COs):

At the end of the course the student should be able to:

1. To use simple and compound microscopes.
2. To prepare stained slides to observe the cell organelles.
3. To be familiar with the basic principle of life, how a cell divides leading to the growth of an organism and also reproduces to form new organisms.
4. The chromosomal aberrations by preparing karyotypes.
5. How chromosomal aberrations are inherited in humans by pedigree analysis in families.
The antigen-antibody reaction.

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs)

Course Outcomes (COs) / Program Outcomes (POs)	CC P1	CC 2	CC 3	CC 4	CC 5	CC 6	CC 7	CC 8	CC 9	CC 10	CC 11
I Core competency	X										
II Critical thinking	X										
III Analytical reasoning	X										
IV Research skills	X										
V Team work	X										

Note: Course Articulation Matrix relates course outcomes of course with the corresponding program outcomes whose attainment is attempted in this course. Mark 'X' in the intersection cell if a course outcome addresses a particular program outcome.

Lab Course Content

List of labs to be conducted	56 hrs.
<ol style="list-style-type: none"> 1. Understanding of simple and compound microscopes. 2. To study different cell types such as buccal epithelial cells, neurons, striated muscle cells using 3. Methylene blue/any suitable stain (virtual/ slaughtered tissue). 3. To study the different stages of Mitosis in root tip of <i>Allium cepa</i>. 4. To study the different stages of Meiosis in grasshopper testis (virtual). 5. To check the permeability of cells using salt solution of different concentrations. 6. Study of parasites in humans (e.g. Protozoans, Helminthes in compliance with examples being studied in theory) permanent microslides. 7. To learn the procedures of preparation of temporary and permanent stained slides, with available mounting material. 8. Study of mutant phenotypes of <i>Drosophila</i> sp. (from Cultures or Photographs). 9. Preparation of polytene chromosomes (Chironomus larva or Drosophila larva). 10. Preparation of human karyotype and study the chromosomal structural and numerical aberrations from the pictures provided. (Virtual/optional). 11. To prepare family pedigrees. 12. https://www.vlab.co.in 13. https://zoologysan.blogspot.com 14. www.vlab.iitb.ac.in/vlab 15. www.onlinelabs.in 16. www.powershow.com 17. https://vlab.amrita.eduhttps://sites.dartmouth.edu/ 	

Suggested Readings:

1. Lodish et al: Molecular Cell Biology: Freeman & Co, USA(2004).
2. Alberts et al: Molecular Biology of the Cell: Garland(2002).
3. Cooper: Cell: A Molecular Approach: ASM Press(2000).
4. Karp: Cell and Molecular Biology: Wiley (2002). Pierce B. Genetics. Freeman(2004).
5. Thomas J. Kindt, Richard A. Goldsby, Barbara A. Osborne, Janis Kuby- Kuby Immunology. W H Freeman(2007).
6. Kesar, Saroj and Vasishta N.2007 Experimental Physiology: Comprehensive Manual. Heritage Publishers, NewDelhi.

Pedagogy: Written Assignment/Presentation/Project / Term Papers/Seminar

Formative Assessment	
Assessment Occasion	Weightage in Marks
House Examination/Test	05
Written Assignment/Presentation/Project / Term Papers/Seminar	05
Class performance/Participation	05
Total	15

Date:

Course Co-ordinator

Subject committee Chairperson

Minor Course Content

Semester: **I Semester, B. Sc., (Hons) Zoology**

Course Title: BIOLOGY OF NON-CHORDATES	Course Code: MDC5ZOOT1
Course Type: Minor Discipline Core Theory, L-T-P: 4-0-0	Course Credits: 4
Total Contact Hours: 56	Duration of ESA: 3 Hrs
Formative Assessment Marks: 40	Summative Assessment Marks: 60
Model Syllabus Authors:	

Course Outcomes (COs):

At the end of the course the student should be able to:

1. Learn the structural biology of non-chordates through their adaptive features.
2. Study the functional biology of non-chordates through their body organization and its function.
3. Comprehend identification of species and their evolutionary relationships.
4. Enhancement of research skills like critical thinking.
5. Develop abilities required for industrial employment as well as self-employment.

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs)

Course Outcomes (COs) / (POs)	MDC5ZOO T1	MDC5ZOO T2	MDC5ZOO T3	MDC5ZOO T4	MDC5ZOO T5	MDC5ZOOT6
I Core competency	X					
II Critical thinking	X					
III Analytical reasoning	X					
IV Research skills	X					
V Team work	X					

Course Articulation Matrix relates course outcomes of course with the corresponding program outcomes whose attainment is attempted in this course. Mark 'X' in the intersection cell if a course outcome addresses a particular program outcome.

Course Content	Hrs
Unit I	14
<p>Chapter 1. Animal Architecture- Body symmetry- asymmetry, radial, biradial and bilateral symmetry with suitable example and Significance. Body organization- Protoplasmic, cellular, tissue and organ level of organization with suitable examples and Significance. Diploblasty (apparent and absolute) and Triploblasty with suitable Examples and Significance. Coelom- Acoelom, Pseudocoelom, and Eucoelom with suitable examples and Significance. Metamerism- Psuedometamerism (Strobilization), Eumetamerism with suitable examples and Significance. Cephalization- origin and significance.</p> <p>Chapter 2. General characters and classification of major Invertebrate phyla- Protozoa, Porifera, Coelenterata, Helminthes, Annelida, Arthropoda, Mollusca and Echinodermata up to the level of classes with suitable examples.</p>	

Unit II	14
<p>Chapter 3. Diversity of life sustaining systems in nonchordates: (with an example for each type of system) Locomotion: Protozoa- amoeboid (Sol-Gel theory), Flagellar, euglenoid and ciliary movements. Hydrostatic movements in Annelida-Earthworm and Echinodermata-starfish. Nutrition: In Protozoa. Feeding apparatus and mechanism: In Annelida-filter feeding, Arthropoda-Prawn, Mollusca-Pila and Echinodermata-Sea Star. Respiration: In Protozoa-diffusion, Helminthes-parasitic, Annelida-cutaneous, Arthropoda (any one type), Mollusca (Gill) and Echinodermata (Dermal papillae and Tube feet). Circulation: In Protozoa (cyclosis), Annelida- Earthworm, Arthropoda-Prawn, Mollusca-Pila and Echinodermata- Sea Star. Osmoregulation and excretion: In Protozoa-Contractile vacuoles, Platyhelminthes- Flame cells, Annelida-Nephredia and Arthropoda-Green glands.</p>	
Unit III	14
<p>Chapter 4. Diversity of coordinating systems and generative systems in nonchordates: (with an example for each type of system) Nervous system in Coelenterata, Platyhelminthes, Annelida, Arthropoda, Mollusca and Echinodermata. Neuroendocrine system and pheromones in Insecta. Sense organs: Mechanoreceptors, Photoreceptors, Chemoreceptors, thigmoreceptors, rheoreceptors and proprioceptors. Reproduction: Asexual and sexual reproduction in Protozoa, Porifera, Coelenterate, Annelida and Echinodermata. Metamorphosis in Insecta. Larval forms of Coelenterata, Annelida and Echinodermata.</p>	
Unit IV	14
<p>Chapter 5. Beneficial non-chordates: Non-chordates used as food; Arthropoda and Mollusca. Non-chordates in Industry and Industrial products; Silkworm-silk, Lac Insect-shellac, Honey bees-bee wax, Pearl Oysters- pearls, Corals, sponges, shells dyes and pigments. Non-chordates in medicinal use-Leeches, Maggot larva and honey. Non-chordates in agriculture-earthworms, pollinators and pest controllers. Non-chordates in food chain and as scavengers.</p>	07
<p>Chapter 6. Harmful non-chordates Parasitic Platyhelminthes. Soil Nematodes. Agricultural, veterinary and human pests of Arachnida. Agricultural, veterinary and human pests of Arthropoda.</p>	07

Topics Suggested for Assignment/ Formative Assessment:

Animal connecting links. 2. Polymorphism 3. Parasitic adaptations 4. Metamorphosis 5. Freshwater sponges 6. Molluscans of industrial value 7. Coral reefs and their role in ecosystem generation 8. Invertebrate minor phyla 9. Regeneration in sponges and *Planaria* 10. Soil and water protozoa

Recommended Books:

- Barnes, R. S. K.; Calow, P.; Olive, P. J. W.; Golding, D. W.; Spicer, J. I. (2002) The Invertebrates: a Synthesis, Blackwell Publishing.
- Hickman, C.; Roberts, L.S.; Keen, S.L.; Larson, A. and Eisenhour, D. (2018) Animal Diversity, McGraw-Hill.
- Holland, P. (2011) The Animal Kingdom: A Very Short Introduction, Oxford University Press.
- Barrington, E.J.W. (1979) Invertebrate Structure and Functions. II Edition. E.L.B.S. and Nelson.
- Boradale, L.A. and Potts, E.A. (1961) Invertebrates: A Manual for the use of Students. Asia Publishing Home.
- Bushbaum, R. (1964) Animals without Backbones. University of Chicago Press.

Web Sources:

Animal Diversity (<https://swayam.gov.in/courses/5686-animal-diversity>)

Advances in Animal Diversity, Systematics and Evolution

(<https://swayam.gov.in/courses/5300-zoology>)

ePGPathshala (MHRD)Module 10, 18, 19 of the paper P-08 (Biology of Parasitism)
<https://epgp.inflibnet.ac.in/ahl.php?csrno=35>

Pedagogy: Lectures, Presentations, videos, Assignments and Weekly Formative Assessment Tests.

Formative Assessment	
Assessment Occasion	Weightage in Marks
Assignment/ Field Report/ Project	15 Marks
Test	20 Marks
Participation in class	05 marks
Total	40 Marks

Date:

Co-Ordinator

Subject Committee Chairperson

Minor Course Lab Content

Semester: I

Course Title: Lab on BIOLOGY OF NON-CHORDATES	Course Credits: 02
Course Type: Minor Discipline Core Practical, L-T-P: 0-0-4	Course Code: MDC5ZOOP1
Total Contact Hours: 56	Duration of ESA: 03 Hours
Formative Assessment Marks: 15	Summative Assessment Marks: 35
Model Syllabus Authors:	

Course Outcomes (COs):

At the end of the course the student should be able to:

1. Understand basics of classification of non-chordates.
2. Learn the diversity of habit and habitat of these species.
3. Develop the skills to identify different classes and species of animals.
4. Know uniqueness of a particular animal and its importance
5. Enhancement of basic laboratory skill like keen observation and drawing.

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs)

Course Outcomes (COs) / Program Outcomes (POs)	MDC5ZOO P1	MDC5ZOOP 2	MDC5ZOOP 3	MDC5ZOOP 4	MDC5ZOOP 5	MDC5ZOOP 6
I Core competency	X					
II Critical thinking	X					
III Analytical reasoning	X					
IV Research skills	X					
V Team work	X					

Course Articulation Matrix relates course outcomes of course with the corresponding program outcomes whose attainment is attempted in this course. Mark 'X' in the intersection cell if a course outcome addresses a particular program outcome.

MDC Lab I Course Content

List of labs to be conducted	Hours
<ol style="list-style-type: none"> 1. Preparation and observation of protozoan culture. 2. Protozoa: Systematics of <i>Amoeba</i>, <i>Euglena</i>, <i>Noctiluca</i>, <i>Paramecium</i> and <i>Vorticella</i> (Permanent slides). 3. Porifera: Systematics of <i>Sycon</i>, <i>Euplectella</i>, <i>Hyalonema</i>, <i>Spongilla</i> and <i>Euspongia</i> (Specimens). Study of permanent slides of T.S of <i>Sycon</i>, spicules and gemmules. 4. Cnidaria: Systematics of <i>Aurelia</i> and <i>Metridium</i> (Specimens). Slides of <i>Hydra</i>, <i>Obelia</i>-polyp and medusa, and <i>Ephyra</i> larva, T.S. of <i>Metridium</i> passing through mesenteries. 5. Study of Corals-<i>Astraea</i>, <i>Fungia</i>, <i>Meandrina</i>, <i>Corallium</i>, <i>Gorgonia</i>, <i>Millepora</i> and <i>Pennatula</i>. 	56

6. **Helminthes:** Systematics of *Planaria*, *Fasciola hepatica* and *Taeniasolium*, Ascaris- Male and female (Specimens). Slides of T.S. of *Planaria*, T.S of male and female Ascaris,
7. **Annelida:** Systematics of *Nereis*, *Heteronereis*, *Sabella*, *Aphrodite* (Specimens). Slide of T.S. of Earth worm through typhlosole.
8. **Arthropoda:** Systematics of *Panaeus*, *Palaemon*, *Astracus*, Scorpion, Spider, *Limulus*, *Peripatus*, Millipede, Centipede, Praying mantis, Termite Queen, Moth, Butterfly, Dung beetle/Rhinoceros beetle (Any six specimens). Slide of Larvae- Nauplius, Zoea, Mysis.
9. **Mollusca:** Systematics of *Chiton*, *Mytilus*, *Aplysia*, *Pila*, *Octopus*, *Sepia*, Glochidium larva (Specimens).
10. **Shell Pattern-** *Unio*, *Ostrea*, *Cypria*, *Murex*, *Nautilus*, *Patella*, *Dentalium*, Cuttle bone.
11. **Echinodermata:** Systematics of Sea star, Brittle star, Sea Urchin, Sea cucumber, Sea lily (Specimens). Slide of Bipinnaria larva, Echinopluteus larva and Pedicellaria.
12. **Harmful Nonchordates:** Soil Nematodes. Agricultural, veterinary and human pests of Arachnida. Agricultural, veterinary and human pests of Arthropoda.
13. **Beneficial Nonchordates:**
14. **Sericulture:** Life cycle of *Bombyxmori*, Uzi fly, Cocoon, Raw silk.
15. **Apiculture:** Any 2 Species of honey bee, bee wax.
16. **Pearl Culture:** Pearl Oyster and Natural Pearls.
17. **Virtual Dissection/Cultured specimens:** Earthworm – Nervous system Leech- Digestive System
18. **Virtual Dissection/ Cultured specimens:** Prawn - Nervous system. Cockroach- Salivary Apparatus and Digestive system.

Recommended Books:

- Barnes, R. S. K.; Calow, P.; Olive, P. J. W.; Golding, D. W.; Spicer, J. I. (2002) The Invertebrates: a Synthesis, Blackwell Publishing.
- Hickman, C.; Roberts, L.S.; Keen, S.L.; Larson, A. and Eisenhour, D. (2018) Animal Diversity, McGraw-Hill.
- Holland, P. (2011) The Animal Kingdom: A Very Short Introduction, Oxford University Press.
- Barrington, E.J.W. (1979) Invertebrate Structure and Functions. II Edition. E.L.B.S. and Nelson.
- Boradale, L.A. and Potts, E.A. (1961) Invertebrates: A Manual for the use of Students. Asia Publishing Home.
- Bushbaum, R. (1964) Animals without Backbones. University of Chicago Press.

Web References:

Anatomy of earthworm: The dissection works (CD); www.scienceclass.com, www.neosci.com
Cockroach dissection- www.ento.vt.edu

Pedagogy: Lectures, Presentations, videos, Labs, Assignments, Tests, Individual or group Field oriented Project Report on, Visit to one research institute/ one wild life sanctuary / museum / zoo.

TOPICS RECOMMENDED FOR PROJECT/ MONOGRAPH PREPARATION

General account of protozoan ooze.
Monograph on sea anemones.
Monograph on polychaetes.
Monograph on leeches.

Formative Assessment	
Assessment Occasion	Weightage in Marks
Assignment/Monograph	05
Test	05
Participation in class	05
Total	15

Date:

Co-Ordinator

Subject Committee Chairperson

Open Elective Course Content

Semester: **I**

Course Title: Economic Zoology Course Code: OEC5ZOOT1	Course Credits: 3
Total Contact Hours: 42	Duration of ESA: 3 Hours
Formative Assessment Marks: 40	Summative Assessment Marks: 60
Model Syllabus Authors:	

Course Outcomes (COs):

At the end of the course the student will be able to:

1. Gain knowledge about silkworms rearing and their products.
2. Gain knowledge in Bee keeping equipment and apiary management.
3. Acquaint knowledge on dairy animal management, the breeds and diseases of cattle and learn the testing of egg and milk quality.
4. Acquaint knowledge about the culture techniques of fish and poultry.
5. Acquaint the knowledge about basic procedure and methodology of vermiculture.
6. Learn various concepts of lac cultivation.
7. Students can start their own business i.e. self-employments.
8. Get employment in different applied sectors

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs)

Course Outcomes (COs) / Program Outcomes (POs)	CC 1	CC 2	CC 3	CC 4	CC 5	CC 6	CC 7	CC 8	CC 9	CC 10	CC 11	CC 12
I Core competency	X											
II Critical thinking	X											
III Analytical reasoning	X											
IV Research skills	X											
V Team work	X											

Course Articulation Matrix relates course outcomes of course with the corresponding program outcomes whose attainment is attempted in this course. Mark 'X' in the intersection cell if a course outcome addresses a particular program outcome.

Course Content

Content	Hrs
Unit I	14
<p>Chapter 1. Sericulture:</p> <ul style="list-style-type: none"> • History and present status of sericulture in India • Mulberry and non-mulberry species in Karnataka and India • Mulberry cultivation • Morphology and life cycle of <i>Bombyxmori</i> • Silkworm rearing techniques: Processing of cocoon, reeling • Silkworm diseases and pest control <p>Chapter 2. Apiculture:</p> <ul style="list-style-type: none"> • Introduction and present status of apiculture • Species of honey bees in India, life cycle of <i>Apisindica</i> • Colony organization, division of labour and communication • Bee keeping as an agro based industry; methods and equipments: indigenous methods, extraction appliances, extraction of honey from the comb and processing • Bee pasturage, honey and bees wax and their uses • Pests and diseases of bees and their management 	
Unit II	14
<p>Chapter 3. Live Stock Management:</p> <ul style="list-style-type: none"> • Dairy: Introduction to common dairy animals and techniques of dairy management • Types, loose housing system and conventional barn system; advantages and limitations of dairy farming • Establishment of dairy farm and choosing suitable dairy animals-cattle • Cattle feeds, milk and milk products • Cattle diseases • Poultry: Types of breeds and their rearing methods • Feed formulations for chicks • Nutritive value of egg and meat • Disease of poultry and control measures <p>Chapter 4. Aquaculture:</p> <ul style="list-style-type: none"> • Aquaculture in India: An overview and present status and scope of aquaculture • Types of aquaculture: Pond culture: Construction, maintenance and management; carp culture, shrimp culture, shellfish culture, composite fish culture and pearl culture 	
Unit - 3	14
<p>Chapter 5. Fish culture:</p> <ul style="list-style-type: none"> • Common fishes used for culture. • Fishing crafts and gears. • Ornamental fish culture: Fresh water ornamental fishes- biology, breeding techniques • Construction and maintenance of aquarium: Construction of home aquarium, materials used, setting up of freshwater aquaria, aquarium plants, ornamental objects, cleaning the aquarium, maintenance of water quality. control of snail and algal growth. • Modern techniques of fish seed production <p>Chapter 6. Prawn culture:</p> <ul style="list-style-type: none"> • Culture of fresh and marine water prawns. • Preparation of farm. • Preservation and processing of prawn, export of prawn. <p>Chapter 7. Vermiculture:</p> <ul style="list-style-type: none"> • Scope of vermiculture. • Types of earthworms. • Habit categories - epigeic, endogeic and anecic; indigenous and exotic species. <p>Methodology of vermicomposting: containers for culturing, raw materials required, preparation of bed, environmental pre-requisites, feeding, harvesting and storage of vermicompost.</p> <ul style="list-style-type: none"> • Advantages of vermicomposting. • Diseases and pests of earthworms. 	

Chapter 8.Lac Culture:

- History of lac and its organization, lac production in India.
- Life cycle, host plants and strains of lac insect.
- Lac cultivation: Local practice, improved practice, propagation of lac insect, inoculation period, harvesting of lac.
- Lac composition, processing, products, uses and their pests.

Text Books**Suggested Readings:**

1. Eikichi, H. (1999). Silkworm Breeding (Translated from Japanese). Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
2. Ganga, G. (2003). Comprehensive Sericulture Vol-II: Silkworm Rearing and Silk Reeling. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
3. Mahadevappa, D., Halliyal, V.G., Shankar, D.G. and Bhandiwad, R., (2000). Mulberry Silk Reeling Technology Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
4. Roger, M (1990). The ABC and Xyz of Bee Culture: An Encyclopedia of Beekeeping, Kindle Edition.
5. Shukla and Upadhyaya (2002). Economic Zoology, Rastogi Publishers
6. YadavManju (2003). Economic Zoology, Discovery Publishing House.
7. JabdePradip V (2005). Textbook of applied Zoology, Discovery Publishing House, New Delhi.
8. Cherian & Ramachandran Bee keeping in-South Indian Govt. Press, Madras.
9. Sathe, T.V. Vermiculture and Organic farming.
10. Bard. J (1986). Handbook of Tropical Aquaculture.
11. Santhanam, R. A. Manual of Aquaculture.
12. Zuka. R.1 and Hamiyn (1971). Aquarium fishes and plants
13. Jabde, P.V. (2005) Text Book of Applied Zoology: Vermiculture, Apiculture, Sericulture, Lac culture.
14. Animal Disease- Bairagi K. N. Anmol Publications Pvt.Ltd 2014
15. Economics Of Aquaculture - Singh(R.K.P) - Danika Publishing Company 2003
16. Applied and Economic Zoology (SWAYAM) web https://swayam.gov.in/nd2_cec20_ge23/preview

Course Books published in English and Kannada may be prescribed by the Universities and College

References

Pedagogy: Chalk and Talk, PPT, Group discussion, Seminar, Field visit

Formative Assessment	
Assessment Occasion	Weightage in Marks
House Examination/Test	20
Written Assignment/Presentation/Project / Term Papers/Seminar	15
Class performance/Participation	05
Total	40

Date: Course Co-Ordinator

Subject Committee Chairperson

Skill Enhancement Course in Zoology

Course Content

Semester: I

Course Title: Vermiculture Course Code: VEC5ZOOP1	Course Credits: 2
Total Contact Hours: 56 Hours	Duration of ESA: 3 Hrs
Formative Assessment Marks: 15	Summative Assessment Marks: 35
Model Syllabus Authors:	

Course Outcomes (COs):

At the end of the course the student:

1. Understands the importance of earthworms in maintaining soil quality.
2. Learns that the vermicomposting is an effective organic solid waste management method.
3. Gets acquainted with the importance of earthworms in agro-based economic activity.
4. Vermicomposting leads to organic farming and healthy food production.
5. Vermicomposting may be taken up as a small scale industry by the farmers and unemployed youth.
6. Get jobs in teaching institutions or vermiculture units as technicians.
7. Learn the concept of vermicomposting as bio fertilizers thus student can become an entrepreneur after completion of the course.
8. Best opportunity for self-employment and lifelong learning with farmers.

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs)

Course Outcomes (COs) / Program Outcomes (POs)	VEC5ZOO P1	2	3	4	5	6	7	8	9	10	11	12
i Core competency.	X											
ii Critical thinking.	X											
iii Analytical reasoning.	X											
iv Research skill.	X											
v Team work.	X											

Course Articulation Matrix relates course outcomes of course with the corresponding program outcomes whose attainment is attempted in this course. Mark '_X_' in the intersection cell if a course outcome addresses a particular program outcome.

Course Content

List of labs to be conducted		56Hrs
1	Collection of native earth worm species to study habit and habitat.	
2	Keys to identify different species of earth worm.	
3	Externals and Life cycle of <i>Eiseniafetida</i> and <i>Eudriluseugeniae</i> .	
4	Dissection of digestive and reproductive system.	
5	Study of vermicomposting equipments and devices.	
6	Preparation of vermibeds and their maintenance.	
7	Study of different vermicomposting methods.	
8	Harvesting, separation of worms, packaging, transport and storage of vermicompost.	
9	Vermi-wash collection and processing.	
10	Small scale earth worm farming for home gardens and studying the effect of vermicompost on garden plants.	
11	Budget and cost scenario of vermiculture (Project).	
12	Diseases and natural enemies of earth worms and their control measures.	
13	Role of vermitechnology in environmental protection.	
14	Economics and Marketing of vermicompost and vermi wash.	
15	Visit to vermiculture farm to acquaint with latest techniques.	

Text Books and references

- 1) Bhatt J.V. & S.R. Khambata (1959) -Role of Earthworms in Agriculture| Indian Council of Agricultural Research, New Delhi
- 2) Edwards, C.A. and J.R. Lofty (1977) -Biology of Earthworms| Chapman and Hall Ltd., London.
- 3) Lee, K.E. (1985) -Earthworms: Their ecology and Relationship with Soils and Land Use Academic Press, Sydney.
- 4) Dash, M.C., B.K.Senapati, P.C. Mishra (1980) — Verms and Vermicomposting| Proceedings of the National Seminar on Organic Waste Utilization and Vermicomposting Dec. 5-8, 1984, (Part B), School of Life Sciences, Sambalpur University, JyotiVihar, Orissa.
- 5) Kevin, A and K.E.Lee (1989) — Earthworm for Gardeners and Fisherman (CSIRO,Australia, Division of Soils)
- 6) Satchel, J.E. (1983) -Earthworm Ecology| Chapman Hall, London.
- 7) Wallwork, J.A. (1983) -Earthworm Biology| Edward Arnold (Publishers) Ltd. London.

Pedagogy

1. Demonstration
2. Assignment
3. Group discussion
4. Field visit
5. Use of Audio-Visual aids.

Formative Assessment	
Assessment Occasion	Weightage in Marks
Class Test	05
Attendance and Assignments	05
Visit to vermicompost unit and report	05
Total	15

Date:**Course Coordinator****Subject Committee Chairperson**

Proposed Course content under New Education Policy – Year 2021-22
For II Semester B.Sc Zoology
Core Course Content

Course Title: Biochemistry and Physiology	Course Credits: 4
Course Code: DSCC5Z00T2	L-T-P per week: 4-0-0
Total Contact Hours: 56	Duration of ESA: 3 Hours
Formative Assessment Marks: 40	Summative Assessment Marks: 60
Model Syllabus Authors:	

Course outcomes:

The student at the completion of the course will learn:

1. To develop a deep understanding of structure of biomolecules like proteins, lipids and carbohydrates.
2. How simple molecules together form complex macromolecules.
3. To understand the thermodynamics of enzyme catalyzed reactions.
4. Mechanisms of energy production at cellular and molecular levels.
5. To understand various functional components of an organism.
6. To explore the complex network of these functional components.
7. To comprehend the regulatory mechanisms for maintenance of function in the body.

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs)

Course Outcomes (COs) / Program Outcomes (POs)	CC 1	CC T2	CC 3	CC 4	CC 5	CC 6	CC 7	CC 8	CC 9	CC 10	CC 11
I Core competency		X									
II Critical thinking		X									
III Analytical reasoning		X									
IV Research skills		X									
V Team work		X									

Note: Course Articulation Matrix relates course outcomes of course with the corresponding program outcomes whose attainment is attempted in this course. Mark 'X' in the intersection cell if a course outcome addresses a particular program outcome.

Core Course content:

Content	Hours
Unit I	14
<p>Chapter 1. Structure and Function of Biomolecules:</p> <ul style="list-style-type: none"> • Structure and Biological importance of carbohydrates (Monosaccharides, Disaccharides, Polysaccharides and Glycoconjugates). • Lipids (saturated and unsaturated Fatty acids, Tri-acylglycerols, Phospho lipids, Glycolipids and Steroids) • Structure, Classification and General Properties of α-amino acids; Essential and non-essential amino acids, Levels of organization in proteins; Simple and conjugate proteins. 	
<p>Chapter 2. Enzyme Action and Regulation</p> <ul style="list-style-type: none"> • Nomenclature and classification of enzymes; Cofactors; Specificity of enzyme action. • Isozymes; Mechanism of enzyme action • Enzyme kinetics; Factors affecting rate of enzyme-catalyzed reactions ; Equation of Michaela's -Mendon, Concept of K_m and V_{max}, Enzyme inhibition • Allosteric enzymes and their kinetics; Regulation of enzyme action. 	
Unit 2	14
<p>Chapter 3. Metabolism of Carbohydrates and Lipids</p> <ul style="list-style-type: none"> • Metabolism of Carbohydrates: glycolysis, citricacid cycle, gluconeogenesis, phosphate pentose pathway Glycogenolysis and Glycogenesis Lipids- Biosynthesis of palmiticacid; Ketogenesis, • β-oxidation and omega -oxidation of saturated fatty acids with even and odd number of carbonatoms <p>Chapter 4. Metabolism of Proteins and Nucleotides</p> <ul style="list-style-type: none"> • Catabolism of amino acids: Transamination, Deamination, Ureacycle, Nucleotides and vitamins • Peptide linkages 	
Unit 3	14
<p>Chapter 5. Digestion and Respiration in humans</p> <ul style="list-style-type: none"> • Structural organization and functions of gastrointestinal tract and associated glands. • Mechanical and chemical digestion of food; Absorptions of carbohydrates, lipids, proteins, water, minerals and vitamins; Physiology of trachea and Lung. • Mechanism of respiration, Pulmonary ventilation; Respiratory volumes and capacities; Transport of oxygen and carbon dioxide in blood, Respiratory pigments, Dissociation curves and the factors influencing it; • Control of respiration. 	

<p>Chapter 6. Circulation and Excretion in humans</p> <ul style="list-style-type: none"> • Components of blood and their functions; hemopoiesis • Blood clotting: Blood clotting system, Blood groups: Rh-factor, ABO and MN • Structure of mammalian heart • Cardiac cycle; Cardiac output and its regulation, Electrocardiogram, Blood pressure and its regulation • Structure of kidney and its functional unit; Mechanism of urine formation 	
Unit 4	14
<p>Chapter 7. Nervous System and Endocrinology in humans</p> <ul style="list-style-type: none"> • Structure of neuron, resting membrane potential(RMP) • Origin of action potential and its propagation across the myelinated and unmyelinated nerve fibers. Types of synapse • Endocrine glands - pineal, pituitary, thyroid, parathyroid, pancreas and adrenal; hormones secreted by them. • Classification of hormones; Mechanism of Hormone action. 	
<p>Chapter 8. Muscular System in humans</p> <ul style="list-style-type: none"> • Histology of different types of muscle; Ultra structure of skeletal muscle; Molecular and chemical basis of muscle contraction; Characteristics of muscle twitch; Motor unit, summation and tetanus 	

Pedagogy: Written Assignment/Presentation/Project / Term Papers/Seminar

Formative Assessment	
Assessment Occasion	Weightage in Marks
House Examination/Test	20
Written Assignment/Presentation/Project / Term Papers/Seminar	15
Class performance/Participation	05
Total	40

Date: Co-ordinator

Subject Committee Chairperson

Zoology Semester II Core Course Lab Content

Course Title/Code: Biochemistry and Physiology	Course Credits: 2
Course Code: DSCC5Z00P2	L-T-P per week: 0-0-4
Total Contact Hours: 56	Duration of ESA: 3 Hours
Formative Assessment Marks: 15	Summative Assessment Marks: 35
Model Syllabus Authors:	

Course Outcomes (COs):

At the end of the course the student should be able to understand:
 Basic structure of biomolecules through model making.
 Develop the skills to identify different types of blood cells.
 Enhance basic laboratory skill like keen observation, analysis and discussion.
 Learn the functional attributes of biomolecules in animal body.
 Know uniqueness of enzymes in animal body and their importance through enzyme kinetics.

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs)

Course Outcomes (COs) / Program Outcomes (POs)	CC P1	CC P2	CC 3	CC 4	CC 5	CC 6	CC 7	CC 8	CC 9	CC 10	CC 11
I Core competency		X									
II Critical thinking		X									
III Analytical reasoning		X									
IV Research skills		X									
V Team work		X									

Note: Course Articulation Matrix relates course outcomes of course with the corresponding program outcomes whose attainment is attempted in this course. Mark ‘X’ in the intersection cell if a course outcome addresses a particular program outcome.

Course Content

List of labs to be conducted	Hours
1. Preparation of models of nitrogenous bases- nucleosides and nucleotides. 2. Preparation of models of amino acids and dipeptides. 3. Preparation of models of DNA and RNA. 4. Qualitative analysis of Carbohydrates, Proteins and Lipids. 5. Qualitative analysis of Nitrogenous wastes – Ammonia, Urea and Uric acid. 6. Separation of amino acids or proteins by paper chromatography.	20
7. Determination of the activity of enzyme (Urease)-Effect of [S] and determination of Km and Vmax. 8. Determination of the activity of enzyme (Urease) - Effect of temperature and time. 9. Action of salivary amylase under optimum conditions. 10. Quantitative estimation of Oxygen consumption by fresh water Crab. 11. Quantitative estimation of salt gain and salt loss by fresh water.	15
12. Estimation of Hemoglobin in human blood using Sahli’s haemoglobinometer. 13. Counting of RBC in blood using Hemocytometer. 14. Counting of WBC in blood using Hemocytometer. 15. Differential staining of human blood corpuscles using Leishman stain. 16. Recording of blood glucose level by using glucometer.	15

Virtual Labs (Suggestive sites)

06

<https://www.vlab.co.in>
<https://zoologysan.blogspot.com> www.vlab.iitb.ac.in/vlab
www.onlinelabs.in www.powershow.com
<https://vlab.amrita.edu>
<https://sites.dartmouth.edu>

Text Books

1. Nelson & Cox: Leininger's Principles of Biochemistry: McMillan (2000)
2. Zubay et al: Principles of Biochemistry: WCB (1995)
3. Voet & Voet: Biochemistry Vols 1 & 2: Wiley (2004)
4. Murray et al: Harper's Illustrated Biochemistry: McGraw Hill (2003) Elliott and Elliott: Biochemistry and Molecular Biology: Oxford University Press
5. Guyton, A.C. & Hall, J.E. Textbook of Medical Physiology, XI Edition, Harcourt Asia PTE Ltd. /W.B.Saunders Company. (2006).
6. Tortora, G.J. & Grabowski, S. Principles of Anatomy & Physiology. XI Edition John Wiley & sons (2006).
7. Christopher D. Moyes, Patricia M. Schulte. Principles of Animal Physiology. 3rd Edition, Pearson Education (2016).
8. Hill, Richard W., et al. Animal physiology. Vol. 2. Sunderland, MA: Sinauer Associates, (2004).
9. Chatterjee CC Human Physiology Volume 1 & 2, 11th edition, CBS Publishers (2016).

Web References:

- Mammalian Physiology – www.biopac.com

Pedagogy: Lectures, Presentations, videos, Virtual Labs, Assignments, Tests, Individual or group Field oriented Project Report on or visit to a research institute.

TOPICS RECOMMENDED FOR SEMINAR/PROJECT REPORT

1. Biochemical pathways, their evolutionary background and regulation.
2. Blood groups and their importance.
3. Vital enzymes for human body.
4. Essential and nonessential amino acids.
5. Important body lipids.
6. Significance of animal proteins.
7. Role of carbohydrates in animal body.
8. Nature of proteins and nurture of animal body.
9. Role of lipids in structural and functional organization of body.

Formative Assessment	
Assessment Occasion	Weightage in Marks
Assignment/Monograph	05
Test	05
Participation in class	05
Total	15

Date: Co-ordinator

Subject Committee Chairperson

Course Content

Semester: **II Semester B. Sc., (Hons) Zoology**

Minor Core course

Course Title: PAPER I-BIOLOGY OF CHORDATES	Course Code: MDC5ZOOT2
Course Type: Minor Discipline Core Theory, L-T-P: 4-0-0	Course Credits: 4
Total Contact Hours: 56	Duration of ESA: 3 Hrs
Formative Assessment Marks: 40	Summative Assessment Marks: 60
Model Syllabus Authors:	

Course Outcomes (COs):

At the end of the course the student should be able to:

1. Learn the structural biology of Chordates through their adaptive features.
2. Study the functional biology of Chordates through their body organization and functions.
3. Comprehend the identification of species and their evolutionary relationships.
4. Enhancement of research skills like critical thinking.
5. Develop abilities required for industrial employment as well as self-employment.

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs)

Course Outcomes (COs) / (POs)	MDC5ZO O T1	MDC5ZOO T2	MDC5ZOO T3	MDC5ZOO T4	MDC5ZOO T5	MDC5ZOO T6
I Core competency		X				
II Critical thinking		X				
III Analytical reasoning		X				
IV Research skills		X				
V Team work		X				

Course Articulation Matrix relates course outcomes of course with the corresponding program outcomes whose attainment is attempted in this course. Mark 'X' in the intersection cell if a course outcome addresses a particular program outcome.

Course Content	Hrs
Unit I	14
<p>Chapter 1: Hemichordata: Type Study of <i>Balanoglossus</i> – Habit and Habitat, Morphology, Coelom. Tornaria larva and its affinities. Affinities and systematic position of Hemichordata.</p> <p>Chapter 1: Chordates: Origin of Chordates. Basic characters of chordates and classification upto classes.</p> <p>Chapter 3: Urochordata : Type Study of <i>Herdmania</i>-Habit and Habitat, Morphology, Ascidian tadpole- structure and its retrogressive metamorphosis.</p> <p>Chapter 4: Cephalochordata : Type Study of <i>Branchiostoma (Amphioxus)</i>-Habit and Habitat, Morphology, Digestive system, Feeding mechanism and circulatory system.</p> <p>Chapter 5: Agnatha General characters of Agnatha and classification upto classes. Salient features of Cyclostomata and Ostracodermi with orders and examples. Ammocoete larva and its significance.</p>	

Unit II	14
<p>Chapter 6: Vertebrates: General characters and Classification of different classes of vertebrates (Pisces, Amphibia, Reptilia, Aves, Mammalia) up to the order with examples. General characters of Chondrichthyes and Osteichthyes. Interesting features and evolutionary significance of Dipnoi. Salient features of Placodermi with examples. Interesting features of Sphenodon. Interesting features of Archaeopteryx. Salient features of Ratitae and Carinatae with examples. Interesting features of mammalian orders (Insectivora, Carnivora, Chiroptera, Cetacea, Proboscidea, Ungulata – Perissodactyla and Artiodactyla, and Primates –Platyrrhini and Catarrhini) with examples.</p>	
Unit III	14
<p>Chapter 7: General account of Chordates: Types of caudal fins and tails in fishes. Osmoregulation and Swim bladder in Fishes. Origin of Amphibia. Neoteny and Paedogenesis. Adaptive radiation in extinct reptiles with suitable examples. Temporal fossae in reptiles. Poison apparatus and biting mechanism in snakes. Parental care in Pisces, Amphibians, Reptiles, Birds and Mammals. Dentition in mammals. Evolution of molar tooth. Migration in Pisces, and Birds and Mammals.</p> <p>Chapter 8: Type study of <i>Rattus</i>: Morphology, Endoskeleton (Axial and appendicular skeleton, except hands and feet) Digestive system, circulatory system, reproductive system.</p>	
Unit IV	14
<p>Beneficial Chordates:</p> <p>Chapter 9: Pisciculture Meaning of Aquaculture and Pisciculture, inland and marine fisheries. Inland Pisciculture – Procedure, composite fish forming and significance. A brief account of fishing gears and crafts. Fish processing and preservation.</p> <p>Chapter 10: Poultry Definition, breeds of Fowls. Indigenous and exotic breeds with suitable examples. Poultry products and by-products. Diseases of poultry – Ranikhet, Fowl pox, Fowl Cholera, Fowl Typhoid.</p> <p>Chapter 11: Dairy Breeds of cattle: indigenous and exotic breeds. Improvements in cattle breeding – artificial insemination, MOET. Pasteurization and gobar gas. Diseases in cattle- Foot and Mouth diseases, causes and effects.</p>	

Topics Suggested for Assignment/ Formative Assessment:

1. Animal connecting links.
2. Migration in Birds
3. Communication in Primates
4. Parental Care in Animals
5. Neoteny
6. Paedogenesis
7. Poultry management
8. Dairy Management
9. Fisheries management
10. Products and by-products of Dairy.

Suggested Readings:

1. Harvey et al: The Vertebrate Life (2006)
2. Colbert et al: Colbert's Evolution of the Vertebrates: A History of the Backboned Animals through Time (5th ed 2002, Wiley-Liss)
3. Hildebrand: Analysis of Vertebrate Structure (4th ed 1995, John Wiley)
4. Kenneth V. Kardong (2015) Vertebrates: Comparative Anatomy, Function, Evolution McGraw Hill
5. McFarland et al: Vertebrate Life (1979, Macmillan Publishing)
6. Parker and Haswell: Text Book of Zoology, Vol. II (1978, ELBS)
7. Romer and Parsons: The Vertebrate Body (6th ed 1986, CBS Publishing Japan)
8. Young: The Life of Vertebrates (3rd ed 2006, ELBS/Oxford)
9. Weichert C. K. and William Presch (1970). Elements of Chordate Anatomy, Tata McGraw Hills

Web Sources:

1. <https://www.khanacademy.org/science/biology/crash-course-bio-ecology/crash-course-biology-science/v/crash-course-biology-123>
2. <https://opentextbc.ca/biology2openstax/chapter/chordates/>

Pedagogy: Lectures, Presentations, videos, Assignments and Weekly Formative Assessment Tests.

Formative Assessment	
Assessment Occasion	Weightage in Marks
Assignment/ Field Report/ Project	15 Marks
Test	20 Marks
Participation in class	05 marks
Total	40 Marks

Date: Co-Ordinator

Subject Committee Chairperson

Minor Core Course Lab Content

Semester: II Zoology

Course Title: Lab on Biology of Chordates, L-T-P: 0- 0-4	Course Credits: 2
Total Contact Hours: 56	Duration of ESA: 3 Hours
Formative Assessment Marks: 15	Summative Assessment Marks: 35
Model Syllabus Authors:	

Course Outcomes (COs):

At the end of the course the student should be able to:

1. Understand basics of classification of Chordates.
2. Learn the diversity of habit and habitat of animal species.
3. Develop the skills to identify different classes and orders of Chordates.
4. Know uniqueness of particular animal and its importance
5. Enhancement of basic laboratory skill like keen observation and drawing.

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs)

Course Outcomes (COs) / Program Outcomes (POs)	MDC5ZOO P1	MDC5ZOOP 2	MDC5ZOOP 3	MDC5ZOOP 4	MDC5ZOOP 5	MDC5ZOOP 6
I Core competency		X				
II Critical thinking		X				
III Analytical reasoning		X				
IV Research skills		X				
V Team work		X				

Note: Course Articulation Matrix relates course outcomes of course with the corresponding program outcomes whose attainment is attempted in this course. Mark 'X' in the intersection cell if a course outcome addresses a particular program outcome.

Minor Course Lab Content

List of labs to be conducted	56 Hours
<p>1. Protochordata: Balanoglossus and its T. S through proboscis Ascidian/ <i>Herdmania</i> and <i>Amphioxus</i>, T.S. of <i>Amphioxus</i> through pharynx and intestine.</p> <p>2. Cyclostomata: -<i>Petromyzon</i>, Ammocoete larva and <i>Myxine</i>.</p> <p>3. Pisces: - Cartilaginous Fishes – <i>Narcine</i>, <i>Trygon</i>, <i>Pristis</i>, <i>Myolobatis</i> - Bony Fishes – Zebra fish, Hippocampus, Muraena, Ostracion, Tetradon, Pleuronectus, Diodon, Echeneis.</p> <p>4. Ornamental fishes: -Siamese, Koi, Oscar, Betta Sp., Neon tetra, Guppies, Gold fish, Angle fish, Rainbow fish, Mollies.</p> <p>5. Accessory respiratory organs – Saccobranchus, Clarias and Anabas.</p> <p>6. Amphibia: -Frog, Bufo, Ambystoma, Axolotl larva, Necturus and Ichthyophis.</p> <p>7. Reptilia: -Turtle, Tortoise, Mabuya, Calotes, Chameleon, Varanus. snakes – Dryophis, Rat snake, Brahmini, Cobra, Krait, Russell’s viper and Hydrophis; Poison apparatus.</p> <p>8. Aves: Beak and feet modifications in the following examples: Duck, Crow, Sparrow, Humming bird, Parrot, King fisher, Eagle or Hawk.</p> <p>9. Mammalia: -Mongoose, Squirrel, Pangolin, Hedge Hog, Rabbit, Rat, Monkey and Loris.</p> <p>10. Virtual Dissection/Cultured specimens: -Shark/Bony fish: Afferent and efferent branchial systems, glossopharyngeal and vagus nerves.</p> <p>11. Virtual Dissection/Cultured specimens: - Frog: Origin and distribution of trigeminal nerve.</p> <p>12. Virtual Dissection/Cultured specimens: -Rat: Dissection (only demonstration) – Circulatory system (arterial and venous), urinogenital system.</p> <p>Beneficial Chordates:</p> <p>13. Pisciculture: Cultured varieties of fishes- fresh water and marine water fishes (locally available) Diseases- (Bacterial, viral, fungal and parasitic) Products and by products- (Meat, gelatin, Insulin, Isinglass, protein and chitin)</p>	

14. Poultry: Cultured varieties- Indigenous and exotic species.
Diseases- Bacterial and viral.
Products and by-products –Meat, Eggs, albumin flakes and manure.

15. Dairy: Cultured varieties-Indigenous and exotic breeds.
Diseases- Infectious, hereditary and deficiency.
Products and by-products – Milk, Cheese, Yougurt.

Suggested Readings:

1. Harveyetal : The Vertebrate Life(2006)
2. Colbertetal:Colbert’sEvolutionoftheVertebrates:Ahistoryofthebackbonedanimalsthroughtime (5thed2002, Wiley-Liss)
3. Hildebrand: Analysis of Vertebrate Structure(4thed1995,JohnWiley)
4. KennethV.Kardong(2015)Vertebrates:ComparativeAnatomy,Function,EvolutionMcGrawHill
5. McFarlandetal : Vertebrate Life(1979,MacmillanPublishing)
6. Parkerand Haswell: Text Book of Zoology, Vol. II(1978,ELBS)
7. Romerand Parsons: The Vertebrate Body(6thed 1986,CBSPublishingJapan)
8. Young: The Life of vertebrates(3rded2006,ELBS/Oxford)
9. WeichertC.KandWilliamPresch(1970).ElementsofChordateAnatomy,TataMcGrawHills

Web Sources:

1. <https://www.khanacademy.org/science/biology/crash-course-bio-ecology/crashncourse-biology-science/v/crash-course-biology-123>
2. <https://opentextbc.ca/biology2eopenstax/chapter/chordates/>

Pedagogy: Lectures, Presentations, videos, Assignments and Weekly Formative Assessment Tests.

Formative Assessment	
Assessment Occasion	Weightage in Marks
Assignment/Monograph	05
Test	05
Participation in class	05
Total	15

Date:Co-Ordinator

Subject Committee Chairperson

Open Elective Course Content

Semester: II Zoology

Course Title: Parasitology	Course Credits: 3
Course Code: OEC5ZOOT2	
Total Contact Hours: 42	Duration of ESA: 3 Hours
Formative Assessment Marks: 40	Summative Assessment Marks: 60
Model Syllabus Authors:	

Course Outcomes (COs):

At the end of the course the students will be able to:

9. Know the stages of the life cycles of the parasites and infective stages.
10. Develop ecological model to know population dynamics of parasite, establishment of parasite population in host body, adaptive radiations and methods adopted by parasite to combat with the host immune system.
11. Develop skills and realize significance of diagnosis of parasitic infection and treatment.
12. Understand about diseases caused by Protozoa, Helminthes, Nematodes and Arthropods at molecular level.
13. Develop their future career in medical sciences and related administrative services.

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs)

Course Outcomes (COs) / Program Outcomes (POs)	CC 1	CC 2	CC 3	CC 4	CC 5	CC 6	CC 7	CC 8	CC 9	CC 10	CC 11	CC 12
I Core competency	X											
II Critical thinking	X											
III Analytical reasoning	X											
IV Research skills	X											
V Team work												

Course Articulation Matrix relates course outcomes of course with the corresponding program outcomes whose attainment is attempted in this course. Mark '_X_' in the intersection cell if a course outcome addresses a particular program outcome.

Course Content

Content	42Hrs
Unit – 1	
<p>Chapter 1. General Concepts</p> <ul style="list-style-type: none"> • Introduction, Parasites, parasitoids, host, zoonosis • Origin and evolution of parasites • Basic concept of Parasitism, symbiosis, phoresis, commensalisms and mutualism • Host-parasite interactions and adaptations • Life cycle of human parasites • Occurance, mode of infection and prophylaxis <p>Chapter 2. Parasitic Platyhelminthes</p> <ul style="list-style-type: none"> • Study of morphology, life cycle, pathogenicity, prophylaxis and control measures of • <i>Fasciolopsisbuski</i> • <i>Schistosomahaematobium</i> • <i>Taeniasolium</i> • <i>Hymenolepis nana</i> <p>Chapter 3. Parasitic Protists</p> <ul style="list-style-type: none"> • Study of morphology, life cycle, pathogenicity, prophylaxis and control <i>measures</i> of • <i>Entamoebahistolytica</i> • <i>Giardia intestinalis</i> • <i>Trypanosomagambiense</i> • <i>Plasmodium vivax</i> 	14

Unit – 2	14
<p>Chapter 4. Parasitic Nematodes</p> <ul style="list-style-type: none"> • Study of morphology, life cycle, pathogenicity, prophylaxis and control measures of <ul style="list-style-type: none"> • <i>Ascarislumbricoides</i> • <i>Ancylostomaduodenale</i> • <i>Wuchereriabancrofti</i> • <i>Trichinellaspiralis</i> • Nematode plant interaction ; Gall formation <p>Chapter 5. Parasitic Arthropods</p> <ul style="list-style-type: none"> • Biology, importance and control of <ul style="list-style-type: none"> • Ticks (Soft tick <i>Ornithodoros</i>, Hard tick <i>Ixodes</i>) • Mites(<i>Sarcoptes</i>) • Lice (<i>Pediculus</i>) • Flea (<i>Xenopsylla</i>) • Bug (<i>Cimex</i>) • Parasitoid (Beetles) <p>Chapter 6. Parasitic Vertebrates</p> <ul style="list-style-type: none"> • Cookicutter Shark • Hood Mocking bird and Vampire bat and their parasitic behavior and effect on host 	
Unit – 3	14
<p>Chapter 7.Molecular diagnosis & clinical parasitology</p> <ul style="list-style-type: none"> • General concept of molecular diagnosis for parasitic infection • Advantages and disadvantages of molecular diagnosis • Fundamental techniques used in molecular diagnosis of endoparasites • Immunoassay or serological techniques for laboratory diagnosis of endoparasites on the basis of marker molecules like G.intestinalis, B. coli, E. histolytica, L. donovani, Malarial parasite using <ul style="list-style-type: none"> • ELISA, RIA • Counter Current Immunoelectrophoresis (CCI) • Complement Fixation Test (CFT) PCR, DNA, RNA probe 	

Suggested Readings:

19. Arora, D. R and Arora, B. (2001) Medical Parasitology. II Edition. CBS Publications and Distributors.
20. E.R. Noble and G.A. Noble (1982) Parasitology: The biology of animal parasites. V Edition, Lea &Febiger.
21. Ahmed, N., Dawson, M., Smith, C. and Wood, Ed. (2007) Biology of Disease. Taylor and Francis Group.
22. Parija, S. C. Textbook of medical parasitology, protozoology & helminthology (Text and colour Atlas), II Edition, All India Publishers & Distributers, Medical Books Publishers, Chennai, Delhi.
23. Meyer, Olsen & Schmidt's Essentials of Parasitology, Murray, D. Dailey, W.C. Brown Publishers.
24. K. D. Chatterjee (2009). Parasitology: Protozoology and Helminthology. XIII Edition, CBS Publishers & Distributors (P) Ltd.
25. Gunn, A. and Pitt, S.J. (2012). Parasitology: an Integrated Approach. Wiley Blackwell.
26. Noble, E. R. and G.A.Noble (1982) Parasitology: The biology of animal parasites. V th Edition, Lea &Febiger.
27. Paniker, C.K.J., Ghosh, S. [Ed} (2013). Paniker's Text Book of Medical Parasitology. Jaypee, New Delhi.
28. Parija,S.C.Textbookofmedicalparasitology,protozoology&helminthology(Textand color Atlas),II Edition, All India Publishers & Distributers, Medical Books Publishers, Chennai, Delhi.
29. Roberts, L.S and Janovy, J. (2009). Smith & Robert's Foundation of Parasitology. 8th. Edn. McGraw Hill.

30. Bogitsh, B. J. and Cheng, T. C. (2000). Human Parasitology. 2nd Ed. Academic Press, New York.
31. Chandler, A. C. and Read. C. P. (1961). Introduction to Parasitology, 10th ed. John Wiley and Sons Inc.
32. Cheng, T. C. (1986). General Parasitology. 2nd ed. Academic Press, Inc. Orlando.U.S.A.
33. Schmidt, G. D. and Roberts, L. S. (2001). Foundation of Parasitology. 3rd ed. McGraw Hill Publishers.
34. Schmidt, G. D. (1989). Essentials of Parasitology. Wm. C. Brown Publishers (Indian print 1990, Universal Book Stall).
35. John Hyde (1996) Molecular Parasitology Open University Press.
36. J Joseph Marr and Miklos Muller (1995) Biochemistry and Molecular Biology of Parasites 2nd Edn Academic Press.

Course Books published in English and Kannada may be prescribed by the Universities and College

Pedagogy: Chalk and Talk, PPT, Group discussion, Seminar, Interaction, virtual lab, Lab visit

Formative Assessment	
Assessment Occasion	Weightage in Marks
House Examination/Test	20
Written Assignment/Presentation/Project / Term Papers/Seminar	15
Class performance/Participation	05
Total	40

Date: _____ **Course Co-Ordinator** _____ **Subject Committee Chairperson** _____

Skill Enhancement Course Content

Semester: II Zoology

Course Title: Sericulture Course Code: VEC5ZOOP2	Course Credits: 2
Total Contact Hours: 56 Hours	Duration of ESA: 3 Hrs.
Formative Assessment Marks: 15	Summative Assessment Marks: 35
Model Syllabus Authors:	

Course Outcomes (COs):

At the end of the course the student acquires the following knowledge:

1. Sericulture is an agro-based industry which gives economic empowerment to the students.
2. Sericulture may be taken up as a small scale industry by the small farmers and unemployed youth.
3. Get jobs in teaching profession, silk board and other Govt. institutions as technicians.
4. Student can be self-employed after successful completion of the course.

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs)

Course Outcomes (COs) / Program Outcomes (POs)	VEC5ZOO P1	VEC5ZOO P2	3	4	5	6	7	8	9	10	11	12
i Core competency.		X										
ii Critical thinking.		X										
iii Analytical reasoning.		X										
iv Research skill.		X										
v Team work.		X										

Course Articulation Matrix relates course outcomes of course with the corresponding program outcomes whose attainment is attempted in this course. Mark ‘X’ in the intersection cell if a course outcome addresses a particular program outcome.

Course Content

List of Lab to be conducted		42 Hrs
1	Morphology and taxonomy of mulberry.	
2	Raising of saplings – cutting preparation, planting and maintenance of nursery.	
3	Agronomical practices in mulberry cultivation-weeding, manuring, irrigation and harvesting.	
4	Diseases and pests of mulberry.	
5	Silk producing insects – non mulberry and mulberry silk worms.	
6	Life cycle and morphology of <i>Bombyxmori</i> .	
7	Dissection of digestive system and silk glands of <i>Bombyxmori</i> .	
8	Silk worm rearing equipments.	
9	Rearing process – incubation, chawki rearing, late age worm rearing, moulting and harvesting of cocoons.	
10	Silk worm diseases and pests – Grasserie, Flacherie, Muscardine, Pebrine, Uzi fly and Beetles.	
11	Grainages – production of silk worm eggs.	
12	Physical and commercial characteristics of cocoons.	
13	Reeling and weaving process – stiffling , cooking , brushing, reeling and re-reeling, different types of looms.	
14	Visit to mulberry farm and sericulture centre.	
15	Economics of silk production (Project)	

Text Books and References

1. Govindan , R.,Narayanswami,T.K and Devaiah, M.C.1998,Principles of silk worm pathology.Ser Publishers ,Banglore.
2. Tazima, Y.1964 –The genetics of the silk worm| Logos Press Ltd.London .
3. Tazima Y 1978 The silk worm an important laboratory tool Kodnasha Ltd. Tokyo.
4. Ganga G ,SulochanaChetty J An introduction to sericulture Oxford and IBH Publishing Co.Pvt. Ltd. New Delhi.
5. Ullal and Narasimhanna Hand book of practice sericulture .
6. FAO Manuals on sericulture vol . 1-4.
7. Tazima Y 1958 Silkworm egg CSB Publication ,Bombay .
8. Yashimoro Tanaka 1964 Sericology CSB Publication , Bombay.

Pedagogy

1. Demonstration
2. Assignment
3. Group discussion
4. Field Visit.
5. Use of Audio-Visual aids.

Formative Assessment	
Assessment Occasion	Weightage in Marks
Class Test	05
Attendance and Assignments	05
Visit to Mulberry Farm and Sericulture centre.	05
Total	15

Date:

Course Co-Ordinator

Subject Committee Chairperson



NEP-2021

CURRICULUM STRUCTURE AND SYLLABUS

**Bachelor of Computer Application (Basic and Honors) Programmes
as Major and Minor Courses**

And

Open Elective courses in Computer Applications

w.e.f Academic Year 2021-22 onwards

The objectives of the BCA Program

1. The primary objective of this program is to provide a foundation of computing principles and business practices for effectively using/managing information systems and enterprise software
2. It helps students analyze the requirements for system development and exposes students to business software and information systems
3. This course provides students with options to specialize in legacy application software, system software or mobile applications
4. To produce outstanding IT professionals who can apply the theoretical knowledge into practice in the real world and develop standalone live projects themselves
5. To provide opportunity for the study of modern methods of information processing and its applications.
6. To develop among students the programming techniques and the problem-solving skills through programming
7. To prepare students who wish to go on to further studies in computer science and related subjects.
8. To acquaint students to Work effectively with a range of current, standard, Office Productivity software applications

Program Outcomes: BCA (3 Years) Degree

1. **Discipline knowledge:** Acquiring knowledge on basics of Computer Science and ability to apply to design principles in the development of solutions for problems of varying complexity
2. **Problem Solving:** Improved reasoning with strong mathematical ability to Identify, formulate and analyze problems related to computer science and exhibiting a sound knowledge on data structures and algorithms.
3. **Design and Development of Solutions:** Ability to design and development of algorithmic solutions to real world problems and acquiring a minimum knowledge on statistics and optimization problems. Establishing excellent skills in applying various design strategies for solving complex problems.
4. **Programming a computer:** Exhibiting strong skills required to program a computer for various issues and problems of day-to-day applications with thorough knowledge on programming languages of various levels.
5. **Application Systems Knowledge:** Possessing a sound knowledge on computer application software and ability to design and develop app for applicative problems.
6. **Modern Tool Usage:** Identify, select and use a modern scientific and IT tool or technique for modeling, prediction, data analysis and solving problems in the area of Computer Science and making them mobile based application software.
7. **Communication:** Must have a reasonably good communication knowledge both in oral and writing.
8. **Project Management:** Practicing of existing projects and becoming independent to launch own project by identifying a gap in solutions.
9. **Ethics on Profession, Environment and Society:** Exhibiting professional ethics to maintain the integrality in a working environment and also have concern on societal impacts due to computer-based solutions for problems.
10. **Lifelong Learning:** Should become an independent learner. So, learn to learn ability.
11. **Motivation to take up Higher Studies:** Inspiration to continue educations towards advanced studies on Computer Science.

Additional Program Outcomes: BCA Degree (Hons)

The Bachelor of Computer Application (BCA (Hons)) program enables students to attain following additional attributes besides the afore-mentioned attributes, by the time of graduation:

1. Apply standard Software Engineering practices and strategies in real -time software project development
2. Design and develop computer programs/computer -based systems in the areas related to AI, algorithms, networking, web design, cloud computing, IoT and data analytics.
3. Acquaint with the contemporary trends in industrial/research settings and thereby innovate novel solutions to existing problems
4. The ability to apply the knowledge and understanding noted above to the analysis of a given information handling problem.
5. The ability to work independently on a substantial software project and as an effective team member.

Curriculum for BCA

Sem	Core Courses	Hour / Week		DS Elective Courses	Hous/ Week
		Theory	Lab		
1	i. Fundamentals of Computers ii. Programming in C iii. Mathematical Foundation iv. LAB: Information Technology v. LAB: C Programming	3 3 3	4 4		
2	i. Discrete Mathematical Structures ii. Data Structures using C iii. Object Oriented Concepts using JAVA iv. LAB: Data Structure v. LAB: JAVA Lab	3 3 3	4 4		
3	i. Data Base Management Systems ii. C# and DOT NET Framework iii. Computer Communication and Networks iv. LAB: DBMS v. LAB: C# and DOT NET Framework	3 3 3	4 4		
4	i. Python Programming ii. Computer Multimedia and Animation iii. Operating Systems Concepts iv. LAB: Multimedia and Animation v. LAB: Python programming	3 3 3	4 4		
5	i. Internet Technologies ii. Statistical Computing and R Programming iii. Software Engineering iv. LAB: R Programming v. LAB: JAVA Script, HTML and CSS vi. Vocational 1	3 3 3 3	4 4	(a) Cyber Law and CyberSecurity (b) Cloud Computing (c) Business Intelligence	3 3 3
6	i. Artificial Intelligence and Applications ii. PHP and MySQL iii. LAB: PHP and MySQL iv. PROJECT: v. Vocational 2	3 3 3	4 12	(a) Fundamentals of DataScience (b) Mobile Application Development (c) Embedded Systems	3 3 3
7	i. Analysis and Design of Algorithms ii. Data Mining and Knowledge Management iii. LAB: Algorithms iv. LAB: Data Mining and Knowledge Management v. Vocational 3	3 3	4 4	(a) Data Compression (b) IoT (c) Data Analytics	3 3 3
8	i. Automata Theory and Compiler Design ii. Cryptography and Network Security iii. Compiler Lab iv. LAB: Project v. Vocational 4	3 3 3	4 12	(a) Open-Source Programming (b) Storage Area Networks (c) Pattern Recognition (a) Machine Learning	3 3 3 3

TABLE I: COURSE STRUCTURE FOR BCA.

Semester	Course Code	Title of the Paper	Credit	Total Credit of OE, Languages, CAE, Voc, AECC, SEC	Total Credit
I	CAC01	Fundamentals of Computers	3	13	26
	CAC02	Programming in C	3		
	CAC03(a)/(b)	Mathematical Foundation	3		
	CAC01P	LAB: Information Technology	2		
	CAC02P	LAB: C Programming	2		
II	CAC04	Data Structures using C	3	13	26
	CAC05	Object Oriented Concepts using JAVA	3		
	CAC06	Discrete Mathematical Structures	3		
	CAC04 P	LAB: Data Structure	2		
	CAC05 P	LAB: JAVA	2		
III	CAC07	Data Base Management Systems	3	13	26
	CAC08	C# and DOT NET Framework	3		
	CAC09	Computer Communication and Networks	3		
	CAC07P	LAB: DBMS	2		
	CAC08P	LAB: C# and DOT NET Framework	2		
IV	CAC10	Python Programming	3	13	26
	CAC11	Computer Multimedia and Animation	3		
	CAC12	Operating System Concepts	3		
	CAC10P	LAB: Python programming	2		
	CAC11P	LAB: Multimedia and Animation	2		
V	CAC13	Internet Technologies	3	10	23
	CAC14	Statistical Computing and R Programming	3		
	CAC15	Software Engineering	3		
	CAC13P	LAB: JAVA Script, HTML and CSS	2		
	CAC14P	LAB: R Programming	2		
VI	CAC16	PHP and MySQL	3	10	23
	CAC17	Artificial Intelligence and Applications	3		
	CAC16P	LAB: PHP and MySQL	2		
	CA-P1	Project Work	5		
VII	CAC18	Analysis and Design of Algorithms	3	11	21
	CAC19	Data Mining and Knowledge Management	3		
	CAC18P	LAB: Algorithms	2		
	CAC19P	LAB: Data Mining	2		
	CAI01	Internship	2		
VIII	CAC20	Automata Theory and Compiler Design	3	6	20
	CAC21	Cryptography and Network Security	3		
	CAC20P	LAB: Compiler Lab	2		
	CAP02	Project Work	6		

TABLE II: CS COURSE DETAILS FOR BCA

Course-Type	Course Code as referred above	Compulsory/ Elective	List of compulsory courses and list of option of elective courses. (A suggestive list)
CA	CAC01, CAC02, CAC03(a)/(b), CAC04, CAC05, CAC06, CAC07, CAC08, CAC09, CAC10, CAC11, CAC12, CAC13, CAC14, CAC15, CAC16, CAC17, CAC18, CAC19, CAC20, CAC21	Compulsory	As Mentioned in Table I
CA E	CAE-1A	Elective	Cyber Law and Cyber Security OR Business Intelligence OR Fundamentals of Data Science
	CAE-2A	Elective	Fundamentals of Data Science OR Mobile Application Development OR Embedded Systems
	CAE-3A	Elective	Data Compression OR Internet of Things (IoT) OR Data Analytics
	CAE-4A	Elective	Open-source Programming OR Storage Area Networks OR Pattern Recognition OR Machine Learning
Vocational	Vocational -1	Elective	DTP, CAD and Multimedia OR Hardware and Server Maintenance OR Web Content Management Systems OR Computer Networking OR Health Care Technologies OR Digital Marketing OR Office Automation
	Vocational -2	Elective	
	Vocational -3	Elective	
	Vocational -4	Elective	
SEC	SEC 1	Compulsory	Health & Wellness/ Social & Emotional Learning
	SEC 2	Compulsory	Sports/NCC/NSS etc
	SEC 3	Compulsory	Ethics & Self Awareness
	SEC 4	Compulsory	Professional Communication
AECC	AECC1	Compulsory	Environmental Studies
	AECC2	Compulsory	Constitution of India
Language 1	L1-1, L1-2, L1-3, L1-4	Compulsory	Kannada/Functional Kannada
Language 2	L2-1, L2-2, L2-3, L4-4	Elective	English/Hindi/French/ Additional English/ etc.

Computer Application Core Courses (CA C) for BCA (Hons)

Sl. No	Course Code	Title of the Paper
1	CAC01	Fundamentals of Computers
2	CAC02	Programming in C
3	CAC03 (a)/(b)	Mathematical Foundation/ Accountancy
4	CAC04	Discrete Mathematical Structures
5	CAC05	Object Oriented Concepts using JAVA
6	CAC06	Data Structures using C
7	CAC07	Data Base Management Systems
8	CAC08	C# and DOT NET Framework
9	CAC09	Computer Communication and Networks
10	CAC10	Python Programming
11	CAC11	Computer Multimedia and Animation
12	CAC12	Operating System Concepts
13	CAC13	Internet Technologies
14	CAC14	Statistical Computing and R Programming
15	CAC15	Software Engineering
16	CAC16	PHP and MySQL
17	CAC17	Artificial Intelligence and Applications
18	CAC18	Analysis and Design of Algorithms
19	CAC19	Data Mining and Knowledge Management
20	CAC20	Automata Theory and Compiler Design
21	CAC21	Cryptography and Network Security

Computer Application Electives (CA E) for BCA (Hons)

Sl. No	Computer Application Electives (CA E)
1	Business Intelligence
02	Cyber Law and Cyber Security
3	Data Analytics
4	Data Compression
5	Embedded Systems
6	Fundamentals of Data Science
7	Internet of Things (IoT)
8	Machine Learning
9	Mobile Application Development
10	Open-source Programming
11	Pattern Recognition
12	Storage Area Networks

Vocational Electives

Sl. No	Vocational Electives
1	DTP, CAD and Multimedia
2	Hardware and Server Maintenance
3	Web Content Management Systems
4	Computer Networking
5	Health Care Technologies
6	Digital Marketing
7	Office Automation

Open Electives in Computer Applications:

- Office Automation
- Computer Fundamentals
- Problem Solving and C Programming Concepts
- Python Programming Concepts
- Web Designing
- Accounting Package
- E-Commerce
- Multimedia Processing
- R Programming
- E-Content Development
- Computer Animation

Syllabus for BCA (Basic and Honors) 1st and 2nd Semesters

Semester: I

Course Code: CAC01	Course Title: Fundamentals of Computers
Course Credits: 03	Hours/Week: 03
Total Contact Hours: 42	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 03

Course Outcomes (COs):

- Introduction to computers, classification of computers, anatomy of computer, constituents and architecture, microcontrollers
- Operating systems, functions of operating systems, classification of operating systems, kernel, shell, basics of Unix, shell programming, booting
- Databases, why databases are used, users, SQL, data types in SQL, introduction of queries - select, alter, update, delete, truncate, using where, and or in not in
- Internet basics, features, applications, services, internet service providers, domain name system, browsing, email, searching
- Web Programming basics, introduction of HTML and CSS programming
- Introduction of computers, classification of computers, anatomy of computer, constituents and architecture, microcontrollers.

Course Content

Content	Hours
Unit - 1	
Fundamentals of Computers: Introduction to Computers - Computer Definition, Evolution and History of Computers, Basic Organisation of a Digital Computer; Number Systems – different types, conversion from one number system to another; Computer Codes – BCD, Gray Code, ASCII and Unicode; Boolean Algebra – Boolean Operators with Truth Tables; Types of Software – System Software and Utility Software; Computer Languages - Machine Level, Assembly Level & High Level Languages, Translator Programs – Assembler, Interpreter and Compiler; Planning a Computer Program - Algorithm, Flowchart and Pseudo code with Examples (at least 5 hours of teaching).	10

Unit-2

<p>Introduction to Computer: Characteristics of computers, Classification of Digital Computer Systems: Microcomputers, Minicomputers, Mainframes, Super computers.</p> <p>Anatomy of Computer: Introduction, Functions & Components of a Computer, Central Processing Unit, Storage units, Input and output Devices. How CPU and memory works. Program execution with illustrative examples. Introduction to microcontrollers.</p>	10
Unit-3	
<p>Operating System Fundamentals: Operating Systems: Introduction, Functions of an operating System, Classification of Operating Systems, System programs, Application programs, Utilities, The Unix Operating System, Basic Unix commands, Microkernel Based Operating System, Booting.</p>	08
Unit-4	
<p>Introduction to Database Management Systems: Database, DBMS, Why Database -File system vs DBMS, Database applications, Database users, Introduction to SQL, Data types, Classification of SQL-DDL with constraints, DML, DCL, TCL</p>	08
Unit-5	
<p>Internet Basics: Introduction, Features of Internet, Internet application, Services of Internet, Logical and physical addresses, Internet Service Providers, Domain Name System.</p> <p>Web Basics: Introduction to web, web browsers, http/https, URL, HTML5, CSS</p>	06

Text Books:

1. Pradeep K. Sinha and Priti Sinha: Computer Fundamentals (Sixth Edition), BPB Publication
2. David Riley and Kenny Hunt, Computational thinking for modern solver, Chapman & Hall/CRC,

Reference:

1. J. Glenn Brook shear," Computer Science: An Overview", Addison-Wesley, Twelfth Edition,
2. R.G. Dromey, "How to solve it by Computer", PHI,

Course Code: CAC01P	Course Title: Information Technology Lab
Course Credits: 02	Hours/Week: 04
Total Contact Hours: 52	Formative Assessment Marks: 10
Exam Marks: 40	Exam Duration: 04

Part A:

1. Activities using Word Processor Software
2. Activities using Spreadsheets Software
3. Activities using Presentation Software
4. Activities involving Multimedia Editing (Images, Video, Audio ...)
5. Tasks involving Internet Browsing

Part B:

1. Flow charts: Installation and using of flowgarithms software for different arithmetic tasks like sum, average, product, difference, quotient and remainder of given numbers, calculate area of Shapes (Square, Rectangle, Circle and Triangle),decision making and looping, arrays and recursion(at least 10 problems covering all concepts).

NOTE: In addition to the ones listed above, universities can include other activities so as for the student to become proficient in using personal computers for multiple purposes for which modern computers can be put to use.

Reference:

1. Computational Thinking for the Modern Problem Solver, By Riley DD, Hunt K.A CRC press, 2014
2. Ferragina P, Luccio F. Computational Thinking: First Algorithms, Then Code. Springer

Web References:

<http://www.flowgorithm.org/documentation/>

Evaluation Scheme for Lab Examination

Assessment Criteria		Marks
Activity - 1 from Part A	Write up on the activity/ task	5
	Demonstration of the activity/ task	10
Activity-2 from Part B	Write up on the activity/ task	5
	Demonstration of the activity/ task	10
Viva Voce based on Lab Activities		05
Practical Records		05
Total		40

Course Code: CAC02	Course Title: Programming in C
Course Credits: 03	Hours/Week: 03
Total Contact Hours: 42	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 03

Course Outcomes (COs):

After completing this course satisfactorily, a student will be able to:

- Confidently operate Desktop Computers to carry out computational tasks
- Understand working of Hardware and Software and the importance of operating systems
- Understand programming languages, number systems, peripheral devices, networking, multimedia and internet concepts
- Read, understand and trace the execution of programs written in C language
- Write the C code for a given problem
- Perform input and output operations using programs in C
- Write programs that perform operations on arrays

Course Content

Content	Hours
Unit - 1	
Introduction to C Programming: Overview of C; History and Features of C; Structure of a C Program with Examples; Creating and Executing a C Program; Compilation process in C.	5
C Programming Basic Concepts: C Character Set; C tokens - keywords, identifiers, constants, and variables; Data types; Declaration & initialization of variables; Symbolic constants.	
Unit-2	
Input and output with C: Formatted I/O functions - <i>printf</i> and <i>scanf</i> , control strings and escape sequences, output specifications with <i>printf</i> functions; Unformatted I/O functions to read and display single character and a string - <i>getchar</i> , <i>putchar</i> , <i>gets</i> and <i>puts</i> functions.	4
Unit-3	
C Operators & Expressions: Arithmetic operators; Relational operators; Logical operators; Assignment operators; Increment & Decrement operators; Bitwise operators; Conditional operator; Special operators; Operator Precedence and Associativity; Evaluation of arithmetic expressions; Type conversion.	11

<p>Control Structures: Decision making Statements - <i>Simple if, if_else, nested if_else, else_if ladder, Switch Case, goto, break & continue</i> statements; Looping Statements - Entry controlled and exit controlled statements, <i>while, do-while, for</i> loops, Nested loops.</p>	
<p>Unit - 4</p>	
<p>Arrays: One Dimensional arrays - Declaration, Initialization and Memory representation; Two Dimensional arrays - Declaration, Initialization and Memory representation.</p> <p>Pointers in C: Understanding pointers - Declaring and initializing pointers, accessing address and value of variables using pointers; Pointers and Arrays; Pointer Arithmetic; Advantages and disadvantages of using pointers;</p>	12
<p>Unit-5</p>	
<p>User Defined Functions: Need for user defined functions; Format of C user defined functions; Components of user defined functions - return type, name, parameter list, function body, return statement and function call; Categories of user defined functions - With and without parameters and return type.</p> <p>User defined data types: Structures - Structure Definition, Advantages of Structure, declaring structure variables, accessing structure members, Structure members initialization, comparing structure variables, Array of Structures; Unions - Union definition; difference between Structures and Unions.</p>	10

Text Books:

1. C: The Complete Reference, By Herbert Schildt.
2. M.T Somashekara, D.S Guru and K.S. Manjunatha: Problem solving with C, PHI publication
3. C Programming Language, By Brain W. Kernighan
4. Kernighan & Ritchie: The C Programming Language (PHI)

Reference Books:

1. P. K. Sinha & Priti Sinha: Computer Fundamentals (BPB)
2. E. Balaguruswamy: Programming in ANSI C (TMH)
3. Kamthane: Programming with ANSI and TURBO C (Pearson Education)
4. V. Rajaraman: Programming in C (PHI – EEE)
5. S. Byron Gottfried: Programming with C (TMH)
6. Yashwant Kanitkar: Let us C
7. P.B. Kottur: Programming in C (Sapna Book House).

Course Code: CAC02P	Course Title: C Programming Lab
Course Credits: 02	Hours/Week: 04
Total Contact Hours: 52	Formative Assessment Marks:10
Exam Marks: 40	Exam Duration: 04

Programming LabPart A:

1. Write a C Program to read radius and find area and volume of a sphere.
2. Write a C Program to read three numbers and find the biggest of three
3. Write a C Program to demonstrate library functions in *math.h* (at least 5)
4. Write a C Program to read a number, find the sum of the digits, reverse the number and check it for palindrome
5. Write a C Program to read numbers from keyboard continuously till the user presses 999 and to find the sum of only positive numbers
6. Write a C Program to read percentage of marks and to display appropriate grade (using switch case)
7. Write a C Program to find the roots of quadratic equation (if else ladder)
8. Write a C program to read marks scored in 3 subjects by n students and find the average of marks and result (Demonstration of single dimensional array)
9. Write a C Program to remove Duplicate Element in a single dimensional Array
10. Program to perform addition and subtraction of Matrices

Part B:

1. Write a C Program to find the length of a string without using built in function
2. Write a C Program to demonstrate string functions (at least 3).
3. Write a C Program to demonstrate pointers in C
4. Write a C Program to generate n prime number by defining *isprime ()* function
5. Write a C Program to find the trace of a square matrix using function
6. Write a C Program to read, display and multiply two matrices using functions
7. Write a C Program to read a string and to find the number of alphabets, digits, vowels, consonants, spaces and special characters.
8. Write a C Program to Reverse a String using Pointer
9. Write a C Program to demonstrate student structure to read & display records of n students.
10. Write a C Program to demonstrate the difference between structure & union.

Note: Student has to execute a minimum of 8 programs in each part to complete the Lab course

Evaluation Scheme for Lab Examination

Assessment Criteria		Marks
Program – 1 from Part B	Flowchart / Algorithm	02
	Writing the Program	05
	Execution and Formatting	08
Program -2 from Part B	Flowchart/Algorithm	02
	Writing the Program	05
	Execution and Formatting	08
Viva Voce based on C Programming		05
Practical Record		05
Total		40

Course Code: CAC03(a)	Course Title: Mathematical Foundation
Course Credits: 03	Hours/Week: 03
Total Contact Hours: 42	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 03

Course Outcomes (COs):

- Study and solve problems related to connectives, predicates and quantifiers under different situations.
- Develop basic knowledge of matrices and to solve equations using Cramer's rule.
- Know the concept of Eigen values.
- To develop the knowledge about derivatives and know various applications of differentiation.
- Understand the basic concepts of Mathematical reasoning, set and functions

Content	Hours
Unit - 1	
Mathematical logic: Mathematical logic introduction-statements Connectives-negation, conjunction, disjunction- statement formulas and truth tables-conditional and bi Conditional statements- tautology contradiction-equivalence of formulas-duality law-Predicates and Quantifiers, Arguments.	10
Unit - 2	
sets and Functions: power set- Venn diagram Cartesian product-relations - functions- types of functions - composition of functions.	10
Unit - 3	
Matrices and determinant: Introduction-Types of matrices-matrix operations-transpose of a matrix -determinant of matrix - inverse of a matrix-Cramer's rule	10
Unit - 4	
Matrix algebra: finding rank of a matrix – normal form-echelon form Cayley Hamilton theorem-Eigen values.	06
Unit -5	
Differential calculus: Functions and limits - Simple Differentiation of Algebraic Functions – Evaluation of First and Second Order Derivatives – Maxima and Minima	06

Text Books:

P. R. Vittal-Business Mathematics and Statistics, Margham Publications, Chennai,

Reference Books:

B. S. Vatsa-Discrete Mathematics –New Age International Limited Publishers, NewDelhi

Semester: II

Course Code: CAC04	Course Title: Data Structures using C
Course Credits: 03	Hours/Week: 03
Total Contact Hours: 42	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 03 Hours

Course Outcomes (COs):

After completing this course satisfactorily, a student will be able to:

- Describe how arrays, records, linked structures, stacks, queues, trees, and graphs are represented in memory and used by algorithms
- Describe common applications for arrays, records, linked structures, stacks, queues, trees, and graphs
- Write programs that use arrays, records, linked structures, stacks, queues, trees, and graphs
- Demonstrate different methods for traversing trees
- Compare alternative implementations of data structures with respect to performance
- Describe the concept of recursion, give examples of its use
- Discuss the computational efficiency of the principal algorithms for sorting, searching, and hashing

Course Content

Content	Hours
Unit - 1	
Introduction to data structures: Definition; Types of data structures - Primitive & Non-primitive, Linear and Non-linear; Operations on data structures. Algorithm Specification, Performance Analysis, Performance Measurement Recursion: Definition; Types of recursions; Recursion Examples - Fibonacci numbers, GCD, Binomial coefficient nCr , Towers of Hanoi; Comparison between iterative and recursive functions.	08
Unit - 2	
Arrays: Basic Concepts – Definition, Declaration, Initialization, Operations on arrays; Types of arrays; Arrays as abstract data types (ADT); Representation of Linear Arrays in memory; Traversing linear arrays; Inserting and deleting elements; Sorting – Selection sort, Bubble sort, Quick sort, Insertion sort, merge sort; Searching - Sequential Search, Binary search; Iterative and Recursive searching; Multidimensional arrays; Representation of multidimensional arrays; Sparse matrices.	12
Unit - 3	

<p>Stacks: Basic Concepts – Definition and Representation of stacks; Operations on stacks; Applications of stacks; Infix, postfix and prefix notations; Conversion from infix to postfix using stack; Evaluation of postfix expression using stack; Application of stack in function calls.</p> <p>Queues: Basic Concepts – Definition and Representation of queues; Types of queues – Simple queues, Circular queues, Double ended queues, Priority queues; Operations on Simple queues;</p>	10
Unit-4	
<p>Dynamic memory allocation: Static & Dynamic memory allocation; Memory allocation and de- allocation functions - malloc, calloc, realloc and free.</p> <p>Linked list: Basic Concepts – Definition and Representation of linked list, Types of linked lists - Singly linked list, Doubly linked list, Header linked list, Circular linked list; Representation of Linked list in Memory; Operations on Singly linked lists – Traversing, Searching, Insertion, Deletion; Memory allocation; Garbage collection.</p>	12
Unit-5	
<p>Trees: Definition; Tree terminologies –node, root node, parent node, ancestors of a node, siblings, terminal & non-terminal nodes, degree of a node, level, edge, path, depth; Binary tree: Type of binary trees - strict binary tree, complete binary tree, binary search tree and heap tree; Array representation of binary tree. Traversal of binary tree; preorder, inorder and postorder traversal; Reconstruction of a binary tree when any two of the traversals are given.</p>	10

Text Books

1. Ellis Horowitz and Sartaj Sahni: Fundamentals of Data Structures

References

1. Tanenbaum: Data structures using C (Pearson Education)
2. Kamathane: Introduction to Data structures (Pearson Education)
3. Y. Kanitkar: Data Structures Using C (BPB)
4. Kottur: Data Structure Using C
5. Padma Reddy: Data Structure Using C
6. Sudipa Mukherjee: Data Structures using C – 1000 Problems and Solutions (McGraw Hill Education, 2007))

Course Code: CAC04P	Course Title: Data Structures Lab
Course Credits: 02	Hours/Week: 04
Total Contact Hours: 52	Formative Assessment Marks: 10
Exam Marks: 40	Exam Duration: 03 Hours

Programming Lab

Part A:

1. Write a C Program to find GCD using recursive function
2. Write a C Program to display Pascal Triangle using binomial function
3. Write a C Program to generate n Fibonacci numbers using recursive function.
4. Write a C Program to implement Towers of Hanoi.
5. Write a C Program to implement dynamic array, find smallest and largest element of the array.
6. Write a C Program to read the names of cities and arrange them alphabetically using bubble sort.
7. Write a C Program to sort the given list using selection sort technique.
8. Write a C Program to sort the given list using insertion sort technique.

Part B:

1. Write a C Program to sort the given list using quick sort technique.
2. Write a C Program to sort the given list using merge sort technique.
3. Write a C Program to search an element using linear search technique and recursive binary search technique.
4. Write a C Program to implement Stack.
5. Write a C Program to convert an infix expression to postfix.
6. Write a C Program to implement simple queue.
7. Write a C Program to implement linear linked list.
8. Write a C Program to implement traversal of a binary tree.

Evaluation Scheme for Lab Examination

Assessment Criteria		Marks
Program - 1 from Part A	Algorithm	02
	Writing the Program	05
	Execution and Formatting	05
Program -2 from Part B	Algorithm	04
	Writing the Program	06
	Execution and Formatting	08
Viva Voce based on Data structures		05
Practical Record		05
Total		40

Course Code: CAC05	Course Title: Object Oriented Programming with JAVA
Course Credits: 03	Hours/Week: 03
Total Contact Hours: 42	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 03 Hours

Course Outcomes (COs):

After completing this course satisfactorily, a student will be able to:

- Understand the features of Java and the architecture of JVM
- Write, compile, and execute Java programs that may include basic data types and control flow constructs and how type casting is done
- Identify classes, objects, members of a class and relationships among them needed for a specific problem and demonstrate the concepts of polymorphism and inheritance
- The students will be able to demonstrate programs based on interfaces and threads and explain the benefits of JAVA's Exceptional handling mechanism compared to other Programming Language
- Write, compile, execute Java programs that include GUIs and event driven programming and also programs based on files

Course Content

Content	Hours
Unit - 1	
Introduction to OOPS and Java: OOPS concepts and paradigm, Basics of Java programming, Data types, Variables, Operators, Control structures including selection, Looping, method Overloading, Math class, Arrays in java.	08
Unit - 2	
Objects and Classes: Basics of objects and classes in java, Constructors, Finalizer, Visibility modifiers, Methods and objects, Inbuilt classes like String, Character, String Buffer, File, this reference, I/O streams.	10
Unit-3	
Inheritance and Polymorphism: Inheritance in java, Super and sub class, Overriding, Object class, Polymorphism, Dynamic binding, Generic programming, Casting objects, Instance of operator, Abstract class, Interface in java, Package in java, UTIL package.	08
Unit-4	

Multithreading in java: Thread life cycle and methods, Runnable interface, Thread synchronization, Exception handling with try catch-finally, Collections in java, Introduction to JavaBeans and Network Programming.	6
Unit - 5	
Event and GUI programming: Event handling in java, Event types, Mouse and key events, GUI Basics, Panels, Frames, Layout Managers: Flow Layout, Border Layout, Grid Layout, GUI components like Buttons, Check Boxes, Radio Buttons, Labels, Text Fields, Text Areas, Combo Boxes, Lists, Scroll Bars, Sliders, Windows, Menus, Dialog Box, Applet and its life cycle, Introduction to swing.	10

Text Books

1. Programming with Java, By E Balagurusamy – A Primer, Fourth Edition, Tata McGraw Hill Education Private Limited.
2. Core Java Volume I – Fundamentals, By Cay S. Horstmann, Prentice Hall
3. Object Oriented Programming with Java : Somashekara, M.T., Guru, D.S., Manjunatha, K.S

Reference Books:

1. Java 2 - The Complete Reference – McGraw Hill publication.
2. Java - The Complete Reference, 7th Edition, By Herbert Schildt– McGraw Hill publication.

Course Code: CAC05P	Course Title: JAVA Lab
Course Credits: 02	Hours/Week: 04
Total Contact Hours: 52	Formative Assessment Marks: 10
Exam Marks: 40	Exam Duration: 04 Hours

Course Outcomes (COs):

After completing this course satisfactorily, a student will be able to:

- Implement Object Oriented programming concept using basic syntaxes of control Structures
- Identify classes, objects, members of a class and the relationships among them needed for a finding the solution to specific problem
- Demonstrates how to achieve reusability using inheritance
- Demonstrate understanding and use of interfaces, packages, different exception handling mechanisms and concept of multithreading for robust faster and efficient application development.
- Identify and describe common user interface components to design GUI in Java using Applet & AWT along with response to events

Practice Lab

1. Program to print the following triangle of numbers
1
1 2
1 2 3
1 2 3 4
1 2 3 4 5
2. Program to simple java application, to print the message, "Welcome to java"
3. Program to display the month of a year. Months of the year should be held in an array.
4. Program to find the area of rectangle.
5. program to demonstrate a division by zero exception
6. Program to create a user defined exception say Pay Out of Bounds.

Programming Lab

PART A: Java Fundamentals OOPs in Java

1. Program to add two integers and two float numbers. When no arguments are supplied, give a default value to calculate the sum. Use function overloading.

2. Program to perform mathematical operations. Create a class called AddSub with methods to add and subtract. Create another class called MulDiv that extends from AddSub class to use the member data of the super class. MulDiv should have methods to multiply and divide A main function should access the methods and perform the mathematical operations.
3. Program with class variable that is available for all instances of a class. Use static variable declaration. Observe the changes that occur in the object's member variable values.
4. Program to create a student class with following attributes;
Enrollment No: Name, Mark of sub1, Mark of sub2, mark of sub3, TotalMarks. Total of the three marks must be calculated only when the student passes in all three subjects. The pass mark for each subject is 50. If a candidate fails in any one of the subjects his total mark must be declared as zero. Using this condition write a constructor for this class. Write separate functions for accepting and displaying student details. In the main method create an array of n student objects and display the details.
5. In a college first year class are having the following attributes Name of the class (BCA, BCom, BSc), Name of the staff No of the students in the class, Array of students in the class. Define a class called first year with above attributes and define a suitable constructor. Also write a method called best Student () which process a first-year object and return the student with the highest total mark. In the main method define a first-year object and find the best student of this class
6. Program to define a class called employee with the name and date of appointment. Create ten employee objects as an array and sort them as per their date of appointment. ie, print them as per their seniority.

PART B: Exception Handling & GUI Programming

1. Program to catch Negative Array Size Exception. This exception is caused when the array is initialized to negative values.
2. Program which create and displays a message on the window
3. Program to draw several shapes in the created window
4. Program which creates a frame with two buttons father and mother. When we click the father button the name of the father, his age and designation must appear. When we click mother similar details of mother also appear.
5. Program to move any one shape according to the arrow key pressed.
6. Program to create a window when we press M or m the window displays Good Morning, A or a the window displays Good After Noon E or e the window displays Good Evening, N or n the window displays Good Night
7. Demonstrate the various mouse handling events using suitable example.
8. Program to create menu bar and pull-down menus.

Evaluation Scheme for Lab Examination

Assessment Criteria		Marks
Program - 1 from Part A		
	Writing the Program	07
	Execution and Formatting	08
Program -2 from Part B		
	Writing the Program	07
	Execution and Formatting	08
Viva Voce based on C Programming		05
Practical Record		05
Total		40

Course Code: CAC06	Course Title: Discrete Mathematical Structures
Course Credits: 03	Hours/Week: 03
Total Contact Hours: 42	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 03 Hours

Course Outcomes (COs):

After completing this course satisfactorily, a student will be able to:

- To understand the basic concepts of Mathematical reasoning, set and functions.
- To understand various counting techniques and principle of inclusion and exclusions.
- Understand the concepts of various types of relations, partial ordering and equivalence relations.
- Apply the concepts of generating functions to solve the recurrence relations.
- Familiarize the fundamental concepts of graph theory and shortest path algorithm

Course Content

Content	Hours
Unit - 1	
The Foundations: Logic and proofs: Propositional Logic, Applications of Propositional Logic, Propositional Equivalences, Predicates and Quantifiers, Nested Quantifiers, Rules of Inference, Introduction to Proofs, Proof Methods and Strategy.	12
Basic Structures: Sets, Functions, Sequences, Sums, and Matrices: Sets, set operations, Functions, Sequences and Summations, matrices.	
Unit - 2	
Counting: Basics of counting, Pigeonhole principle, Permutation and combination, Binomial Coefficient and Combination, Generating Permutation and Combination.	10
Advanced Counting Techniques: Applications of Recurrence Relations, Solving Linear Recurrence, Relations, Divide and Conquer Algorithms and Recurrence Relations, Generating functions, Inclusion-Exclusion, Applications of Inclusion-exclusion	

Unit - 3	
Induction and Recursion: Mathematical Induction, Strong Induction and Well-Ordering, Recursive Definitions and Structural Induction, Relation: Properties of relation, Composition of relation, Closer operation on relation, Equivalence relation and partition. Operation on relation, Representing relation.	12
Unit-4	
Graphs: Graphs and Graph models, Graph Terminology and Special Types of Graphs, Representing Graphs and Graph Isomorphism, Connectivity, Euler and Hamilton Paths, Shortest-Path Problems, Planar Graphs, Graph Coloring.	08

Text Book:

1. Discrete Mathematics and Its Applications, Kenneth H. Rosen: Seventh Edition, 2012.

References:

2. Discrete Mathematical Structure, Bernard Kolman, Robert C, Busby, Sharon Ross, 2003.
3. Graph Theory with Applications to Engg and Comp. Sci: Narsingh Deo-PHI 1986.
4. Discrete and Combinatorial Mathematics Ralph P. Grimaldi, B. V. Ramatta, Pearson, Education, 5 Edition.
5. Discrete Mathematical Structures, Trembley and Manohar.

Note: The syllabi of the courses of remaining semesters shall be framed in subsequent BoS meetings.

Syllabus for Open Electives in Computer Applications:

Course Code: CAOE01	Course Title: Computer Fundamentals
Course Credits: 03	Hours/Week: 03
Total Contact Hours: 42	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 03 Hours

Course Outcomes (COs):

- Introduction to computers, classification of computers, anatomy of computer, constituents and architecture, microcontrollers
- Operating systems, functions of operating systems, classification of operating systems, kernel, shell, basics of Unix, shell programming, booting
- Databases, why databases are used, users, SQL, data types in SQL, introduction of queries - select, alter, update, delete, truncate, using where, and or in not in
- Internet basics, features, applications, services, internet service providers, domain name system, browsing, email, searching
- Web Programming basics, introduction of HTML and CSS programming
- Introduction of computers, classification of computers, anatomy of computer, constituents and architecture, microcontrollers.

Course Content

Content	Hours
Unit - 1	
Fundamentals of Computers: Introduction to Computers - Computer Definition, Evolution and History of Computers, Basic Organisation of a Digital Computer; Number Systems – different types, conversion from one number system to another; Computer Codes – BCD, Gray Code, ASCII and Unicode; Boolean Algebra – Boolean Operators with Truth Tables; Types of Software – System Software and Utility Software; Computer Languages - Machine Level, Assembly Level & High Level Languages, Translator Programs – Assembler, Interpreter and Compiler; Planning a Computer Program - Algorithm, Flowchart and Pseudo code with Examples(at least 5 hours of teaching .	10
Unit-2	

<p>Introduction to Computer: Characteristics of computers, Classification of Digital Computer Systems: Microcomputers, Minicomputers, Mainframes, Super computers.</p> <p>Anatomy of Computer: Introduction, Functions & Components of a Computer, Central Processing Unit, Storage units, Input and output Devices. How CPU and memory works. Program execution with illustrative examples. Introduction to microcontrollers.</p>	10
Unit-3	
<p>Operating System Fundamentals: Operating Systems: Introduction, Functions of an operating System, Classification of Operating Systems, System programs, Application programs, Utilities, The Unix Operating System, Basic Unix commands, Microkernel Based Operating System, Booting.</p>	08
Unit-4	
<p>Introduction to Database Management Systems: Database, DBMS, Why Database -File system vs DBMS, Database applications, Database users, Introduction to SQL, Data types, Classification of SQL-DDL with constraints, DML, DCL, TCL</p>	08
Unit-5	
<p>Internet Basics: Introduction, Features of Internet, Internet application, Services of Internet, Logical and physical addresses, Internet Service Providers, Domain Name System.</p> <p>Web Basics: Introduction to web, web browsers, http/https, URL, HTML5, CSS</p>	06

Text Books:

3. Pradeep K. Sinha and Priti Sinha: Computer Fundamentals (Sixth Edition), BPB Publication
4. David Riley and Kenny Hunt, Computational thinking for modern solver, Chapman & Hall/CRC,

Reference:

3. J. Glenn Brook shear," Computer Science: An Overview", Addison-Wesley, Twelfth Edition,
4. R.G. Dromey, "How to solve it by Computer", PHI,

Course Code: CAOEO2	Course Title: Problem Solving and C Programming Concepts
Course Credits: 03	Hours/Week: 03
Total Contact Hours: 42	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 03 Hours

Course Outcomes (COs):

- Introduction to computers, classification of computers, anatomy of computer, constituents and architecture, microcontrollers
- Operating systems, functions of operating systems, classification of operating systems, kernel, shell, basics of Unix, shell programming, booting
- Databases, why databases are used, users, SQL, data types in SQL, introduction of queries - select, alter, update, delete, truncate, using where, and or in not in
- Internet basics, features, applications, services, internet service providers, domain name system, browsing, email, searching
- Web Programming basics, introduction of HTML and CSS programming
- Introduction of computers, classification of computers, anatomy of computer, constituents and architecture, microcontrollers.

Course Content

Content	Hours
Unit - 1	
Problem Solving Techniques: Problem solving techniques – problem definition, analysis, design, debugging, testing, documentation and maintenance. Design Tools -ALGORITHM: definition, characteristics, advantages and disadvantages. FLOWCHART - definition, symbols, advantages and disadvantages. Writing an algorithm and flowchart: Area of circle, arithmetical operations, simple interest and compound interest, quadratic equation, largest of three numbers, sum of N natural numbers, factorial of number, Fibonacci series, prime number, reverse a given number, evaluation of series like $\sin(x)$, $\cos(x)$, e^x , $\log(x)$ etc.	10
Unit-2	
Introduction to C Programming: Overview of C; History and Features of C; Structure of a C Program with Examples; Creating and Executing a C Program; Compilation process in C. C Programming Basic Concepts: C Character Set; C tokens - keywords, identifiers, constants, and variables; Data types; Declaration & initialization of variables; Symbolic constants, Formatted I/O functions - <i>printf</i> and <i>scanf</i> ,	10

Unit-3	
C Operators & Expressions: Arithmetic operators; Relational operators; Logical operators; Assignment operators; Increment & Decrement operators; Bitwise operators; Conditional operator; Special operators; Operator Precedence and Associativity; Evaluation of arithmetic expressions; Type conversion.	08
Unit-4	
Decision making, branching and looping: Decision making - if and if-else statement, nested if, else if ladder, switch statements, conditional operator, goto statement. Looping - while, do-while and for, nested for. break and continue statements. Programs on these concepts.	08
Unit-5	
Arrays: One Dimensional arrays - Declaration, Initialization and Memory representation; Two Dimensional arrays -Declaration, Initialization and Memory representation.	06

References :

1. Computer Concepts and Programming, Padma Reddy
2. Let us C , Yashwanth Kanetkar
3. Ansi C, Balagurusamy
4. Problem solving with C, M. T. Somashekara and D. S. Guru

Course Code: CAO E03	Course Title: Office Automation
Course Credits: 03	Hours/Week: 03
Total Contact Hours: 42	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 03 Hours

Course Content

Content	Hours
Unit - 1	
Windows Desk top - GUI: Definition, Standards, Cursors/Pointers, Icons, GUI Menus, GUI-Share Data – Desktop icons and their functions: My computer, My documents, Network neighbourhood, Recycle Bin, Quick launch tool bar, System tray, Start menu, Task bar – Dialog Boxes: List Box, Spin Control Box, Slide, Drop-down list, Radio button, Check box, Text box, Task Bar - System Tray - Quick launch tool bar - Start button - Parts of Windows -Title bar-Menu bar - Scroll bar- Status bar, Maximize, Minimize, close and Resize & Moving a Window – Windows - Start Menu -Help Menu- Preview Menu; Logoff & Shutdown – Keyboard Accelerators: Key board short keys or hotkeys	06
Unit-2	
MS Word - Working with Documents -Opening & Saving files, Editing text documents, Inserting, Deleting, Cut, Copy, Paste, Undo, Redo, Find, Search, Replace, Formatting page & setting Margins, Converting files to different formats, Importing & Exporting documents, Sending files to others, Using Tool bars, Ruler, Using Icons, using help, Formatting Documents - Setting Font styles, Font selection- style, size, colour etc, Type face - Bold, Italic, Underline, Case settings, Highlighting, Special symbols, Setting Paragraph style, Alignments, Indents, Line Space, Margins, Bullets & Numbering. Setting Page style - Formatting Page, Page tab, Margins, Layout settings, Paper tray, Border & Shading, Columns, Header & footer, Setting Footnotes & end notes – Shortcut Keys; Inserting manual page break, Column break and line break, creating sections & frames, Anchoring & Wrapping, Setting Document styles, Table of Contents, Index, Page Numbering, date & Time, Author etc., Creating Master Documents, Web page. Creating Tables- Table settings,	10

Borders, Alignments, Insertion, deletion, Merging, Splitting, Sorting, and Formula, Drawing - Inserting ClipArt, Pictures/Files etc., Tools – Word Completion, Spell Checks, Mail merge, Templates, Printing Documents – Shortcut keys.	
Unit-3	
MS Excel: Spread Sheet & its Applications, Opening Spreadsheet, Menus - main menu, Formula Editing, Formatting, Toolbars, Using Icons, Using help, Shortcuts, Spreadsheet types. Working with Spreadsheets- opening, saving files, setting Margins, Converting files to different formats (importing, exporting, sending files to others), Spread sheet addressing - Rows, Columns & Cells, Referring Cells & Selecting Cells – Shortcut Keys. Entering & Deleting Data- Entering data, Cut, Copy, Paste, Undo, Redo, Filling Continuous rows, columns, highlighting values, Find, Search & replace, Inserting Data, Insert Cells, Column, rows & sheets, Symbols, Data from external files, Frames, Clipart, Pictures, Files etc., Inserting Functions, Manual breaks, Setting Formula - finding total in a column or row, Mathematical operations (Addition, Subtraction, Multiplication, Division, Exponentiation), Using other Formulae. Formatting Spreadsheets, Formatting layout for Graphics, Clipart etc., Worksheet Row & Column Headers, Sheet Name, Row height & Column width, Visibility - Row, Column, Sheet, Security, Sheet Formatting & style, Sheet background, Colour etc, Borders & Shading – Shortcut keys. Working with sheets – Sorting, Filtering, Validation, Consolidation, and Subtotal. Creating Charts - Drawing. Printing. Using Tools	10
Unit-4	
MS Power point: Introduction to presentation – Opening new presentation, Different presentation templates, setting backgrounds, Selecting presentation layouts. Creating a presentation - Setting Presentation style, Adding text to the Presentation. Formatting a Presentation - Adding style, Colour, gradient fills, arranging objects, Adding Header & Footer, Slide Background, Slide layout. Adding Graphics to the Presentation- Inserting pictures, movies, tables etc into presentation, Drawing Pictures using Draw. Adding Effects to the Presentation- Setting Animation & transition effect. Printing Handouts, Generating Standalone Presentation viewer.	10
Unit-5	

<p>Internet and Web Browsers: Definition of WebAddressing-URL-Different types of Internet Connections; Dial up connection, Broad band (ISDN, DSL, Cable), Wireless (Wi-Fi, WiMax, Satellite, Mobile) naming convention, browsers and its types, internet browsing, searching - Search Engines - Portals - Social Networking sites- Blogs - viewing a webpage, downloading and uploading the website; Creating an email-ID, e-mail reading, saving, printing, forwarding and deleting the mails, checking the mails, viewing and running file attachments, addressing with cc and bcc.</p>	<p>06</p>
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References:

1. Fundamentals of computers - V.Rajaraman - Prentice- Hall of india
2. Microsoft Office 2007 Bible - John Walkenbach,Herb Tyson,Faithe Wempen,cary N.Prague,Michael R.groh,Peter G.Aitken, and Lisa a.Bucki -Wiley India pvt.ltd.
3. Computer Fundamentals - P. K. Sinha Publisher: BPB Publications.
4. Computer & Internet Basics Step-by-Step - Etc-end the Clutter - Infinity Publishing.
5. <https://en.wikipedia.org>
6. <http://windows.microsoft.com/en-in/windows/windows-basics-all-topics>



KUVEMPU UNIVERSITY

DEPARTMENT OF SOCIOLOGY

**REVISED SYLLABUS FOR THE BACHELOR OF ARTS
UNDER GRADUATE**

**WITH EFFECT FROM THE ACADEMIC YEAR 2018-19
ONWARDS**

KUVEMPU UNIVESITY

UG SOCIOLOGY SYLLABUS

Semester	Title of the Papers	Teaching Hours
I	Paper I - INTRODUCTION TO SOCIOLOGY	90 (06 hours per week)
II	Paper II - STUDY OF INDIAN SOCIETY	90 (06 hours per week)
III	Paper III - RURAL SOCIOLOGY	90 (06 hours per week)
IV	Paper IV - RESEARCH METHODOLOGY	90 (06 hours per week)
V	Paper V - FOUNDATIONS OF SOCIOLOGICAL THOUGHT (Compulsory Paper)	80 (05 hours per week)
	Paper VI - POPULATION STUDIES (Optional Paper)	80 (05 hours per week)
	Paper VI - MEDICAL SOCIOLOGY (Optional Paper)	80 (05 hours per week)
VI	Paper VII - URBAN SOCIOLOGY (Compulsory Paper)	80 (05 hours per week)
	Paper VIII - CURRENT SOCIAL PROBLEMS OF INDIA (Optional Paper)	80 (05 hours per week)
	Paper VIII - INDUSTRIAL SOCIOLOGY (Optional Paper)	80 (05 hours per week)

MODEL QUESTION PAPER PATTERN FOR B.A. SOCIOLOGY

- Maximum Marks:80 per Subject
- Examination Duration: 03 Hours
- Each Question paper is divided into three Sections. Viz A, B and C.

SECTION- A

- Short answer Questions
- Answer any four out of Six – $04 \times 05 = 20$ Marks

SECTION –B

- Medium answer Questions
- Answer any three out of five- $03 \times 10 = 30$ Marks

SECTION – C

- Long answer Questions
- Answer any two out of three- $02 \times 15 = 30$ Marks

Note: The award of Internal Assessment (IA) is based on the performance in one internal test and one skill development activity related to prescribe syllabus. (Weightage: 10 Marks for One Internal Test + 10 Marks for One Skill Development Activity = 20 Marks)

I Year BA Semester-I

Paper-I: INTRODUCTION TO SOCIOLOGY

Unit-I: Introduction

The Meaning and Definition of Sociology. Nature, Scope and importance.
Development of Sociology in India.

Unit-II: Basic Sociological Concepts

Meaning, Definition and Characteristics of (A) Community (B) Institution
(C) Social Structure (D) Role and Status.

Unit- III: Heredity and Environment

A) Heredity- Meaning, Mechanism and the Role of Genes.
B) Environment- Meaning, Types and Influence of Environment on Personality

Unit-IV: Socialization and Culture

A) Socialization- Meaning and Definition, Agencies of Socialization - Family, Education Peer Group, Mass Media. Importance of Socialization. Theory of Looking glass self.
B) Culture- Meaning and Definition. Characteristics and Recent Trends.

Unit-V: Social Control:

Meaning, Definition and Importance of Social Control.
Types –Formal (law and education), Informal (folkways and mores)

Unit-VI: Social Change:

Meaning, Definition and Characteristics. Factors of Social Change-Physical, Biological, Cultural and Technological.

Reference Books

1. Gisbert - Fundamentals of sociology. Ed. 3rd, Pub. Orient Black Swan Publication 1973
2. Harry M Johnson- Sociology – A Systematic Introduction. First published in 1998.
Routledge is an imprint of Taylor & Francis, an informa company.
3. Jayaram, N- Introduction to sociology, Rawat Publications, 2015
4. Kingslay Devis - Human society. 4th edition pub. Macmillan Company, 1952
5. Shankar Rao, C.N - Sociology. Edition Reprint, S. Chand Limited, 1990

I Year BA SEMESTER-II
PAPER-II: STUDY OF INDIAN SOCIETY

Unit- 1 Indian culture

Characteristics - Spiritual basis, Universal Outlook, Spirit of Inquiry, Unity in Diversity, Integral Approach, Harmony with Nature, Tolerance, Respect of Women hood.

Unit-II: Caste System:

Meaning, Definition, Positive and Negative aspects of Caste System. Caste and politics.

Unit-III: Hindu Marriage and Family:

- a) Objectives of Hindu Marriage, Recent trends and legislation (Hindu Marriage Act, Special Marriage Act and Dowry prohibition Act)
- b) Family: i) Joint family- Meaning, Definition, Merits and Demerits.
ii) Nuclear Family- Meaning, Definition and Functions.

Unit-IV: Status of Indian Women

- a) Status of Hindu Women through the Ages
- b) Status of Christian Women
- c) Status of Muslim Women

Unit V: Social Stratification

Meaning, Definition and Characteristics

Unit-VI: Backward Class and Minority

- a) Tribal of India- Meaning, Definition and Problems of Tribals.
- b) Schedule Caste- Meaning, Problems of SCs. Protection of Civil Rights Act.
- c) Backward Class Movement with special reference to Karnataka
- d) Religious Minorities- Problems of Muslims and Christians.

Reference Books

- 1) Ghurye, G.S - Caste and race in India. Pub. Popular Prakashana Bombay.
- 2) Kapadia KM - Marriage and Family in India, Ed.3, Oxford University Press, 1972
- 3) Prabhu, P.H - Hindu Social Organization. (I.S.I. Publications, New Delhi: Sterling Publishers (P) Ltd., 1972),
- 4) Ram Ahuja - Indian Social System. Ed. Reprint, Rawat Publ., 2006
- 5) Ramachandra Rao S. K- Social Institutions among the Hindus. Wesley Press, Mysore, the printers of this book- Bangalore
- 6) Srinivas, M.N. - Caste in Modern India and other Essays. Media Promoters & Publishers, 1989

II Year BA SEMESTER –III
PAPER – III: RURAL SOCIOLOGY

Unit – I: Introduction

Meaning, Definitions, Scope and Importance of Rural Sociology. Historical Development of Rural Sociology with special reference to India. Characteristics of Rural Community. Villages in India: Types, Changes in Rural Society.

Unit-II: Rural Problems:

Problems and Remedies of (1) Agriculture (2) Cottage Industries (3) Child and Women Labour (4) Health and sanitation (5) Farmer's Suicide.

Unit III: Globalization and Rural Change

Meaning, Definition, Characteristics and Impacts of Globalization on Rural Change.

Unit –IV: Rural Political Structure

Panchayat Raj -Objectives, Structure and Functions with special reference to Karnataka. Role of Women in Panchayat, Crisis in Rural Politics.

Unit-V: Rural Development

(1) Role of NGO's in Rural Development (2) Self Help Groups
(3) SEZ (Special Economic Zone):- Positive and Negative Aspects (4) Rural Leadership

Reference Books

- 1) Boden, Powell - The Indian Village Community, the University of California, Longmans, Green, and Company, 1896
- 2) Desai, A. R. - Rural Sociology in India , Pub. Popular Prakashan
- 3) Chidambaram Introduction to Rural Sociology –, John Wiley & Sons Canada, Limited, 1977
- 4) Dube, S.C. - Indian Villages, First published in 1998. Rutledge is an imprint of Taylor & Francis, an informa company.
- 4) Gurumurthy , U - Panchayath Raj and the Weaker Sections, New Delhi, Ashish Publishing House, 1987, xiii, 211 p.
- 5) Jain, S. C., Community Development and Panchayati Raj in India, Allied Publishers, Bombay, 1967. Jayaswal, K. P., Hindu Polity, The Bangalore Printing and Publishing Company, Bangalore, 1967.
- 6) Madan, G.R. - The Indian Rural Problems, Allied Publishers
- 7) Nanavathi, M.B and Anjaria, J. J - The Indian Rural Problems, Pub. (the Indian Journal of Statistics), Calcutta, Vol. 7, Part 3, 1946.

II Year BA SEMESTER – IV

PAPER –IV: RESEARCH METHODOLOGY

Unit –I: Social Research

Meaning, Definitions, Types and Qualities of Social Researcher. Research Design (Meaning and Uses). Stages of Social research. Uses and Limitations of Social Research.

Unit-II: Social Survey

Meaning, Definitions, Types, Advantages and Limitations.

Unit – III: Sampling

Meaning, Definitions, Types, Advantages and Limitations.

Unit-IV: Observation

Meaning, Definitions, Types, Advantages and Limitations.

Unit - V: Questionnaire

Meaning, Definitions, Types. Schedule- Meaning and Characteristics. Construction of Mailed Questionnaire, Uses and Limitations.

Unit – VI: Interview

Meaning, Definitions, Types, Advantages and Limitations.

Unit-VII: Report Writing

Interpretation of Data- Classifications, Editing, Coding and Tabulation.
Report Writing- Meaning, Contents of Report.

Reference Books

- 1) Ahuja, Ram - Research Methods, Reprint, Rawat Publications, 2001
- 2) Goode and Hatt - Methods in Social Research, Surjeet Publication, 2006
- 3) Gopal, M.H - Introduction to Research Procedure in Social Science, Asia Publishing House, 1964
- 4) Clause Adolf Moser - Survey Methods in Investigation, Ed. 2, reprint, Pub. Gower, 1979
Cornell, University 12 Jan 2009
- 5) Raj, Hans - Theory and Practice in Social Research, Pub. Surjeet Publications, 1979
- 6) Sharma, BAV., Prasad ,Ravindra., Sathyanarayana, P - Research Methods in Social Science (New Delhi : Sterling, 1985),
- 7) Wilkinson and Bandarkar - Methodology and Techniques of Social Research. Ed.9
Himalaya Publishing House, 1999
- 8) Young, P.V- Scientific Methods in Social Survey and Research, Editor Herbert Blumer,
Literary Licensing, LLC, 2012

III Year BA SEMESTER -V

PAPER-V: FOUNDATIONS OF SOCIOLOGICAL THOUGHT (Compulsory Paper)

Unit –I: Development of Sociological Thought

Meaning, Definition and Importance. Stages of Social thought.

Unit – II: Auguste Comte: Brief Life History and his contributions - (a) Law of Three Stages

(b) Hierarchy of Sciences (c) Religion of Humanity.

Unit-III: Herbert Spencer: Brief Life History and his contributions - (a) The law of Evolution

(b) The organic Analogy.

Unit-IV: Emile Durkheim: Brief Life History and his contributions:- (a) Division of Labor
(b) Typology of Suicide.

Unit –V: Max Weber: Brief Life History and his contributions - (a) Bureaucracy
(b) Social Action.

Unit – VI: Karl Marx: Brief Life History and his contributions - Class Struggle.

Unit-VII: Indian Sociologist

- a) A.R. Desai – Brief Life history and his contributions on Rural Society
- b) M.N. Srinivas- Brief Life history and his contributions on - (a) Social Mobility
(b) Dominant Caste.
- c) Iravati Karve – Brief Life history and her contributions on Kinship Organization in India.

Reference Books

- 1) Raymond Aron - Main Currents in Sociological Thought. Transaction Publishers, 1998
- 2) Emory Stephen Bogardus - The Development of Social Thought, Longmans, Green, 1947
- 3) Chambliss, Rollin - Social Thought, Pub.Fb&c Limited, 30-Sep-2016
- 4) Collin. R and Makowsky M.-The Discovery of Society, Pub. McGraw-Hill, 2010
- 5) Lewis A Coser- Masters of Sociological Thought: Ideas in Historical and Social Context, Pub, Waveland Press, 2003
- 6) Nishet R - The Sociological Tradition. Ed.Reprint, revised, Pub Transaction Publishers, 1993

III Year BA SEMESTER – V

PAPER –VI: POPULATION STUDIES (Optional Paper)

Unit –I: Meaning and Definitions of Population Studies:

Development of Population Studies in general. Development of Population Studies in India and Importance of its Study.

Unit-II: Source of Population:

- 1) Census: Meaning and Importance of Census, Procedure and Problems of Census Taking.
- 2) Civil Registration System: Meaning and Importance.

Unit –III: Population Theories:

- a) Malthusian theory of Population with critical evaluation.
- b) Optimum population theory with critical evaluation.
- c) Demographic transition theory with critical evaluation.

Unit-IV: Compositional Characteristics of Population:

Age and Sex -Meaning and Importance. Dependency Ratio, Population Pyramid, Ageing of Population.

Unit-V: Demographic Process:

Fertility- Birth Process. Influencing Factors:- Socio- Cultural and Physiological Factors.

Mortality – Meaning and causes of Mortality.

Infant and Maternal Mortality - Meaning and Causes.

Migration – Meaning, Types, and Determinants of Migration.

Unit –VI: Population in India:

- a) Causes and Effects of Over Population.
- b) Family Planning: Meaning, Objectives, Methods, Success and Failure.
- c) Population Education: Objectives and Importance.
- d) Family Welfare Program: Meaning and Objectives.

Reference Books

1. Agarwal, S.N. - Some Problems of India's Population, Publisher Vora, 1966, the University of Michigan.
2. Bhende , Asha and Kanitkar, Tara - Principles of Population Studies, Himalaya Publishing House, 1994
3. Cox, Peter R. Demography. Cambridge University Press, 1955. Pp. 11–67. Eldridge,
4. Andrew G. Onokerhoraye- Population Studies, A.G. Onokerhoraye, 1985, Indiana University.
5. Kuppu Swamy : Population and Society in India, Popular Prakashan Private Ltd., 1975,
6. Thomson and Lewis - Population Problems,5th edition, Publisher, McGraw-Hill, 1970

III Year BA SEMESTER – V

PAPER –VI: MEDICAL SOCIOLOGY (Optional Paper)

Unit I: Medical Sociology

- a. Health: Goals and Definitions
- b. Related Terms/; Sociology of Health and Sociology of Disease
- c. Difference between Sociology of Medicine and Sociology in Medicine

Unit II: Constructing Illness

- a. Definitions of Illness, Sick and Disease
- b. Sick Role- Role of Nurses and other Paramedics
- c. Stigma of Mental Illness and HIV Positive

Unit III: Socio-Cultural Determinants of Health

Family, Gender, Housing, Sanitation, Environment, Nutrition and Cultural Practices.

Unit IV: Healthcare and Systems

- a. Hospital as a Social Institution
- b. Role of Pharmaceutical Industry and Advertisements
- c. Introduction of Healthcare Systems- Folk Medicine/ Ethnomedicine, Ayurveda, Unani, Siddha, Yoga, Homeopathy and Allopathy

Unit V: Healthcare Delivery in India

- a. Health Policies, Mental Health Policies
- b. Overview of Health Programmes related to Women, Children and the Disabled

Reference Books

1. Albert, Gary L. and R. Fitzpatrick (1994). Quality of Life In Healthcare: Advances in Medical Sociology, Mumbai: Jai Press.
2. Annandale Allen (2001). The Sociology of Health and Medicine- A Critical Introduction, Cambridge: Polity Press.
3. Bloom, Samuel W. (1963). The Doctor and His Patient, New York: Free Press.
4. Chloe Bird, Peter Conrad and Alan Fremont eds. (2000). Handbook of Medical Sociology, New York: Prentice Hall.
5. Cocker ham, William C. (1997). Medical Sociology, New Jersey, Prentice Hall.
6. Coe, Rodney M, (1970). Sociology of Medicine, New York: McGraw Hill.
7. Conrad, Peter ed. (2005). Sociology of Health and Illness: Critical perspectives, New York: Worth Publishing.
8. Dutta, P.R. (1955). Rural Health and Medical Care in India, Amble: Army Education Press.
9. Schwartz, Howard (1994). Dominant Issues in Medical Sociology, New York: McGraw Hill.
10. Venkataratnam, R (1979). Medical Sociology in an Indian Setting, Madras:

III Year BA SEMESTER – VI

PAPER-VII: URBAN SOCIOLOGY (Compulsory Paper)

Unit-I: Urban Sociology and Urban Community

- a) Urban Sociology – Introduction, Definition, Scope and Importance.
- b) Urban Community-Characteristics, Distinction between Rural-Urban Communities.

Unit-II: Urbanism and Urbanization

- a) Urbanism-Meaning and Definition.
- b) Urbanization-Meaning and Definition. Factors responsible for Urbanization.
Urbanization in India. Theories of Urbanization- (i) Concentric zone circle theory
(ii) Sector theory.

Unit-III: Industrialization and Work

- a) Industrialization-Meaning, Industrialization and Social Change, Effects of Industrialization
- b) Work- Social Importance of work

Unit-IV: Urban Problems

Causes, Effects and Remedies of:

- a) Housing Problem
- b) Slum Problem
- c) Problems of Sex Workers (Prostitution)
- d) Drug Addiction

Unit-V: Urban Planning and Development

- a) Urban Planning-Meaning, Objectives, Problems of Urban Planning in India.
- b) Urban Development – Meaning, Objectives and Agencies of Urban Development.

Reference Books

1. Ahuja, Ram- Social problem in India Rawat Publications; 3rd Revised & Updated edition (2014)
2. Slums and urbanization. /Edited by A. R. Desai and S. Devadas Pillai. Bombay : Popular Prakashan, [1970]
3. Burgess Ernest - Urban Sociology ,University of Chicago Press; Abridged edition (June 1, 1967)
4. Madan, G.R - Indian Social Problems (Vol-1): Social Disorganization and Reconstruction Volume 1 of Seventh edition, Allied Publishers, 1966
5. Rao, M. S. A. - Urban Sociology in India. Orient Longman, 1992

III Year BA SEMESTER – VI

PAPER-VIII: CURRENT SOCIAL PROBLEMS OF INDIA (Optional Paper)

Unit- I: Structural Problem

- a) Casteism: Meaning, Definitions, Causes, Effects and Remedies.
- b) Communalism: Meaning Definitions, Causes, Effects and Remedies (Social and legal).

Unit-II: Familial problems

- a) Problems of Aged: Meaning, Definitions, Causes, Effects and Remedies.
- b) Gender Discrimination: Meaning, Definitions, Causes, Effects and Remedies.
- c) Domestic problems:
 1. Dowry- Act of 1961 and 1986.
 2. Divorce – Meaning and Definition. Divorcee as Social Evil. Causes and Remedies

Unit-III: Developmental problems

- (a) Regional Disparities: Meaning, Definitions, Causes, Effects, Remedies and Legislations (Article – 371(J)).
- (b) Globalization: Meaning, Definitions, Causes and Effects-positive and Negative Impacts.

Unit-IV: Organizational problems:

- a) Terrorism: Meaning, Definitions, Causes, Effects Remedies and Legislations.
- b) Corruption: Meaning, Definitions, Causes, Effects and Remedies. The role of Lokayukta and CBI.
- c) Youth Unrest: Meaning, Definition, Causes, Effects and Remedies.
- d) Juvenile Delinquency: Meaning, Definition, Types, Causes, Effects and Remedies (Social and Legal).

Reference Books

1. Ahuja, Ram- Social problem in India Rawat Publications; 3rd Revised & Updated edition (2014)
2. ATTAR, A D: Juvenile delinquency: A comparative study. (Popular Prakashan, Bombay, 1964)
3. Gerald Berreman. "Social Inequality: A Cross-Cultural Analysis" in Social Inequality: Comparative and Developmental Approaches, pp. 3–40. Ed. New York: Academic Press.
4. Ghurye, G.S Social Tensions in India. Bombay: Popular Prakashan, 1968. xi + 552 pp., index. Rs. 72 (cloth).

III Year BA SEMESTER – VI

PAPER-VIII: INDUSTRIAL SOCIOLOGY (Optional Paper)

Unit I: Industrial Sociology

- a. Nature and Scope of Industrial Sociology
- b. Definition- Industry- Sociological Approach
- c. Rise and Development of Industry
- d. Rise of Industrial Sociology

Unit II: Dimensions of Work

- a. The Concept of Work- Work as a Universal Activity
- b. Monotony-Fatigue-Alienation-Gender-Unpaid Work and Forced Labour

Unit III: Forms of Industrial Culture and Organization

Industrialism, Post-Industrial Society, Information Society

Unit IV: Problems in Industry

Industrial Sickness- Industrial Disputes- Absenteeism- Management and Labour Relationship.

Labour Organization: Nature and Functions, Collective Bargaining and its Features, Risk- Hazards and Disaster

Unit V: Labour Legislation

- a. Post 1990's Labour Laws in India
- b. Labour Welfare: Changing Policy Orientations (Pre 1990's and Post 1990 decades)
- c. International Labour Organization

Reference Books

1. Agarwal, R.D. (1974) Dynamics of Labour Relations in India. New Delhi, Tata McGraw Hill Publishing Company.
2. Baldev Sharma, R (1974) The Indian Industrial Worker. Bombay, Vikas Publishing House.
3. Giri, V.V. (1972) Labour Problems in Indian Industry. Bombay, India Asia Publishing House.
4. Gisbert Pascal (1972) Fundamental of Industrial Sociology. Bombay, Tata McGraw Hill.
5. Jain, S.C. (1971) The India Manager, Somalia Publication.
6. Miller, D.C. and Form, W.H. (1964) Industrial Sociology. New York, Harper and Row.
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NEP-2020

CURRICULUM STRUCTURE AND SYLLABUS

**Bachelor of Computer Applications (Basic and Honors) Programmes
as Major and Minor Courses**

**And
Open Elective courses in Computer Applications**

UG BOS IN COMPUTER SCIENCE

w.e.f Academic Year 2022-23 onwards

The objectives of the BCA Program

1. The primary objective of this program is to provide a foundation of computing principles and business practices for effectively using/managing information systems and enterprise software
2. It helps students analyze the requirements for system development and exposes students to business software and information systems
3. This course provides students with options to specialize in legacy application software, system software or mobile applications
4. To produce outstanding IT professionals who can apply the theoretical knowledge into practice in the real world and develop standalone live projects themselves
5. To provide opportunity for the study of modern methods of information processing and its applications.
6. To develop among students the programming techniques and the problem-solving skills through programming
7. To prepare students who wish to go on to further studies in computer science and related subjects.
8. To acquaint students to Work effectively with a range of current, standard, Office Productivity software applications

Program Outcomes: BCA (3 Years) Degree

1. Discipline knowledge: Acquiring knowledge on basics of Computer Science and ability to apply to design principles in the development of solutions for problems of varying complexity
2. Problem Solving: Improved reasoning with strong mathematical ability to Identify, formulate and analyze problems related to computer science and exhibiting a sound knowledge on data structures and algorithms.
3. Design and Development of Solutions: Ability to design and development of algorithmic solutions to real world problems and acquiring a minimum knowledge on statistics and optimization problems. Establishing excellent skills in applying various design strategies for solving complex problems.
4. Programming a computer: Exhibiting strong skills required to program a computer for various issues and problems of day-to-day applications with thorough knowledge on programming languages of various levels.
5. Application Systems Knowledge: Possessing a sound knowledge on computer application software and ability to design and develop app for applicative problems.
6. Modern Tool Usage: Identify, select and use a modern scientific and IT tool or technique for modeling, prediction, data analysis and solving problems in the area of Computer Science and making them mobile based application software.
7. Communication: Must have a reasonably good communication knowledge both in oral and writing.
8. Project Management: Practicing of existing projects and becoming independent to launch own project by identifying a gap in solutions.
9. Ethics on Profession, Environment and Society: Exhibiting professional ethics to maintain the integrality in a working environment and also have concern on societal impacts due to computer-based solutions for problems.
10. Lifelong Learning: Should become an independent learner. So, learn to learn ability.
11. Motivation to take up Higher Studies: Inspiration to continue educations towards advanced studies on Computer Science.

Additional Program Outcomes: BCA Degree (Hons)

The Bachelor of Computer Application (BCA (Hons)) program enables students to attain following additional attributes besides the afore-mentioned attributes, by the time of graduation:

1. Apply standard Software Engineering practices and strategies in real -time software project development
2. Design and develop computer programs/computer -based systems in the areas related to AI, algorithms, networking, web design, cloud computing, IoT and data analytics.
3. Acquaint with the contemporary trends in industrial/research settings and thereby innovate novel solutions to existing problems
4. The ability to apply the knowledge and understanding noted above to the analysis of a given information handling problem.
5. The ability to work independently on a substantial software project and as an effective team member.

Curriculum for BCA

Sem	Core Courses	Hour / Week		DS Elective Courses	Hous/ Week
		Theory	Lab		
1	i. Fundamentals of Computers ii. Programming in C iii. Mathematical Foundation iv. LAB: Information Technology v. LAB: C Programming	3 3 3	4 4		
2	i. Discrete Mathematical Structures ii. Data Structures using C iii. Object Oriented Concepts using JAVA iv. LAB: Data Structure v. LAB: JAVA Lab	3 3 3	4 4		
3	i. Data Base Management Systems ii. C# and DOT NET Framework iii. Computer Communication and Networks iv. LAB: DBMS v. LAB: C# and DOT NET Framework	3 3 3	4 4		
4	i. Python Programming ii. Computer Multimedia and Animation iii. Operating Systems Concepts iv. LAB: Multimedia and Animation v. LAB: Python programming	3 3 3	4 4		
5	i. Internet Technologies ii. Statistical Computing and R Programming iii. Software Engineering iv. LAB: R Programming v. LAB: JAVA Script, HTML and CSS vi. Vocational 1	3 3 3	4 4	(a) Cyber Law and CyberSecurity (b) Cloud Computing (c) Business Intelligence	3 3 3
6	i. Artificial Intelligence and Applications ii. PHP and MySQL iii. LAB: PHP and MySQL iv. PROJECT: v. Vocational 2	3 3 3	4 12	(a) Fundamentals of DataScience (b) Mobile Application Development (c) Embedded Systems	3 3 3
7	i. Analysis and Design of Algorithms ii. Data Mining and KnowledgeManagement iii. LAB: Algorithms iv. LAB: Data Mining and KnowledgeManagement v. Vocational 3	3 3	4 4	(a) Data Compression (b) IoT (c) Data Analytics	3 3 3
8	i. Automata Theory and CompilerDesign ii. Cryptography and Network Security iii. Compiler Lab iv. LAB: Project v. Vocational 4	3 3 3	4 12	(a) Open-Source Programmin g (b) Storage Area Networks (c) Pattern Recognition (a) Machine Learning	3 3 3 3

TABLE I: COURSE STRUCTURE FOR BCA.

Semester	Course Code	Title of the Paper	Credit	Total Credit of OE, Languages, CAE, Voc, AECC, SEC	Total Credit
I	CAC01	Fundamentals of Computers	3	13	26
	CAC02	Programming in C	3		
	CAC03(a)/(b)	Mathematical Foundation	3		
	CAC01P	LAB: Information Technology	2		
	CAC02P	LAB: C Programming	2		
II	CAC04	Data Structures using C	3	13	26
	CAC05	Object Oriented Concepts using JAVA	3		
	CAC06	Discrete Mathematical Structures	3		
	CAC04 P	LAB: Data Structure	2		
	CAC05 P	LAB: JAVA	2		
III	CAC07	Data Base Management Systems	3	13	26
	CAC08	C# and DOT NET Framework	3		
	CAC09	Computer Communication and Networks	3		
	CAC07P	LAB: DBMS	2		
	CAC08P	LAB: C# and DOT NET Framework	2		
IV	CAC10	Python Programming	3	13	26
	CAC11	Computer Multimedia and Animation	3		
	CAC12	Operating System Concepts	3		
	CAC10P	LAB: Python programming	2		
	CAC11P	LAB: Multimedia and Animation	2		
V	CAC13	Internet Technologies	3	10	23
	CAC14	Statistical Computing and R Programming	3		
	CAC15	Software Engineering	3		
	CAC13P	LAB: JAVA Script, HTML and CSS	2		
	CAC14P	LAB: R Programming	2		
VI	CAC16	PHP and MySQL	3	10	23
	CAC17	Artificial Intelligence and Applications	3		
	CAC16P	LAB: PHP and MySQL	2		
	CA-P1	Project Work	5		
VII	CAC18	Analysis and Design of Algorithms	3	11	21
	CAC19	Data Mining and Knowledge Management	3		
	CAC18P	LAB: Algorithms	2		
	CAC19P	LAB: Data Mining	2		
	CAI01	Internship	2		
VIII	CAC20	Automata Theory and Compiler Design	3	6	20
	CAC21	Cryptography and Network Security	3		
	CAC20P	LAB: Compiler Lab	2		
	CAPO2	Project Work	6		

TABLE II: CS COURSE DETAILS FOR BCA

Course-Type	Course Code as referred above	Compulsory/ Elective	List of compulsory courses and list of option of elective courses. (A suggestive list)
CA	CAC01, CAC02, CAC03(a)/(b), CAC04, CAC05, CAC06, CAC07, CAC08, CAC09, CAC10, CAC11, CAC12, CAC13, CAC14, CAC15, CAC16, CAC17, CAC18, CAC19, CAC20, CAC21	Compulsory	As Mentioned in Table I
CA E	CAE-1A	Elective	Cyber Law and Cyber Security OR Business Intelligence OR Fundamentals of Data Science
	CAE-2A	Elective	Fundamentals of Data Science OR Mobile Application Development OR Embedded Systems
	CAE-3A	Elective	Data Compression OR Internet of Things (IoT) OR Data Analytics
	CAE-4A	Elective	Open-source Programming OR Storage Area Networks OR Pattern Recognition OR Machine Learning
Vocational	Vocational -1	Elective	DTP, CAD and Multimedia OR Hardware and Server Maintenance OR Web Content Management Systems OR Computer Networking OR Health Care Technologies OR Digital Marketing OR Office Automation
	Vocational -2	Elective	
	Vocational -3	Elective	
	Vocational -4	Elective	
SEC	SEC 1	Compulsory	Health & Wellness/ Social & Emotional Learning
	SEC 2	Compulsory	Sports/NCC/NSS etc
	SEC 3	Compulsory	Ethics & Self Awareness
	SEC 4	Compulsory	Professional Communication
AECC	AECC1	Compulsory	Environmental Studies
	AECC2	Compulsory	Constitution of India
Language 1	L1-1, L1-2, L1-3, L1-4	Compulsory	Kannada/Functional Kannada
Language 2	L2-1, L2-2, L2-3, L4-4	Elective	English/Hindi/French/ Additional English/ etc.

Computer Application Core Courses (CA C) for BCA (Hons)

Sl. No	Course Code	Title of the Paper
1	CAC01	Fundamentals of Computers
2	CAC02	Programming in C
3	CAC03	Mathematical Foundation
4	CAC04	Discrete Mathematical Structures
5	CAC05	Object Oriented Concepts using JAVA
6	CAC06	Data Structures using C
7	CAC07	Data Base Management Systems
8	CAC08	C# and DOT NET Framework
9	CAC09	Computer Communication and Networks
10	CAC10	Python Programming
11	CAC11	Computer Multimedia and Animation
12	CAC12	Operating System Concepts
13	CAC13	Internet Technologies
14	CAC14	Statistical Computing and R Programming
15	CAC15	Software Engineering
16	CAC16	PHP and MySQL
17	CAC17	Artificial Intelligence and Applications
18	CAC18	Analysis and Design of Algorithms
19	CAC19	Data Mining and Knowledge Management
20	CAC20	Automata Theory and Compiler Design
21	CAC21	Cryptography and Network Security

Computer Application Electives (CA E) for BCA (Hons)

Sl. No	Computer Application Electives (CA E)
1	Business Intelligence
02	Cyber Law and Cyber Security
3	Data Analytics
4	Data Compression
5	Embedded Systems
6	Fundamentals of Data Science
7	Internet of Things (IoT)
8	Machine Learning
9	Mobile Application Development
10	Open-source Programming
11	Pattern Recognition
12	Storage Area Networks

Vocational Electives

Sl. No	Vocational Electives
1	DTP, CAD and Multimedia
2	Hardware and Server Maintenance
3	Web Content Management Systems
4	Computer Networking
5	Health Care Technologies
6	Digital Marketing
7	Office Automation

Open Electives in Computer Science

Sl. No.	Semester	Open Electives
01	FIRST SEMESTER	<u>Any one from the following</u> <ul style="list-style-type: none">• Office Automation• Computer Fundamentals• Problem Solving and C Programming Concepts
02	SECOND SEMESTER	<u>Any one from the following excluding elective chosen in the first semester</u> <ul style="list-style-type: none">• Office Automation• Computer Fundamentals• Problem Solving and C Programming Concepts
03	THIRD SEMESTER	<u>Any one from the following</u> <ul style="list-style-type: none">• Web Designing• E-Commerce
04	FOURTH SEMESTER	<u>Any one from the following excluding elective chosen in the third semester</u> <ul style="list-style-type: none">• Web Designing• E-Commerce

Syllabus for BCA (Basic and Honors)

Semester: I

Course Code: CAC01	Course Title: Fundamentals of Computers
Course Credits: 03	Hours/Week: 03
Total Contact Hours: 42	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 03

Course Outcomes (COs):

- Introduction to computers, classification of computers, anatomy of computer, constituents and architecture, microcontrollers
- Operating systems, functions of operating systems, classification of operating systems, kernel, shell, basics of Unix, shell programming, booting
- Databases, why databases are used, users, SQL, data types in SQL, introduction of queries - select, alter, update, delete, truncate, using where, and or in not in
- Internet basics, features, applications, services, internet service providers, domain name system, browsing, email, searching
- Web Programming basics, introduction of HTML and CSS programming
- Introduction of computers, classification of computers, anatomy of computer, constituents and architecture, microcontrollers.

Course Content

Content	Hours
Unit - 1	
Fundamentals of Computers: Introduction to Computers - Computer Definition, Evolution and History of Computers, Basic Organisation of a Digital Computer; Number Systems – different types, conversion from one number system to another; Computer Codes – BCD, Gray Code, ASCII and Unicode; Boolean Algebra – Boolean Operators with Truth Tables; Types of Software – System Software and Utility Software; Computer Languages - Machine Level, Assembly Level & High Level Languages, Translator Programs – Assembler, Interpreter and Compiler; Planning a Computer Program - Algorithm, Flowchart and Pseudo code with Examples (at least 5 hours of teaching).	10

Unit-2	
Introduction to Computer: Characteristics of computers, Classification of Digital Computer Systems: Microcomputers, Minicomputers, Mainframes, Super computers. Anatomy of Computer: Introduction, Functions & Components of a Computer, Central Processing Unit, Storage units, Input and output Devices. How CPU and memory works. Program execution with illustrative examples. Introduction to microcontrollers.	10
Unit-3	
Operating System Fundamentals: Operating Systems: Introduction, Functions of an operating System, Classification of Operating Systems, System programs, Application programs, Utilities, The Unix Operating System, Basic Unix commands, Microkernel Based Operating System, Booting.	08
Unit-4	
Introduction to Database Management Systems: Database, DBMS, Why Database -File system vs DBMS, Database applications, Database users, Introduction to SQL, Data types, Classification of SQL-DDL with constraints, DML, DCL, TCL	08
Unit-5	
Internet Basics: Introduction, Features of Internet, Internet application, Services of Internet, Logical and physical addresses, Internet Service Providers, Domain Name System. Web Basics: Introduction to web, web browsers, http/https, URL, HTML5, CSS	06

Text Books:

1. Pradeep K. Sinha and Priti Sinha: Computer Fundamentals (Sixth Edition), BPB Publication
2. David Riley and Kenny Hunt, Computational thinking for modern solver, Chapman & Hall/CRC,

Reference:

1. J. Glenn Brook shear," Computer Science: An Overview", Addison-Wesley, Twelfth Edition,
2. R.G. Dromey, "How to solve it by Computer", PHI,

Course Code: CAC01P	Course Title: Information Technology Lab
Course Credits: 02	Hours/Week: 04
Total Contact Hours: 52	Formative Assessment Marks: 10
Exam Marks: 40	Exam Duration: 04

Part A:

1. Activities using Word Processor Software
2. Activities using Spreadsheets Software
3. Activities using Presentation Software
4. Activities involving Multimedia Editing (Images, Video, Audio ...)
5. Tasks involving Internet Browsing

Part B:

1. Flow charts: Installation and using of flowgarithms software for different arithmetic tasks like sum, average, product, difference, quotient and remainder of given numbers, calculate area of Shapes (Square, Rectangle, Circle and Triangle), decision making and looping, arrays and recursion (at least 10 problems covering all concepts).

NOTE: In addition to the ones listed above, colleges can include other activities so as for the student to become proficient in using personal computers for multiple purposes for which modern computers can be put to use.

Reference:

1. Computational Thinking for the Modern Problem Solver, By Riley DD, Hunt K.A CRC press, 2014
2. Ferragina P, Luccio F. Computational Thinking: First Algorithms, Then Code. Springer

Web References:

<http://www.flowgorithm.org/documentation/>

Evaluation Scheme for Lab Examination

Assessment Criteria		Marks
Program -1 from Part A	Write up of the program -1	5
Program -2 from Part B	Write up of the program -2	5
Execution and formatting (Any one program)		10
Viva Voce based on Lab Activities		05
Total		25

Course Code: CAC02	Course Title: Programming in C
Course Credits: 03	Hours/Week: 03
Total Contact Hours: 42	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 03

Course Outcomes (COs):

After completing this course satisfactorily, a student will be able to:

- Confidently operate Desktop Computers to carry out computational tasks
- Understand working of Hardware and Software and the importance of operating systems
- Understand programming languages, number systems, peripheral devices, networking, multimedia and internet concepts
- Read, understand and trace the execution of programs written in C language
- Write the C code for a given problem
- Perform input and output operations using programs in C
- Write programs that perform operations on arrays

Course Content

Content	Hours
Unit - 1	
Introduction to C Programming: Overview of C; History and Features of C; Structure of a C Program with Examples; Creating and Executing a C Program; Compilation process in C. C Programming Basic Concepts: C Character Set; C tokens - keywords, identifiers, constants, and variables; Data types; Declaration & initialization of variables; Symbolic constants.	5
Unit-2	
Input and output with C: Formatted I/O functions - <i>printf</i> and <i>scanf</i> , control strings and escape sequences, output specifications with <i>printf</i> functions; Unformatted I/O functions to read and display single character and a string - <i>getchar</i> , <i>putchar</i> , <i>gets</i> and <i>puts</i> functions.	4
Unit-3	
C Operators & Expressions: Arithmetic operators; Relational operators; Logical operators; Assignment operators; Increment & Decrement operators; Bitwise operators; Conditional operator; Special operators; Operator Precedence and Associativity; Evaluation of arithmetic expressions; Type conversion.	11

Control Structures: Decision making Statements - <i>Simple if, if_else, nested if_else, else_if ladder, Switch Case, goto, break & continue</i> statements; Looping Statements - Entry controlled and exit controlled statements, <i>while, do-while, for</i> loops, Nested loops.	
Unit - 4	
Arrays: One Dimensional arrays - Declaration, Initialization and Memory representation; Two Dimensional arrays - Declaration, Initialization and Memory representation. Pointers in C: Understanding pointers - Declaring and initializing pointers, accessing address and value of variables using pointers; Pointers and Arrays; Pointer Arithmetic; Advantages and disadvantages of using pointers;	12
Unit-5	
User Defined Functions: Need for user defined functions; Format of C user defined functions; Components of user defined functions - return type, name, parameter list, function body, return statement and function call; Categories of user defined functions - With and without parameters and return type. User defined data types: Structures - Structure Definition, Advantages of Structure, declaring structure variables, accessing structure members, Structure members initialization, comparing structure variables, Array of Structures; Unions - Union definition; difference between Structures and Unions.	10

Text Books:

1. C: The Complete Reference, By Herbert Schildt.
2. M.T Somashekara, D.S Guru and K.S. Manjunatha: Problem solving with C, PHI publication
3. C Programming Language, By Brain W. Kernighan
4. Kernighan & Ritchie: The C Programming Language (PHI)

Reference Books:

1. P. K. Sinha & Priti Sinha: Computer Fundamentals (BPB)
2. E. Balaguruswamy: Programming in ANSI C (TMH)
3. Kamthane: Programming with ANSI and TURBO C (Pearson Education)
4. V. Rajaraman: Programming in C (PHI – EEE)
5. S. Byron Gottfried: Programming with C (TMH)
6. Yashwant Kanitkar: Let us C
7. P.B. Kottur: Programming in C (Sapna Book House).

Course Code: CAC02P	Course Title: C Programming Lab
Course Credits: 02	Hours/Week: 04
Total Contact Hours: 52	Formative Assessment Marks:10
Exam Marks: 40	Exam Duration: 04

Part A:

1. Write a C Program to read radius and find area and volume of a sphere.
2. Write a C Program to read three numbers and find the biggest of three
3. Write a C Program to demonstrate library functions in *math.h* (at least 5)
4. Write a C Program to read a number, find the sum of the digits, reverse the number and check it for palindrome
5. Write a C Program to read numbers from keyboard continuously till the user presses 999 and to find the sum of only positive numbers
6. Write a C Program to read percentage of marks and to display appropriate grade (using switch case)
7. Write a C Program to find the roots of quadratic equation (if else ladder)
8. Write a C program to read marks scored in 3 subjects by n students and find the average of marks and result (Demonstration of single dimensional array)
9. Write a C Program to remove Duplicate Element in a single dimensional Array
10. Program to perform addition and subtraction of Matrices

Part B:

1. Write a C Program to find the length of a string without using built in function
2. Write a C Program to demonstrate string functions (at least 3).
3. Write a C Program to demonstrate pointers in C
4. Write a C Program to generate n prime number by defining *isprime ()* function
5. Write a C Program to find the trace of a square matrix using function
6. Write a C Program to read, display and multiply two matrices using functions
7. Write a C Program to read a string and to find the number of alphabets, digits, vowels, consonants, spaces and special characters.
8. Write a C Program to Reverse a String using Pointer
9. Write a C Program to demonstrate student structure to read & display records of n students.
10. Write a C Program to demonstrate the difference between structure & union.

Evaluation Scheme for Lab Examination

Assessment Criteria		Marks
Program -1 from Part A	Write up of the program -1	5
Program -2 from Part B	Write up of the program -2	5
Execution and formatting (Any one program)		10
Viva Voce based on Lab Activities		05
Total		25

Course Code: CAC03	Course Title: Mathematical Foundation
Course Credits: 03	Hours/Week: 03
Total Contact Hours: 42	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 03

Course Outcomes (COs):

- Study and solve problems related to connectives, predicates and quantifiers under different situations.
- Develop basic knowledge of matrices and to solve equations using Cramer's rule.
- Know the concept of Eigen values.
- To develop the knowledge about derivatives and know various applications of differentiation.
- Understand the basic concepts of Mathematical reasoning, set and functions

Content	Hours
Unit - 1	
Mathematical logic: Mathematical logic introduction-statements Connectives-negation, conjunction, disjunction- statement formulas and truth tables-conditional and bi Conditional statements- tautology contradiction-equivalence of formulas-duality law-Predicates and Quantifiers, Arguments.	10
Unit - 2	
sets and Functions: power set- Venn diagram Cartesian product-relations - functions- types of functions - composition of functions.	10
Unit - 3	
Matrices and determinant: Introduction-Types of matrices-matrix operations-transpose of a matrix -determinant of matrix - inverse of a matrix-Cramer's rule	10
Unit - 4	
Matrix algebra: finding rank of a matrix – normal form-echelon form Cayley Hamilton theorem-Eigen values.	06
Unit -5	
Differential calculus: Functions and limits - Simple Differentiation of Algebraic Functions – Evaluation of First and Second Order Derivatives – Maxima and Minima	06

Text Books:

P. R. Vittal-Business Mathematics and Statistics, Margham Publications, Chennai,

Reference Books:

B. S. Vatsa-Discrete Mathematics –New Age International Limited Publishers, NewDelhi

Semester: II

Course Code: CAC04	Course Title: Data Structures using C
Course Credits: 03	Hours/Week: 03
Total Contact Hours: 42	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 03 Hours

Course Outcomes (COs):

After completing this course satisfactorily, a student will be able to:

- Describe how arrays, records, linked structures, stacks, queues, trees, and graphs are represented in memory and used by algorithms
- Describe common applications for arrays, records, linked structures, stacks, queues, trees, and graphs
- Write programs that use arrays, records, linked structures, stacks, queues, trees, and graphs
- Demonstrate different methods for traversing trees
- Compare alternative implementations of data structures with respect to performance
- Describe the concept of recursion, give examples of its use
- Discuss the computational efficiency of the principal algorithms for sorting, searching, and hashing

Content	Hours
Unit - 1	
Introduction to data structures: Definition; Types of data structures - Primitive & Non-primitive, Linear and Non-linear; Operations on data structures. Algorithm Specification, Performance Analysis, Performance Measurement Recursion: Definition; Types of recursions; Recursion Examples - Fibonacci numbers, GCD, Binomial coefficient nCr , Towers of Hanoi; Comparison between iterative and recursive functions.	08
Unit - 2	
Arrays: Basic Concepts – Definition, Declaration, Initialization, Operations on arrays; Types of arrays; Arrays as abstract data types (ADT); Representation of Linear Arrays in memory; Traversing linear arrays; Inserting and deleting elements; Sorting – Selection sort, Bubble sort, Quick sort, Insertion sort, merge sort; Searching - Sequential Search, Binary search; Iterative and Recursive searching; Multidimensional arrays; Representation of multidimensional arrays; Sparse matrices.	12

Unit - 3	
Stacks: Basic Concepts – Definition and Representation of stacks; Operations on stacks; Applications of stacks; Infix, postfix and prefix notations; Conversion from infix to postfix using stack; Evaluation of postfix expression using stack; Application of stack in function calls. Queues: Basic Concepts – Definition and Representation of queues; Types of queues – Simple queues, Circular queues, Double ended queues, Priority queues; Operations on Simple queues;	10
Unit-4	
Dynamic memory allocation: Static & Dynamic memory allocation; Memory allocation and de- allocation functions - malloc, calloc, realloc and free. Linked list: Basic Concepts – Definition and Representation of linked list, Types of linked lists - Singly linked list, Doubly linked list, Header linked list, Circular linked list; Representation of Linked list in Memory; Operations on Singly linked lists – Traversing, Searching, Insertion, Deletion; Memory allocation; Garbage collection.	12
Unit-5	
Trees: Definition; Tree terminologies –node, root node, parent node, ancestors of a node, siblings, terminal & non-terminal nodes, degree of a node, level, edge, path, depth; Binary tree: Type of binary trees - strict binary tree, complete binary tree, binary search tree and heap tree; Array representation of binary tree. Traversal of binary tree; preorder, inorder and postorder traversal; Reconstruction of a binary tree when any two of the traversals are given.	10

Text Books

1. Ellis Horowitz and Sartaj Sahni: Fundamentals of Data Structures

References

1. Tanenbaum: Data structures using C (Pearson Education)
2. Kamathane: Introduction to Data structures (Pearson Education)
3. Y. Kanitkar: Data Structures Using C (BPB)
4. Kottur: Data Structure Using C
5. Padma Reddy: Data Structure Using C
6. Sudipa Mukherjee: Data Structures using C – 1000 Problems and Solutions (McGraw Hill Education, 2007)

Course Code: CAC04P	Course Title: Data Structure Lab
Course Credits: 02	Hours/Week: 04
Total Contact Hours: 52	Formative Assessment Marks: 25
Exam Marks: 25	Exam Duration: 03 Hours

Programming Lab

Part A:

1. Write a C Program to find GCD using recursive function
2. Write a C Program to display Pascal Triangle using binomial function
3. Write a C Program to generate n Fibonacci numbers using recursive function.
4. Write a C Program to implement Towers of Hanoi.
5. Write a C Program to implement dynamic array, find smallest and largest element of the array.
6. Write a C Program to read the names of cities and arrange them alphabetically using bubble sort.
7. Write a C Program to sort the given list using selection sort technique.
8. Write a C Program to sort the given list using insertion sort technique.

Part B:

1. Write a C Program to sort the given list using quick sort technique.
2. Write a C Program to sort the given list using merge sort technique.
3. Write a C Program to search an element using linear search technique and recursive binary search technique.
4. Write a C Program to implement Stack.
5. Write a C Program to convert an infix expression to postfix.
6. Write a C Program to implement simple queue.
7. Write a C Program to implement linear linked list.
8. Write a C Program to implement traversal of a binary tree.

Evaluation Scheme for Lab Examination

Assessment Criteria		Marks
Program -1 from Part A	Write up of the program -1	5
Program -2 from Part B	Write up of the program -2	5
Execution and formatting (Any one program)		10
Viva Voce based on Lab Activities		05
Total		25

Course Code: CAC05	Course Object Oriented Programming concepts using JAVA
Course Credits: 03	Hours/Week: 03
Total Contact Hours: 42	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 03 Hours

Course Outcomes (COs):

After completing this course satisfactorily, a student will be able to:

- Understand the features of Java and the architecture of JVM
- Write, compile, and execute Java programs that may include basic data types and control flow constructs and how type casting is done
- Identify classes, objects, members of a class and relationships among them needed for a specific problem and demonstrate the concepts of polymorphism and inheritance
- The students will be able to demonstrate programs based on interfaces and threads and explain the benefits of JAVA's Exceptional handling mechanism compared to other Programming Language
- Write, compile, execute Java programs that include GUIs and event driven programming and also programs based on files

Content	Hours
Unit - 1	
Introduction to OOPS and Java: OOPS concepts and paradigm, Basics of Java programming, Data types, Variables, Operators, Control structures including selection, Looping, method Overloading, Math class, Arrays in java.	08
Unit - 2	
Objects and Classes: Basics of objects and classes in java, Constructors, Finalizer, Visibility modifiers, Methods and objects, Inbuilt classes like String, Character, String Buffer, File, this reference, I/O streams.	10
Unit-3	
Inheritance and Polymorphism: Inheritance in java, Super and sub class, Overriding, Object class, Polymorphism, Dynamic binding, Generic programming, Casting objects, Instance of operator, Abstract class, Interface in java, Package in java, UTIL package.	08

Unit-4	
Multithreading in java: Thread life cycle and methods, Runnable interface, Thread synchronization, Exception handling with try catch-finally, Collections in java, Introduction to JavaBeans and Network Programming.	6
Unit - 5	
Event and GUI programming: Event handling in java, Event types, Mouse and key events, GUI Basics, Panels, Frames, Layout Managers: Flow Layout, Border Layout, Grid Layout, GUI components like Buttons, Check Boxes, Radio Buttons, Labels, Text Fields, Text Areas, Combo Boxes, Lists, Scroll Bars, Sliders, Windows, Menus, Dialog Box, Applet and its life cycle, Introduction to swing.	10

Text Books

1. Programming with Java, By E Balagurusamy – A Primer, Fourth Edition, TataMcGraw Hill Education Private Limited.
2. Core Java Volume I – Fundamentals, By Cay S. Horstmann, Prentice Hall
3. Object Oriented Programming with Java : Somashekara, M.T., Guru, D.S.,Manjunatha, K.S

Reference Books:

1. Java 2 - The Complete Reference – McGraw Hill publication.
2. Java - The Complete Reference, 7th Edition, By Herbert Schildt– McGraw Hillpublication.

Course Code: CAC05P	Course Title: JAVA Lab
Course Credits: 02	Hours/Week: 04
Total Contact Hours: 52	Formative Assessment Marks: 25
Exam Marks: 25	Exam Duration: 04 Hours

Course Outcomes (COs):

After completing this course satisfactorily, a student will be able to:

- Implement Object Oriented programming concept using basic syntaxes of control Structures
- Identify classes, objects, members of a class and the relationships among them needed for a finding the solution to specific problem
- Demonstrates how to achieve reusability using inheritance
- Demonstrate understanding and use of interfaces, packages, different exception handling mechanisms and concept of multithreading for robust faster and efficient application development.
- Identify and describe common user interface components to design GUI in Java using Applet & AWT along with response to events

PART A: Java Fundamentals OOPs in Java

1. Program to add two integers and two float numbers. When no arguments are supplied, give a default value to calculate the sum. Use function overloading.
2. Program to perform mathematical operations. Create a class called AddSub with methods to add and subtract. Create another class called MulDiv that extends from AddSub class to use the member data of the super class. MulDiv should have methods to multiply and divide. A main function should access the methods and perform the mathematical operations.
3. Program with class variable that is available for all instances of a class. Use static variable declaration. Observe the changes that occur in the object's member variable values.
4. Program to create a student class with following attributes; Enrollment No: Name, Mark of sub1, Mark of sub2, mark of sub3, TotalMarks. Total of the three marks must be calculated only when the student passes in all three subjects. The pass mark for each subject is 50. If a candidate fails in any one of the subjects his total mark must be declared as zero. Using this condition write a constructor for this class. Write separate functions for accepting and displaying student details. In the main method create an array of n student objects and display the details.
5. In a college first year class are having the following attributes Name of the class (BCA, BCom, BSc), Name of the staff No of the students in the class, Array of students in the class. Define a class called first year with above attributes and define a suitable constructor. Also write a method called best Student () which process a first-year object and return the student with the highest total mark. In the main method define a first-year object and find the best student of this class
6. Program to define a class called employee with the name and date of appointment. Create ten employee objects as an array and sort them as per their date of

appointment. ie, print them as per their seniority.

PART B: Exception Handling & GUI Programming

1. Program to catch Negative Array Size Exception. This exception is caused when the array is initialized to negative values.
2. Program which create and displays a message on the window
3. Program to draw several shapes in the created window
4. Program which creates a frame with two buttons father and mother. When we click the father button the name of the father, his age and designation must appear. When we click mother similar details of mother also appear.
5. Program to move any one shape according to the arrow key pressed.
6. Program to create a window when we press M or m the window displays Good Morning, A or a the window displays Good After Noon E or e the window displays Good Evening, N or n the window displays Good Night
7. Demonstrate the various mouse handling events using suitable example.
8. Program to create menu bar and pull-down menus.

Evaluation Scheme for Lab Examination

Assessment Criteria		Marks
Program -1 from Part A	Write up of the program -1	5
Program -2 from Part B	Write up of the program -2	5
Execution and formatting (Any one program)		10
Viva Voce based on Lab Activities		05
Total		25

Course Code: CAC06	Course Title: Discrete Mathematical Structures
Course Credits: 03	Hours/Week: 03
Total Contact Hours: 42	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 03 Hours

Course Outcomes (COs):

After completing this course satisfactorily, a student will be able to:

- To understand the basic concepts of Mathematical reasoning, set and functions.
- To understand various counting techniques and principle of inclusion and exclusions.
- Understand the concepts of various types of relations, partial ordering and equivalence relations.
- Apply the concepts of generating functions to solve the recurrence relations.
- Familiarize the fundamental concepts of graph theory and shortest path algorithm

Discrete Mathematical Structures

Content	Hours
Unit - 1	
The Foundations: Logic and proofs: Propositional Logic, Applications of Propositional Logic, Propositional Equivalences, Predicates and Quantifiers, Nested Quantifiers, Rules of Inference, Introduction to Proofs, Proof Methods and Strategy. Basic Structures: Sets, Functions, Sequences, Sums, and Matrices: Sets, set operations, Functions, Sequences and Summations, matrices.	12
Unit - 2	
Counting: Basics of counting, Pigeonhole principle, Permutation and combination, Binomial Coefficient and Combination, Generating Permutation and Combination. Advanced Counting Techniques: Applications of Recurrence Relations, Solving Linear Recurrence, Relations, Divide and Conquer Algorithms and Recurrence Relations, Generating functions, Inclusion-Exclusion, Applications of Inclusion-exclusion	10

Unit - 3	
Induction and Recursion: Mathematical Induction, Strong Induction and Well-Ordering, Recursive Definitions and Structural Induction, Relation: Properties of relation, Composition of relation, Closer operation on relation, Equivalence relation and partition. Operation on relation, Representing relation.	12
Unit-4	
Graphs: Graphs and Graph models, Graph Terminology and Special Types of Graphs, Representing Graphs and Graph Isomorphism, Connectivity, Euler and Hamilton Paths, Shortest-Path Problems, Planar Graphs, Graph Coloring.	08

Text Book:

1. Discrete Mathematics and Its Applications, Kenneth H. Rosen: Seventh Edition, 2012.

References:

1. Discrete Mathematical Structure, Bernard Kolman, Robert C, Busby, Sharon Ross, 2003.
2. Graph Theory with Applications to Engg and Comp. Sci: Narsingh Deo-PHI 1986.
3. Discrete and Combinatorial Mathematics Ralph P. Grimaldi, B. V. Ramatta, Pearson, Education, 5 Edition.
4. Discrete Mathematical Structures, Trembley and Manohar.

BCA-Semester -III

Course Title: Database Management Systems	Course code: CAC07
Total Contact Hours: 42	Course Credits: 04
Formative Assessment Marks: 40	Duration of SEE/Exam: 03 Hours
Summative Assessment Marks: 60	

Course Outcomes (COs):

At the end of the course, students will be able to:

- Explain the various database concepts and the need for database systems.
- Identify and define database objects, enforce integrity constraints on a database using DBMS.
- Demonstrate a Data model and Schemas in RDBMS.
- Identify entities and relationships and draw ER diagram for a given real-world problem.
- Convert an ER diagram to a database schema and deduce it to the desired normal form.
- Formulate queries in Relational Algebra, Structured Query Language (SQL) for database manipulation.
- Explain the transaction processing and concurrency control techniques.

Database Management Systems (DBMS)

Unit	Description	Hours
1	Database Architecture: Introduction to Database system applications. Characteristics and Purpose of database approach. People associated with Database system. Data models. Database schema. Database architecture. Data independence. Database languages, and classification of DBMS.	10
2	E-R Model: Entity-Relationship modeling: E – R Model Concepts: Entity, Entity types, Entity sets, Attributes, Types of attributes, key attribute, and domain of an attribute. Relationships between the entities. Relationship types, roles and structural constraints, degree and cardinality ratio of a relationship. Weak entity types, E -R diagram.	10
3	Relational Data Model: Relational model concepts. Characteristics of relations. Relational model constraints: Domain constrains, key constraints, primary & foreign key constraints, integrity constraints and null values. Relational Algebra: Basic Relational Algebra operations. Set theoretical operations on relations. JOIN operations.	12

4	SQL and Data Normalization: SQL - Aggregate Functions and Grouping. Nested Sub Queries, Views. Normalization - Anomalies in relational database design. Decomposition. Functional dependencies. Normalization. First normal form, Second normal form, Third normal form. Boyce-Codd normal form.	10
5	<p>Introduction to PL/SQL programming: Introduction to PL/SQL • Features and Advantages, PL/SQL Blocks - basic syntax, Variables and their scope, Constants, Literals, Data Types, Operators, Executable Statements.</p> <p>Control Execution Flow • Conditional Control: IF Statements • CASE Statements • Iterative Control: Basic Loops -WHILE and FOR Loops, Reverse FOR LOOP Statement, Nested Loops, Labeling a PL/SQL Loop, exception handling.</p> <p>STRINGS: Declaring String Variables, String Functions and Operators, ARRAYS: Creating a Varray Type. Cursors - Implicit and Explicit Cursors, Cursor Attributes, parameterized Cursor, Functions and procedure – syntax and usage.</p>	10

References:

1. Fundamentals of Database Systems, Ramez Elamassri, Shankant B. Navathe, 7th Edition, Pearson, 2015
2. An Introduction to Database Systems, Bipin Desai, Galgotia Publications, 2010.
3. Introduction to Database System, C J Date, Pearson, 1999.
4. Database Systems Concepts, Abraham Silberschatz, Henry Korth, S.Sudarshan, 6th Edition, McGraw Hill, 2010.
5. Database Management Systems, Raghu Rama Krishnan and Johannes Gehrke, 3rd Edition, McGraw Hill, 2002
6. Oracle Database 11G PL/SQL Programming

Course Code: CAC07P	Course Title: DBMS LAB
Course Credits: 02	Hour of Teaching/Week: 04
Total Contact Hours: 52	Formative Assessment Marks: 25
Exam Marks: 25	Exam Duration: 03

Course Outcomes (COs):

After completing this course satisfactorily, a student will be able to:

- Formulate query, using SQL, solutions to a broad range of query and data update problems
- using SQL in database creation and interaction
- Design a commercial relational database system (Oracle, MySQL) by writing SQL using the system
- Use a desktop database package to create, populate, maintain, and query a database.
- Analyze an information storage problem and derive an information model expressed in the form and views
- Formulate PL SQL query blocks using cursor

Programming Lab

PART A: SQL Queries

1. Implementation of DDL and DML commands of SQL with suitable examples
a) Create table b) Alter table c) Drop Table d) Insert e) Update f) Delete
2. Implementation of different types of constraints.
3. Implementation of different types of Joins
a) Inner Join b) Outer Join c) Natural Join
4. Study and Implementation of
a) Group By &having clause b) Order by clause
5. Implementation of Views
6. Execute DCL and TCL Commands

PART B: PL/SQL

1. Create a library table with attributes book id, author_name, publisher, price and edition. Write PL/SQL code block to accept the publisher's name and count number of books under that publisher and display it. Also display the publisher with maximum publication.
2. Write a function to display employee name with distinct salaries
For e.g.
if a 's salary is 100
b 's salary is 200
c 's salary is 100 displays either (a or c) and b
3. Write a function to rank the employees based on their salary (use RANK function)
4. Write a function to validate the Employee email id.
5. Write a procedure to capture the error log in a table in case of an exception using Autonomous_transaction, from employee table, store ename and salary in varrays and display the contents of the arrays in table format.
6. Write an Anonymous block which raise a user defined exception on Thursday?

7. Write a PL/SQL cursor program which is used to calculate total salary from emp table without using sum () function?

Evaluation Scheme for Lab Examination

Assessment Criteria		Marks
Program -1 from Part A	Write up of the program -1	5
Program -2 from Part B	Write up of the program -2	5
Execution and formatting (Any one program)		10
Viva Voce based on Lab Activities		05
Total		25

Course Title: C# and Dot Net Framework	Course code: CAC08
Total Contact Hours: 42	Course Credits: 03
Formative Assessment Marks: 40	Duration of SEE/Exam: 03 Hours
Summative Assessment Marks: 60	

Course Outcomes (COs):

At the end of the course, students will be able to:

- Describe Object Oriented Programming concepts like Inheritance and Polymorphism in C# programming language.
- Interpret and Develop Interfaces for real-time applications.
- Build custom collections and generics in C#.

C# and Dot Net Framework

Unit	Description	Hours
1	<p>Introduction to C# and .NET platform and Building C# applications</p> <p>Introduction to C# and .NET platform: .NET solution, Building blocks of the .NET platform, Role of .NET base class libraries, .NET aware programming languages, Role of CIL, Role of Type Metadata, Role of Assembly Manifest, Tour of .NET namespaces.</p> <p>Building C# applications: Role of command line compiler(csc.exe), Building a C# application using csc.exe, command line debugger(cordbg.exe), Introduction to visual studio .NET IDE and its debugging, C# pre-processor directives.</p>	08
2	<p>C# language fundamentals: Anatomy of a basic C# class, Objects, Constructors, Default assignment and variables scope, Variable initialization syntax, Basic I/O with Console class, Arrays and String manipulation, Encapsulation services - Accessor and mutator methods, Class properties, Read and Write only properties, static properties. Inheritance - IS and AS keyword usage, Controlling Base class creation with base, Sealed classes, Delegation. Polymorphism - Virtual and override keywords, Abstract classes, Abstract Methods.</p>	08
3	<p>Exception & object life time and Interface and Collections:</p> <p>Exception & object life time: The Basics of Object Life Time, The Role Of Application Roots, Understanding Object Generations, The Role Of .NET Exception Handling, Throwing a Generic Exception, Catching Exceptions, Properties of Exception, Multiple Exception (Concepts Only). The Finally Block.</p> <p>Interface & Collections: Definition, Implementing an Interface in C#, Interface member sat object level, Interface as Parameters, Interface as Return Values, Arrays of Interface Types, Interface Hierarchies, Interface as polymorphic agents, Exploring the system. Collections Namespaces.</p>	08

4	Introducing windows forms: Overview of the system. windows. Forms Namespaces, An Anatomy of a Form, A Simple Form Program, Function with Control Class, The Functionality of the Form Class, Component class, control class, Programming with windows forms controls: Working with Button types, Check Boxes, Radio Buttons, Group Boxes, List Boxes, Calendar control, Timer, picture box, group box, scroll bar, Progress bar, assigning tool tips for controls. Developing an UI.	10
5	ADO .NET Connectivity: The Two Faces Of ADO. NET, Understanding ADO.NET Data Providers, Understanding the Connected Layer of ADO.NET, Working with Connection Object, Inserting, Updating and Deleting Records.	08

References:

1. "Programming in C#", E. Balagurusamy, 4th Edition, Tata McGraw-Hill, 2017.
2. "Pro C# with .NET 3.0", Andrew Troelsen
3. "Computing with C# and the .NET Framework", Arthur Gittleman, 2nd Edition, Jones & Bartlett Publishers, 2011

Course Code: CAC08P	Course Title: C# and Dot Net Framework Lab
Course Credits: 02	Hours/Week: 04
Total Contact Hours: 52	Formative Assessment Marks: 25
Exam Marks: 25	Exam Duration: 04 Hours

Practical:

Part - A

1. Develop a C# .NET console application to demonstrate the conditional statements.
2. Develop a C# .NET console application to demonstrate the control statements.
3. Develop a C#.NET console application to demonstrate exception handling.
4. Develop a C#.NET console application to find sum of all elements present in jagged array of 3 inner arrays.
5. Demonstrate arrays of interface types in C#.NET.
6. Construct a console application to demonstrate abstract class and abstract method.

Part – B

1. C#.NET console application to demonstrate window controls.
2. Demonstrate subroutines and functions I C#.net
3. Assume that 10 candidates have participated in an army selection drive. In the first round of selection, candidates are short listed based on their height. Minimum height for the selection is 157.5 cms. Read the height of those 10 candidates in centimeters and list the heights which are equal to or more than the minimum height required for the selection. Also count the number of candidates who have been shortlisted like this. (Program can be written with or without array).
4. Read 10 register numbers randomly and segregate them based on the course (BA, BSc, BCom, BCA) and semester (first, third, fifth- Analyse the format of the register numbers as assigned by the university).
5. C# program to call math operations (Any 4) using delegates.
6. Design an option driven program to demonstrate following garbage collection activities
 - a) Number of generations
 - b) Generation number of target object
 - c) Number of bytes allocated.
7. Develop an application in C#.NET that demonstrates the registration and login dynamically.

Evaluation Scheme for Lab Examination

Assessment Criteria		Marks
Program -1 from Part A	Write up of the program -1	5
Program -2 from Part B	Write up of the program -2	5
Execution and formatting (Any one program)		10
Viva Voce based on Lab Activities		05
Total		25

Course Title: Computer Communication and Networks	Course code: CAC09
Total Contact Hours: 42	Course Credits: 03
Formative Assessment Marks: 40	Duration of SEE/Exam: 03 Hours
Summative Assessment Marks: 60	

Course Outcomes (COs):

At the end of the course, students will be able to:

- Explain the transmission technique of digital data between two or more computers and a computer network that allows computers to exchange data.
- Apply the basics of data communication and various types of computer networks in real world applications.
- Compare the different layers of protocols.
- Compare the key networking protocols and their hierarchical relationship in the conceptual model like TCP/IP and OSI.

Computer Communication and Networks

Unit	Description	Hours
1	Introduction: Computer Network-Types & Applications, Network Software-Protocol Hierarchies, Network Topologies, LAN, WAN, MAN, OSI/ISO reference model, TCP/IP reference model, Comparison between OSI & TCP.	08
2	Physical Layer: Transmission Media – Twisted pair, coaxial cable, optical fiber, radio transmission, microwave transmission and infrared transmission, switching – Circuit switching, Packet switching, Difference between Circuit switching & Packet switching.	07
3	Data Link Layer: Data Link Layer design issues, Error detection – Single parity checking, Checksum, polynomial codes – CRC, Error correction- Hamming code, Elementary data link protocols- Unrestricted Simplex Protocol and Simplex Stop-and-Wait Protocol	08
4	Network Layer: Network layer design issues, Routing algorithms – Optimality Principle, Shortest path routing, Distance vector routing, Link state routing, Congestion & Congestion control algorithms – General Principles of Congestion control, Congestion Prevention Policies, Traffic Shaping-Leaky bucket algorithm, token bucket algorithm.	09

5	Transport Layer and Application Layer: Services provided by Transport layer to its upper layers, Transport Service primitives, Elements of Transport protocols, Internet transport protocols-UDP header &TCP segment header, Difference between TCP &UDP, DNS, Architecture &Services of E- Mail and Architecture of World Wide Web.	10
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References:

1. Computer Networks, Andrew S. Tanenbaum, 5th Edition, Pearson Education, 2010.
2. Data Communication & Networking, Behrouza A Forouzan, 3rd Edition, Tata McGraw Hill, 2001.
3. Hill, 2001.
4. Data and Computer Communications, William Stallings, 10th, Edition, Pearson Education, 2017.
5. Data Communication and Computer Networks, Brijendra Singh, 3rd Edition, PHI, 2012.
6. Data Communication & Network, Dr. Prasad, Wiley Dreamtech.
7. <http://highered.mheducation.com/sites/0072967757/index.htmls>

BCA-Semester IV

Course Title: Python Programming	Course code: CAC10
Total Contact Hours: 42	Course Credits: 03+02
Formative Assessment Marks: 40	Duration of SEE/Exam: 03 Hours
Summative Assessment Marks: 60	

Course Outcomes (COs):

- At the end of the course, students will be able to:
- Explain the basic concepts of Python Programming.
 - Demonstrate proficiency in the handling of loops and creation of functions.
 - Identify the methods to create and manipulate lists, tuples and dictionaries.
 - Discover the commonly used operations involving file handling.
 - Interpret the concepts of Object-Oriented Programming as used in Python.
 - Develop the emerging applications of relevant fields using Python.

Python Programming

Unit	Description	Hours
1	Introduction to Features and Applications of Python; Python Versions; Installation of Python; Python IDEs; Simple Python Program. Identifiers; Variables; Operators; Precedence and Association; Data Types; Indentation; Comments; Built-in Functions- Console Input and Console Output, Type Conversions; Python Libraries; Importing Libraries with Examples. Strings: Creating and Storing Strings; Accessing Sting Characters; the str () function; Operations on Strings- Concatenation, Comparison, Slicing and Joining, Traversing; Format Specifiers; Escape Sequences; Python String Methods.	08
2	Python Control Flow: Types of Control Flow; Control Flow Statements- if, else, elif, nested if, while loop, break, continue statements, for loop Statement; range () and exit () functions, pass statement. Python Functions: Types of Functions; Function Definition- Syntax, Function Calling, Passing Parameters/arguments, the return statement; Default Parameters; key Word Arguments; Recursive Functions	08
3	Arrays- what is an array, Access the element of an array, Length of an array, looping array element, adding array elements, Removing array elements and array methods. Passing array as an argument Lists: Creating Lists; Operations on Lists; Built-in Functions on Lists; Nested Lists. Dictionaries: Creating Dictionaries; Operations on Dictionaries; Built-in Functions on Dictionaries; Dictionary Methods; Populating and Traversing Dictionaries.	08

4	<p>Tuples and Sets: Creating Tuples; Operations on Tuples; Built-in Functions on Tuples; Tuple Methods; Creating Sets; Operations on Sets; Built-in Functions on Sets; Set Methods.</p> <p>Exception Handling: Types of Errors; Exceptions; Exception Handling using try, except and finally.</p> <p>Object Oriented Programming: Classes and Objects; Creating Classes and Objects; Constructor Method; Classes with Multiple Objects; Objects as Arguments; Objects as Return Values;</p>	08
5	<p>File Handling: File Types; Operations on Files– Create, Open, Read, Write, Close Files; File Names and Paths; Format Operator.</p> <p>Data analysis: NumPy – introduction, array creation, operations on arrays, panda – introduction, creating data frames and data fetching using simple queries.</p> <p>Data visualization: Introduction to data visualization, matplotlib library, different types of charts using pyplot – line, bar, histogram and pie charts.</p>	10

References:

1. Think Python How to Think Like a Computer Scientist, Allen Downey et al., 2nd Edition, Green Tea Press. Freely available online @ <https://www.greenteapress.com/thinkpython/thinkCSpy.pdf>, 2015.
2. Introduction to Python Programming, Gowrishankar S et al., CRC Press, 2019.
3. Python Data Analytics: Data Analysis and Science Using Pandas, matplotlib, and the Python Programming Language, Fabio Nelli, Apress®, 2015
4. Advance Core Python Programming, MeenuKohli, BPB Publications, 2021.
5. Core PYTHON Applications Programming, Wesley J. Chun, 3rd Edition, Prentice Hall, 2012.
6. Automate the Boring Stuff, Al Sweigart, No Starch Press, Inc, 2015.
7. Data Structures and Program Design Using Python, D Malhotra et al., Mercury Learning and Information LLC, 2021.
8. <http://www.ibiblio.org/g2swap/byteofpython/read/>
9. <https://docs.python.org/3/tutorial/index.html>

Course Title: Python Programming Lab	Course code: CAC10P
Total Contact Hours: 52	Course Credits: 02
Formative Assessment Marks: 25	Duration of SEE/Exam: 03 Hours
Summative Assessment Marks: 25	

Programs for Practical Component:

Part-A

1. Check if a number belongs to the Fibonacci Sequence
2. Solve Quadratic Equations
3. Find the sum of n natural numbers
4. Display Multiplication Tables
5. Check if a given number is a Prime Number or not
6. Implement a sequential search
7. Explore string functions
8. Read and write into a file

Part-B

1. Create a calculator program
2. Implement Selection Sort
3. Demonstrate exception handling
4. Demonstrate use of Dictionaries.
5. Demonstrate use of Tuples.
6. Drawing Line and bar chart using matplotlib.
7. Create array using NumPy and perform array operations
8. Create data frame from excel sheet and perform simple operations.

Evaluation Scheme for Lab Evaluation Scheme for
Lab Examination

Assessment Criteria		Marks
Program -1 from Part A	Write up of the program -1	5
Program -2 from Part B	Write up of the program -2	5
Execution and formatting (Any one program)		10
Viva Voce based on Lab Activities		05
Total		25

Course Title: Computer Multimedia & Animation	Course code: CAC11
Total Contact Hours: 42	Course Credits: 03
Formative Assessment Marks: 40	Duration of SEE/Exam: 03 Hours
Summative Assessment Marks: 60	

Course Outcomes (COs):

At the end of the course, students will be able to:

- Write a well-designed, interactive Web site with respect to current standards and practices.
- Demonstrate in-depth knowledge of an industry-standard multimedia development tool and its associated scripting language.
- Determine the appropriate use of interactive versus standalone Web applications.

Computer Multimedia & Animation

Unit	Description	Hours
1	Web Design: Origins and evolution of HTML, Basic syntax, Basic text markup, Images, Lists, Tables, Forms, Frame, Overview and features of HTML5.CSS: Introduction, Level soft style sheets, Style specification formats, Select or forms, Property value forms, Font properties, List properties, Color, Alignment of text, The and <div> tags; Overview and features of CSS3. JavaScript: Object orientation and JavaScript; General syntactic characteristics; Primitives, operations, and expressions; Screen output and keyboard input.	10
2	Animation: What is an Animation? The Start and End States, Interpolation, Animations in HTML. All About CSS Animations, creating a Simple Animation, Detailed Look at the CSS Animation Property, Keyframes, Declaring Multiple Animations, Wrap-up. All About CSS Transitions, adding a Transition, Looking at Transitions in Detail, The Longhand Properties, Longhand Properties vs. Shorthand Properties, Working with Multiple Transitions.	09
3	HTML5 – SVG: Viewing SVG Files, Embedding SVG in HTML5, HTML5 – SVG Circle, HTML5 – SVG Rectangle, HTML5 – SVG Line, HTML5 – SVG Ellipse, HTML5 – SVG Polygon, HTML5 – SVG Polyline, HTML5 – SVG Gradients, HTML5 – SVG Star.	08
4	HTML5 – CANVAS: The Rendering Context, Browser Support, HTML5 Canvas Examples, Canvas - Drawing Rectangles, Canvas - Drawing Paths, Canvas - Drawing Lines, Canvas - Drawing Bezier Curves, Canvas - Drawing Quadratic Curves, Canvas - Using Images, Canvas - Create Gradients,	08

5	HTML5 - Styles and Colors: Canvas - Text and Fonts, Canvas - Pattern and Shadow, Canvas - Save and Restore States, Canvas - Translation, Canvas -Rotation, Canvas - Scaling, Canvas - Transforms, HTML5 Canvas - Composition, Canvas – Animations.	07
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References:

1. The Complete Reference HTML and CSS, 5th Edition, Thomas A Powell, 2017.
2. Animation in HTML, CSS, and JavaScript, Kirupa Chinnathambi, CreateSpace Independent Pub, 2013.
3. <https://www.w3.org/Style/CSS/current-work#CSS3>
4. <http://bedford-computing.co.uk/learning/cascading-style-sheets-css/>

Course Title: Computer Multimedia & Animation Lab	Course code: CAC11P
Total Contact Hours: 52	Course Credits: 02
Formative Assessment Marks: 25	Duration of SEE/Exam: 03 Hours
Summative Assessment Marks: 25	

Programs for practical component

Part A

1. Develop and demonstrate a HTML document that illustrates a) Image as a background b) Hyperlink using an image c) Hyperlink with another web page (A, Base, Href) d) Link to email address, FTP Websites
2. Multimedia: - a) Develop a web page to play audio file using <a>Tag. b) Develop a web page to play video file using <Embed>Tag.
3. Write a JavaScript program to determine whether a given year is a leap year in the Gregorian calendar.
4. Write a JavaScript program to convert temperatures to and from Celsius, Fahrenheit
5. Create an animation using HTML.
6. Create an interactive web page using HTML5 layout tags.
7. Write a JavaScript that calculates the squares and cubes of the numbers from 0 to 10 and outputs HTML text that displays the resulting values in an HTML table format.
8. Demonstrate canvas in HTML5.

Part B

1. Develop and demonstrate a HTML document that illustrates a) the use of Formatting Text. b) Headings tags (H1, H2, H3, H4, H5, H6) c) Font Details (Font Size, Style, Type, Color) d) Setting Color (BG Color)
2. Develop and demonstrate a HTML document that illustrates a) Unordered List (UL) b) Ordered List (OL) and Definition list (DL) c) Table Alignment (Cell Spacing, Cell Padding, Height, Width, Border, Rowspan, colspan) d) Setting Different Table Attributes (Color, Image)
3. Create Style sheet to set formatting for text tags and embed that style sheet on web pages created for your site.
4. Design a timetable and display it in tabular format using html.
5. Design signup form to validate username, password, and phone numbers etc. using Java script
6. Write a JavaScript to design a simple calculator to perform the following operations: sum, product, difference and quotient
7. Develop and demonstrate a HTML5 file that includes JavaScript script that uses functions for the following problems: a. Parameter: A string b. Output: The position in the string of the left-most vowel c. Parameter: A number d. Output: The number with its digits in the reverse order
8. Write an HTML page that contains a selection box with a list of 5 countries. When the user selects a country, its capital should be printed next in the list. Add CSS to customize the properties of the font of the capital (color, bold and font size).

Evaluation Scheme for Lab Evaluation Scheme for Lab
Examination

Assessment Criteria		Marks
Program -1 from Part A	Write up of the program -1	5
Program -2 from Part B	Write up of the program -2	5
Execution and formatting (Any one program)		10
Viva Voce based on Lab Activities		05
Total		25

Course Title: Operating System Concepts	Course code: CAC12
Total Contact Hours: 42	Course Credits: 03
Formative Assessment Marks: 40	Duration of SEE/Exam: 03 Hours
Summative Assessment Marks: 60	

Course Outcomes (COs):

At the end of the course, students will be able to:

- Explain the fundamentals of the operating system.
- Comprehend multithreaded programming, process management, process synchronization, memory management and storage management.
- Compare the performance of Scheduling Algorithms
- Identify the features of I/O and File handling methods.

Operating System Concepts

Unit	Description	Hours
1	Introduction to Operating System: Definition of Operating System, Early systems – Batch Systems, Multiprogramming, Time Sharing, and Distributed systems. Special Purpose Systems – Real Time Systems and Handheld Systems. Opensource Operating Systems. Process Management: Process Concept- Process Definition, Process State, Process Control Block, Process scheduling- Scheduling Queues, Schedulers, Context switch. Operations on Processes- Creation and Termination of Processes. Inter process communication (IPC) - Definition, Independent and Co-operating processes.	10
2	CPU Scheduling: CPU I/O burst cycle, CPU Scheduler, Preemptive scheduling, Dispatcher. Scheduling criteria, Scheduling Algorithms- First-Come-First-Served (FCFS), Shortest Job First (SJF), Priority Scheduling, Round Robin scheduling algorithms, Multi-level queue scheduling (Concepts only) and Multi- level feedback queue scheduling (Concepts only). Multiple processor scheduling, Real time scheduling.	10
3	Deadlocks: Definition with example, System Model, Deadlocks Characterization- – Necessary Conditions, Resource Allocation Graph, Methods for Handling Deadlocks -Deadlock Prevention, Deadlock Avoidance, Deadlock Detection and Recovery from Deadlock.	08
4	Memory Management: Logical and Physical Address Space, Swapping, Contiguous Allocation, Paging, Segmentation, Segmentation with Paging. Virtual Memory: Definition, Demand Paging, Page Replacement Algorithms, Allocation of frames, Thrashing.	08

5	File System: File Concepts- Attributes, Operations and Types of Files. File Access methods, Directory Structure, Protection and consistency semantics. File System Implementation- File System Structure, File Allocation Methods, Free Space Management.	06
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References:

1. Operating System Concepts, Silberschatz' et al., 10th Edition, Wiley, 2018.
2. Operating System Concepts - Engineering Handbook, Ghosh PK, 2019.
3. Understanding Operating Systems, McHoes A et al., 7th Edition, Cengage Learning, 2014.
4. Operating Systems - Internals and Design Principles, William Stallings, 9th Edition, Pearson.
5. Operating Systems – A Concept Based Approach, Dhamdhere, 3rd Edition, McGrawHill Education India.
6. Modern Operating Systems, Andrew S Tanenbaum, 4th Edition, Pearson.

Syllabus for Open Electives in Computer Science:

Course Code: CSOE01	Course Title: Computer Fundamentals
Course Credits: 03	Hours/Week: 03
Total Contact Hours: 42	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 03 Hours

Course Outcomes (COs):

- Introduction to computers, classification of computers, anatomy of computer, constituents and architecture, microcontrollers
- Operating systems, functions of operating systems, classification of operating systems, kernel, shell, basics of Unix, shell programming, booting
- Databases, why databases are used, users, SQL, data types in SQL, introduction of queries - select, alter, update, delete, truncate, using where, and or in not in
- Internet basics, features, applications, services, internet service providers, domain name system, browsing, email, searching
- Web Programming basics, introduction of HTML and CSS programming
- Introduction of computers, classification of computers, anatomy of computer, constituents and architecture, microcontrollers.

Content	Hours
Unit - 1	
Fundamentals of Computers: Introduction to Computers - Computer Definition, Evolution and History of Computers, Basic Organisation of a Digital Computer; Number Systems – different types, conversion from one number system to another; Computer Codes – BCD, Gray Code, ASCII and Unicode; Boolean Algebra – Boolean Operators with Truth Tables; Types of Software – System Software and Utility Software; Computer Languages - Machine Level, Assembly Level & High Level Languages, Translator Programs – Assembler, Interpreter and Compiler; Planning a Computer Program - Algorithm, Flowchart and Pseudo code with Examples(at least 5 hours of teaching) .	10
Unit-2	
Introduction to Computer: Characteristics of computers, Classification of Digital Computer Systems: Microcomputers, Minicomputers, Mainframes, Super computers. Anatomy of Computer: Introduction, Functions & Components of a Computer, Central Processing Unit, Storage units, Input and output Devices. How CPU and	10

memory works. Program execution with illustrative examples. Introduction to microcontrollers.	
Unit-3	
Operating System Fundamentals: Operating Systems: Introduction, Functions of an operating System, Classification of Operating Systems, System programs, Application programs, Utilities, The Unix Operating System, Basic Unix commands, Microkernel Based Operating System, Booting.	08
Unit-4	
Introduction to Database Management Systems: Database, DBMS, Why Database -File system vs DBMS, Database applications, Database users, Introduction to SQL, Data types, Classification of SQL-DDL with constraints, DML, DCL, TCL	08
Unit-5	
Internet Basics: Introduction, Features of Internet, Internet application, Services of Internet, Logical and physical addresses, Internet Service Providers, Domain Name System. Web Basics: Introduction to web, web browsers, http/https, URL, HTML5, CSS	06

Text Books:

3. Pradeep K. Sinha and Priti Sinha: Computer Fundamentals (Sixth Edition), BPB Publication
4. David Riley and Kenny Hunt, Computational thinking for modern solver, Chapman & Hall/CRC,

Reference:

3. J. Glenn Brook shear, " Computer Science: An Overview", Addison-Wesley, Twelfth Edition,
4. R.G. Dromey, "How to solve it by Computer", PHI,

Course Code: CSOE02	Course Title: Problem Solving and C Programming Concepts
Course Credits: 03	Hours/Week: 03
Total Contact Hours: 42	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 03 Hours

Course Outcomes (COs):

- Introduction to computers, classification of computers, anatomy of computer, constituents and architecture, microcontrollers
- Operating systems, functions of operating systems, classification of operating systems, kernel, shell, basics of Unix, shell programming, booting
- Databases, why databases are used, users, SQL, data types in SQL, introduction of queries - select, alter, update, delete, truncate, using where, and or in not in
- Internet basics, features, applications, services, internet service providers, domain name system, browsing, email, searching
- Web Programming basics, introduction of HTML and CSS programming
- Introduction of computers, classification of computers, anatomy of computer, constituents and architecture, microcontrollers.

Course Content

Content	Hours
Unit – 1	
Problem Solving Techniques: Problem solving techniques – problem definition, analysis, design, debugging, testing, documentation and maintenance. Design Tools -ALGORITHM: definition, characteristics, advantages and disadvantages. FLOWCHART - definition, symbols, advantages and disadvantages. Writing an algorithm and flowchart: Area of circle, arithmetical operations, simple interest and compound interest, quadratic equation, largest of three numbers, sum of N natural numbers, factorial of number, Fibonacci series, prime number, reverse a given number, evaluation of series like $\sin(x)$, $\cos(x)$, e^x , $\log(x)$ etc.	10
Unit-2	
Introduction to C Programming: Overview of C; History and Features of C; Structure of a C Program with Examples; Creating and Executing a C Program; Compilation process in C. C Programming Basic Concepts: C Character Set; C tokens - keywords, identifiers, constants, and variables; Data types; Declaration & initialization of variables; Symbolic constants, Formatted I/O functions - <i>printf</i> and <i>scanf</i> .	10
Unit-3	

C Operators & Expressions: Arithmetic operators; Relational operators; Logical operators; Assignment operators; Increment & Decrement operators; Bitwise operators; Conditional operator; Special operators; Operator Precedence and Associativity; Evaluation of arithmetic expressions; Type conversion.	08
Unit-4	
Decision making, branching and looping: Decision making - if and if-else statement, nested if, else if ladder, switch statements, conditional operator, goto statement. Looping - while, do-while and for, nested for. break and continue statements. Programs on these concepts.	08
Unit-5	
Arrays: One Dimensional arrays - Declaration, Initialization and Memory representation; Two Dimensional arrays -Declaration, Initialization and Memory representation.	06

References :

1. Computer Concepts and Programming, Padma Reddy
2. Let us C , Yashwanth Kanetkar
3. Ansi C, Balagurusamy
4. Problem solving with C, M. T. Somashekara and D. S. Guru

Course Code: CSOE03	Course Title: Office Automation
Course Credits: 03	Hours/Week: 03
Total Contact Hours: 42	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 03 Hours

Content	Hours
Unit – 1	
Windows Desktop - GUI: Definition, Standards, Cursors/Pointers, Icons, GUI Menus, GUI-Share Data – Desktop icons and their functions: My computer, My documents, Network neighbourhood, Recycle Bin, Quick launch tool bar, System tray, Start menu, Task bar – Dialog Boxes: List Box, Spin Control Box, Slide, Drop-down list, Radio button, Check box, Text box, Task Bar - System Tray - Quick launch tool bar - Start button - Parts of Windows -Title bar-Menu bar - Scroll bar- Status bar, Maximize, Minimize, close and Resize & Moving a Window – Windows - Start Menu –Help Menu- Preview Menu; Logoff & Shutdown – Keyboard Accelerators: Key board short keys or hotkeys	06
Unit-2	
MS Word - Working with Documents -Opening & Saving files, Editing text documents, Inserting, Deleting, Cut, Copy, Paste, Undo, Redo, Find, Search, Replace, Formatting page & setting Margins, Converting files to different formats, Importing & Exporting documents, Sending files to others, Using Tool bars, Ruler, Using Icons, using help, Formatting Documents - Setting Font styles, Font selection- style, size, colour etc, Type face - Bold, Italic, Underline, Case settings, Highlighting, Special symbols, Setting Paragraph style, Alignments, Indents, Line Space, Margins, Bullets & Numbering. Setting Page style - Formatting Page, Page tab, Margins, Layout settings, Paper tray, Border & Shading, Columns, Header & footer, Setting Footnotes & end notes – Shortcut Keys; Inserting manual page break, Column break and line break, creating sections & frames, Anchoring & Wrapping, Setting Document styles, Table of Contents, Index, Page Numbering, date & Time, Author etc., Creating Master Documents, Web page. Creating Tables- Table settings, Borders, Alignments, Insertion, deletion, Merging, Splitting, Sorting, and Formula, Drawing - Inserting ClipArt, Pictures/Files etc., Tools – Word Completion, Spell	10

Checks, Mail merge, Templates, Printing Documents – Shortcut keys.	
Unit-3	
MS Excel: Spread Sheet & its Applications, Opening Spreadsheet, Menus - main menu, Formula Editing, Formatting, Toolbars, Using Icons, Using help, Shortcuts, Spreadsheet types. Working with Spreadsheets- opening, saving files, setting Margins, converting files to different formats (importing, exporting, sending files to others), Spread sheet addressing - Rows, Columns & Cells, Referring Cells & Selecting Cells – Shortcut Keys. Entering & Deleting Data- Entering data, Cut, Copy, Paste, Undo, Redo, Filling Continuous rows, columns, highlighting values, Find, Search & replace, Inserting Data, Insert Cells, Column, rows & sheets, Symbols, Data from external files, Frames, Clipart, Pictures, Files etc., Inserting Functions, Manual breaks, Setting Formula - finding total in a column or row, Mathematical operations (Addition, Subtraction, Multiplication, Division, Exponentiation), Using other Formulae. Formatting Spreadsheets, Formatting layout for Graphics, Clipart etc., Worksheet Row & Column Headers, Sheet Name, Row height & Column width, Visibility - Row, Column, Sheet, Security, Sheet Formatting & style, Sheet background, Colour etc., Borders & Shading – Shortcut keys. Working with sheets – Sorting, Filtering, Validation, Consolidation, and Subtotal. Creating Charts - Drawing. Printing. Using Tools.	10
Unit-4	
MS Power point: Introduction to presentation – Opening new presentation, Different presentation templates, setting backgrounds, Selecting presentation layouts. Creating a presentation - Setting Presentation style, Adding text to the Presentation. Formatting a Presentation - Adding style, Colour, gradient fills, arranging objects, Adding Header & Footer, Slide Background, Slide layout. Adding Graphics to the Presentation- Inserting pictures, movies, tables etc into presentation, Drawing Pictures using Draw. Adding Effects to the Presentation- Setting Animation & transition effect. Printing Handouts, Generating Standalone Presentation viewer.	10

Unit-5	
Internet and Web Browsers: Definition of Web Addressing-URL-Different types of Internet Connections; Dial up connection, Broad band (ISDN, DSL, Cable), Wireless (Wi-Fi, Wi-Max, Satellite, Mobile) naming convention, browsers and its types, internet browsing, searching - Search Engines - Portals - Social Networking sites-Blogs - viewing a webpage, downloading and uploading the website; Creating an email-ID, e-mail reading, saving, printing, forwarding and deleting the mails, checking the mails, viewing and running file attachments, addressing with cc and bcc.	06

References:

1. Fundamentals of computers - V.Rajaraman - Prentice- Hall of india
2. Microsoft Office 2007 Bible - John Walkenbach,Herb Tyson,Faithe Wempen,cary N.Prague,Michael R.groh,Peter G.Aitken, and Lisa a.Bucki -Wiley India pvt.ltd.
3. Computer Fundamentals - P. K. Sinha Publisher: BPB Publications.
4. Computer & Internet Basics Step-by-Step - Etc-end the Clutter - Infinity Publishing.
5. <https://en.wikipedia.org>
6. <http://windows.microsoft.com/en-in/windows/windows-basics-all-topics>

ELECTRONIC - COMMERCE

Course Code: CSOE04	Course Title: ELECTRONIC COMMERCE
Course Credits: 03	Hours/Week: 03
Total Contact Hours: 42	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 03 Hours

Course Outcomes (COs):

- Compare how internet and other information technologies support business processes.
- Demonstrate an overall perspective of the importance of application of internet technologies in business administration
- Explain the basic business management concepts.
- Demonstrate the basic technical concepts relating to E-Commerce.
- Identify the security issues, threats and challenges of E-Commerce.

Content Hours

Unit – 1	
Introduction to E-Commerce and Technology Infrastructure Working of Web - HTML Markup for Structure - Creating simple page - Marking up text - Adding Links - Adding Images - Table Markup - Forms - HTML	9
Unit-2	
Building an E-Commerce Website, Mobile Site and Apps: Systematic approach to build an E-Commerce: Planning, System Analysis, System Design, Building the system, Testing the system, Implementation and Maintenance, Optimize Web Performance – Choosing hardware and software – Other E-Commerce Site tools – Developing a Mobile Website and Mobile App	10
Unit-3	
E-Commerce Security and Payment Systems: E-Commerce Security Environment – Security threats in E-Commerce – Technology Solutions: Encryption, Securing Channels of Communication, Protecting Networks, Protecting Servers and Clients – Management Policies, Business Procedure and Public Laws - Payment Systems	09

Unit-4	
Business Concepts in E-Commerce: Digital Commerce Marketing and Advertising strategies and tools – Internet Marketing Technologies – Social Marketing – Mobile Marketing – Location based Marketing – Ethical, Social, Political Issues in E-Commerce	09
Unit-5	
Project Case Study: Case Study: Identify Key components, strategy, B2B, B2C Models of E-commerce Business model of any e-commerce website - Mini Project : Develop E-Commerce project in any one of Platforms like Woo-Commerce, Magento or Opencart	05

Text Book:

1. Kenneth C. Laudon, Carol Guercio Traver - E-Commerce, Pearson, 10th Edition, 2016

References:

1. <http://docs.opencart.com/>
2. <http://devdocs.magento.com/>
3. <http://doc.prestashop.com/display/PS15/Developer+tutorials>
4. Robbert Ravensbergen, –Building E-Commerce Solutions with Woo Commerce||, PACKT, 2nd Edition

WEB DESIGNING

Course Code: CSOE05	Course Title: WEB DESIGNING
Course Credits: 03	Hours/Week: 03
Total Contact Hours: 42	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 03 Hours

Course Outcomes (COs):

- Students can understand the basics of internet technology.
- Demonstrate the various tags useful to create a web page.
- Write HTML and understand how to effectively implement it in the web environment.
- Write CSS effectively to create well organized, styled web pages.

Content	Hours
Unit – 1	
Internet Basics: Basic concepts, communicating on the Internet, Internet Domains, Internet server identities – Registering a virtual domain with inter NIC, Domain Name Extension, establishing connectivity on the internet, Client IP Address – How Client IP Address are assigned, How ISPs achieve the task of assigning IP Address, How IP Address came into existence, A brief overview of TCP/IP and its services – Internet Protocol, Transmission control protocol – world wide web, FTP, Telnet.	08
Unit-2	
Introduction to HTML - Information files creation, Web server, Web browser – understanding how a browser communicates with a web server, establish connection, Client issues a request and sends a response, server terminates the connection.	10
Unit-3	
HTML: HTML tags, Paired tags, Singular tags, Structure of HTML program – Head, Body, Title and footers, Text Formatting tags – Paragraph breaks, line breaks,	08

Head styles, Drawing Lines, Text Styles – Bold, Italic, Underline, Centering (Text, Images., etc.). Lists: Types of Lists: Unordered list (Bullets), Ordered list (Numbering), Definition list Adding Graphics to HTML document: Using the border attribute, width and height attribute, align attribute, alt attribute. Tables: Introduction, the caption tag, Using the width and border attribute, cellpadding attribute, cellspacing attribute, the background-color property, the colspan and Rowspan attribute.	
Unit-4	
Linking Documents: External document references, Internal document references, hyper linking to a HTML FILE, Images as Hyperlinks. Frames: Introduction to frames- frameset tag, frame tag	08
Unit-5	
Dynamic HTML(DHTML): CSS (Cascading Style Sheets) – Font attributes, color and background attributes, Text attribute, Border attribute, Margin attributes, List attribute, Using the span and div tags, External Style Sheets.	08

Text Book:

1.HTML, JavaScript, DHTML and PHP – Ivan Bayross 4th edition

References:

1. <https://www.w3schools.com/TAGs/default.asp>
2. <https://w3schools.sinsixx.com/dhtml/>
3. Web Design with HTML & CSS: HTML & CSS Complete Beginner's Guide – Prem Kumar

Skill Enhancement Course:
BCA THIRD SEMESTER
Open-Source Tools

Course Code: SEC-1	Course Title: Open-Source tools
Course Credits: 02	Hours/Week: Theory -15 hour + 30 hours practical demonstration in classroom
Total Contact Hours: 45	Formative Assessment Marks: 25
Summative Assessments Marks: 25	Exam Duration: 01 hr.

course Outcomes (COs):

- Recognize the benefits and features of Opensource Technology and to interpret, contrast and compare opensource products among themselves
- Use appropriate opensource tools based on the nature of the problem
- Write code and compile different open-source software.

Course Content (Open-Source Tools)

Module	Details of topic	Duration
Module 1: Open Source Softwares	i. Introduction to Open sources, Need of Open Sources, Open Source –Principles, Standard Requirements, Advantages of Open Sources – ii. Free Software – FOSS iii. Licenses – GPL, LGPL, Copyrights, Patents, Contracts & Licenses and Related Issues iv. Application of Open Sources. Open-Source Operating Systems: FEDORA, UBUNTU	05 hours
Module 2: Programming Tools and Techniques	i. Usage of design Tools like Argo UML or equivalent ii. Version Control Systems like Git or equivalent iii. Bug Tracking Systems (Trac, BugZilla) iv. Bootstrap	05 hours

Module 3: Case Studies	i. Apache ii. Berkeley Software Distribution iii. Mozilla (Firefox) iv. Wikipedia v. Joomla vi. GNU Compiler Collection vii. Libre Office	05 hours
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Text Book:

1. KailashVadera, Bhavyesh Gandhi, "Open-Source Technology", Laxmi Publications Pvt.Ltd 2012, 1st Edition.

Reference Book:

1. Fadi P. Deek and James A. M. McHugh, "Open Source: Technology and Policy", Cambridge Universities Press 2007.

Pattern of continuous Evaluation and Semester End Examination

Total Marks for each course = 100

Continuous assessment (C1) = 20 marks

Continuous assessment (C2) = 20 marks

Semester End Examination (C3) = 60 marks

Formative evaluation process (Internal Assessment).

a. The first component (C1) of assessment is for 20 marks. This shall be based on tests, assignments, seminars, case studies, fieldwork, project work etc. This assessment and score process should be completed after completing 50% of the syllabus of the course/s and within 45 working days of the semester program.

b. The second component (C2) of assessment is for 20 marks. This shall be based on the test, assignment, seminar, case study, fieldwork, internship / industrial practicum/project work etc. This assessment and score process should be based on the completion of the remaining 50 per cent of the syllabus of the courses of the semester.

Summative evaluation process (Semester End theory Examination).

During the 17th – 19th week of the semester, a semester-end examination shall be conducted by the University for each course. This forms the third and final component of assessment (C3) and the maximum marks for the final component will be 60 marks.

Practical Examination: For the practical course of full credits, marks shall be for **50 marks** awarded as follows

Internal Assessment for 25 Marks: 15 Marks for maintaining Practical record and 10 marks for practical test. Test shall be conducted after the completion of Practical Classes.

End Semester Practical Examination: End Semester Practical examination shall be conducted for 25 marks.

**QUESTION PAPER PATTERN FOR DEGREE COURSES
(DSC, OE and Languages)**

**First Semester Degree Examination, April/May 2022
(CBCS NEP Scheme)**

Paper: DSC/OE/Languages

Time: 02 Hours

Max. Marks: 60

I. Select the most appropriate answer from the options provided: 10 x 1= 10

1).....

a) b) c) d)

2).....

a) b) c) d)

.

.

.

10).....

a) b) c) d)

II. Answer/Write short notes on any **FIVE** of the following: 05 x 03 = 15

1)

2)

3)

4)

5)

6)

7)

8)

III. Answer any **THREE** questions from the following: 03 x 05 = 15

1)

2)

3)

4)

5)

IV. Answer the following* 02 x 10 = 20

1) -----

OR

2) -----

OR

*May have sub questions if required

Syllabus Distribution for Question Paper Setting

Section-I	Ten Questions of each carrying 02 marks	Two questions from each unit
Section -II	Eight Questions of each carrying 03 marks	At least one question from each unit and remaining questions from those units with higher teaching hours
Section -III	Five Questions of each carrying 05 marks	At least one question from each unit.
Section -IV	Four Questions of each carrying 10 marks	First question from unit-1 or Second question from unit-2 ----- Third question from unit-3 or Fourth question from unit 4 & unit 5



NEP-2021

CURRICULUM STRUCTURE AND SYLLABUS

**Bachelor of Science (Basic and Honors) Programmes with
Computer Science as Major and Minor Courses**

And

Open Elective courses in Computer Science

w.e.f Academic Year 2021-22 onwards

The objectives of the Program

1. The primary objective of this program is to provide a foundation of computing principles for effectively using information systems and enterprise softwares.
2. It helps students analyze the requirements for system programming and exposes students for information systems
3. This programme provides students with options to specialize in various software system.
4. To produce outstanding Computer Scientists who can apply the theoretical knowledge into practice in the real world and develop standalone live projects themselves
5. To provide opportunity for the study of modern methods of information processing and its applications.
6. To develop among students the programming techniques and the problem-solving skills through programming
7. To prepare students who wish to go on to further studies in computer science and related subjects.
8. To acquaint students to Work effectively with a range of current, standard, OfficeProductivity software applications

Program Outcomes

1. **Discipline knowledge:** Acquiring knowledge on basics of Computer Science and ability to apply to design principles in the development of solutions for problems of varying complexity
2. **Problem Solving:** Improved reasoning with strong mathematical ability to Identify, formulate and analyze problems related to computer science and exhibiting a sound knowledge on data structures and algorithms.
3. **Design and Development of Solutions:** Ability to design and development of algorithmic solutions to real world problems.
4. **Programming a computer:** Exhibiting strong skills required to program a computer for various issues and problems of day-to-day scientific applications.
5. **Application Systems Knowledge:** Possessing a minimum knowledge to practice existing computer application software.
6. **Communication:** Must have a reasonably good communication knowledge both in oral and writing.
7. **Ethics on Profession, Environment and Society:** Exhibiting professional ethics to maintain the integrality in a working environment and also have concern on societal impacts due to computer-based solutions for problems.
8. **Lifelong Learning:** Should become an independent learner. So, learn to learn ability.
9. **Motivation to take up Higher Studies:** Inspiration to continue educations towards advanced studies on Computer Science.

Additional Program Outcomes for B.Sc (Hons) in Computer Science

The four years Bachelors in Computer Science (Hons) program enables students to attain the following additional attributes besides the afore-mentioned attributes:

1. Apply standard Software Engineering practices and strategies in real -time software project development
2. Design and develop computer programs/computer-based systems in the areas related to AI, algorithms, networking, web design, cloud computing, IoT and data analytics.
3. Acquaint with the contemporary trends in industrial/research settings and thereby innovate novel solutions to existing problems
4. The ability to apply the knowledge and understanding noted above to the analysis of a given information handling problem.
5. The ability to work independently on a substantial software project and as an effective team member.

Curriculum Structure

Program: B.Sc. (Basic and Honors) Subject: Computer Science

1. Computer Science as MAJOR with another Subject as MINOR (Table IIA of Model Curriculum)

Sem	Discipline Specific Core Courses (DSC)	Hour of Teaching/ Week		Discipline Specific Elective Courses (DSE)/ Vocational Courses (VC)	Hour of Teaching/ Week
		Theory	Lab		
1	DSC-1: Computer Fundamentals and Programming in C DSC-1Lab: C Programming Lab	4	4		
2	DSC-2: Data Structures using C DSC-2Lab: Data structures Lab	4	4		
3	DSC-3: Object Oriented Programming Concepts and Programming in JAVA DSC-3Lab: JAVA Lab	4	4		
4	DSC-4: Database Management Systems DSC-4Lab: DBMS Lab	4	4		
5	DSC-5: Programming in PYTHON DSC-6: Computer Networks DSC-5Lab: PYTHON Programming lab DSC-6Lab: Computer Networks Lab	3 3	4 4	VC-1: Any one from Vocational Courses, Group – 1*	3
6	DSC-7: Internet Technologies DSC-8: Operating System Concepts DSC-7Lab: JAVA Script, HTML, CSS Lab DSC-8Lab: C# Programming Lab	3 3	4 4	VC-2: Any one from Vocational Courses, Group – 2* Internship:	3 2
7	DSC-9: Computer Graphics and Visualization DSC-10: Design and Analysis of Algorithms DSC-11: Software Engineering DSC-9Lab: Computer Graphics and Visualization DSC-10Lab: Algorithms Lab	3 3 3	4 4	DSE-1: Any one from Discipline Specific Elective Courses, Group – 1** DSE-2: Any one from Discipline Specific Elective Courses, Group – 2** Research Methodology:	3 3 3
8	DSC-12: Artificial Intelligence and Applications DSC-13: Computer Organization and Architecture DSC-14: Data Warehousing and Data Mining DSC-12Lab: AI Lab	3 3 3	4	DSE-3: Any one from Discipline Specific Elective Courses, Group – 3** Research Project:	3 6

2. Computer Science as MINOR with another Subject as MAJOR (As per Table IIA of Model Curriculum)

Sem	Discipline Specific Core Courses (DSC)	Hour of Teaching/ Week	
		Theory	Lab
1	DSC-1: Computer Fundamentals and Programming in C DSC-1Lab: C Programming Lab	4	4
2	DSC-2: Data Structures using C DSC-2Lab: Data structures Lab	4	4
3	DSC-3: Object Oriented Programming Concepts and Programming in JAVA DSC-3Lab: JAVA Lab	4	4
4	DSC-4: Database Management Systems DSC-4Lab: DBMS Lab	4	4
5	DSC-5: Programming in PYTHON DSC-5Lab: PYTHON Programming lab	3	4
6	DSC-6: Internet Technologies DSC-6Lab: JAVA Script, HTML, CSS Lab	3	4

*** Vocational Courses:**

<p>Group-1:</p> <ul style="list-style-type: none"> • DTP, CAD and Multimedia • Hardware and Server Maintenance • Web Content Management Systems • E-Commerce • Web Designing 	<p>Group-2:</p> <ul style="list-style-type: none"> • Health Care Technologies • Digital Marketing • Office Automation • Multimedia Processing • Accounting Package
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**** Discipline Specific Elective Courses:**

<p>Group-1:</p> <ul style="list-style-type: none"> • IoT • Cyber Law and Cyber Security • Web Programming - PHP and MySQL • Clouds, Grids, and Clusters • Software Testing 	<p>Group-2:</p> <ul style="list-style-type: none"> • Information and Network Security • Data Compression • Discrete Structures • Opensource Programming • Multimedia Computing • Big Data 	<p>Group-3:</p> <ul style="list-style-type: none"> • Data Analytics • Storage Area Networks • Pattern Recognition • Digital Image Processing • Parallel Programming • Digital Signal Processing
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Open Electives in Computer Science:

- Office Automation
- Computer Fundamentals
- Problem Solving and C Programming Concepts
- Python Programming Concepts
- Web Designing
- Accounting Package
- E-Commerce
- Multimedia Processing
- R Programming
- E-Content Development
- Computer Animation

Syllabus for B.Sc (Basic and Honors) 1st and 2nd Semesters

Semester: I

Course Code: DSC-1	Course Title: Computer Fundamentals and Programming in C
Course Credits: 04	Hour of Teaching/Week: 04
Total Contact Hours: 52	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 03

Course Content

Content	Hours
Unit - 1	
Fundamentals of Computers: Introduction to Computers - Computer Definition, Characteristics Computers, Evolution and History of Computers, Types of Computers, Basic Organisation of a Digital Computer; Number Systems – different types, conversion from one number system to another; Computer Codes – BCD, Gray Code, ASCII and Unicode; Boolean Algebra – Boolean Operators with Truth Tables; Types of Software – System Software and Utility Software; Computer Languages - Machine Level, Assembly Level & High Level Languages, Translator Programs – Assembler, Interpreter and Compiler; Planning a Computer Program - Algorithm, Flowchart and Pseudo code with Examples. (at least 5hrs)	10
Unit - 2	
Introduction to C Programming: Over View of C; History and Features of C; Structure of a C Program with Examples; Creating and Executing a C Program; Compilation process in C. C Programming Basic Concepts: C Character Set; C tokens - keywords, identifiers, constants, and variables; Data types; Declaration & initialization of variables; Symbolic constants. Input and output with C: Formatted I/O functions - <i>printf</i> and <i>scanf</i> , control stings and escape sequences, output specifications with <i>printf</i> functions; Unformatted I/O functions to read and display single character and a string - <i>getchar</i> , <i>putchar</i> , <i>gets</i> and <i>puts</i> functions.	8
Unit - 3	
C Operators & Expressions: Arithmetic operators; Relational operators; Logical operators; Assignment operators; Increment & Decrement operators; Bitwise operators; Conditional operator; Special operators; Operator Precedence and Associatively; Evaluation of arithmetic expressions; Type conversion.	12
Control Structures: Decision making Statements - <i>Simple if</i> , <i>if_else</i> , <i>nested if_else</i> , <i>else_if ladder</i> , <i>Switch-case</i> , <i>goto</i> , <i>break</i> & <i>continue</i> statements; Looping Statements - Entry controlled and exit controlled statements, <i>while</i> , <i>do-while</i> , <i>for</i> loops, Nested loops.	
Unit - 4	
Arrays: One Dimensional arrays - Declaration, Initialization and Memory representation; Two Dimensional arrays - Declaration, Initialization and Memory representation. Strings: Declaring & Initializing string variables; String handling functions - <i>strlen</i> , <i>strcmp</i> , <i>strcpy</i> and <i>strcat</i> ; Character handling functions - <i>toascii</i> , <i>toupper</i> , <i>tolower</i> , <i>isalpha</i> , <i>isnumeric</i> etc.	12

<p>Pointers in C: Understanding pointers - Declaring and initializing pointers, accessing address and value of variables using pointers; Pointers and Arrays; Pointer Arithmetic; Advantages and disadvantages of using pointers;</p>	
<p>Unit - 5</p>	
<p>User Defined Functions: Need for user defined functions; Format of C user defined functions; Components of user defined functions - return type, name, parameter list, function body, return statement and function call; Categories of user defined functions - With and without parameters and return type.</p> <p>User defined data types: Structures - Structure Definition, Advantages of Structure, declaring structure variables, accessing structure members, Structure members initialization, comparing structure variables, Array of Structures; Unions - Union definition; difference between Structures and Unions.</p>	<p>10</p>

Text Books

1. Pradeep K. Sinha and Priti Sinha: Computer Fundamentals (Sixth Edition), BPB Publication
2. E. Balgurusamy: Programming in ANSI C (TMH)

References

1. Kamthane: Programming with ANSI and TURBO C (Pearson Education)
2. V. Rajaraman: Programming in C (PHI – EEE)
3. S. ByronGottfried: Programming with C (TMH)
4. Kernighan & Ritchie: The C Programming Language (PHI)
5. Yashwant Kanitkar: Let us C
6. P.B. Kottur: Programming in C (Sapna Book House)

Course Code: DSC-1Lab	Course Title: C Programming Lab
Course Credits: 02	Hour of Teaching/Week: 04
Total Contact Hours: 52	Formative Assessment Marks: 10
Exam Marks: 40	Exam Duration: 04

Practice Lab

The following activities be carried out/ discussed in the lab during the initial period of the semester.

1. Basic Computer Proficiency
 - a. Familiarization of Computer Hardware Parts
 - b. Basic Computer Operations and Maintenance.
 - c. Do's and Don'ts, Safety Guidelines in Computer Lab
2. Familiarization of Basic Software – Operating System, Word Processors, Internet Browsers, Integrated Development Environment (IDE) with Examples.
3. Type Program Code, Debug and Compile basic programs covering C Programming fundamentals discussed during theory classes.

Programming Lab Part

Part A:

1. Write a C Program to read radius and find area and volume of a sphere.
2. Write a C Program to read three numbers and find the biggest of three
3. Write a C Program to demonstrate library functions in *math.h* (at least 5)
4. Write a C Program to read a number, find the sum of the digits, reverse the number and check it for palindrome
5. Write a C Program to read numbers from keyboard continuously till the user presses 999 and to find the sum of only positive numbers
6. Write a C Program to read percentage of marks and to display appropriate grade (using switch case)
7. Write a C Program to find the roots of quadratic equation (if else ladder)
8. Write a C program to read marks scored in 3 subjects by n students and find the average of marks and result (Demonstration of single dimensional array)
9. Write a C Program to remove Duplicate Element in a single dimensional Array
10. Program to perform addition and subtraction of Matrices

Part B:

1. Write a C Program to find the length of a string without using built in function
2. Write a C Program to demonstrate string functions (at least 3).
3. Write a C Program to demonstrate pointers in C
4. Write a C Program to generate n prime number by defining *isprime ()* function
5. Write a C Program to find the trace of a square matrix using function
6. Write a C Program to read, display and multiply two matrices using functions
7. Write a C Program to read a string and to find the number of alphabets, digits, vowels, consonants, spaces and special characters.
8. Write a C Program to Reverse a String using Pointer
9. Write a C Program to demonstrate student structure to read & display records of n students.
10. Write a C Program to demonstrate the difference between structure & union.

Note: Student has to execute a minimum of 8 programs in each part to complete the Lab course

Evaluation Scheme for Lab Examination

Assessment Criteria		Marks
Program – 1 from Part A	Flowchart / Algorithm	04
	Writing the Program	05
	Execution and Formatting	06
Program -2 from Part B	Writing the Program	08
	Execution and Formatting	07
Viva Voce based on C Programming		05
Practical Record		05
Total		40

Semester: II

Course Code: DSC-2	Course Title: Data Structures using C
Course Credits: 04	Hour of Teaching/Week: 04
Total Contact Hours: 52	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 03

Course Outcomes (COs):

After completing this course satisfactorily, a student will be able to:

- Describe how arrays, records, linked structures, stacks, queues, trees, and graphs are represented in memory and used by algorithms
- Describe common applications for arrays, records, linked structures, stacks, queues, trees, and graphs
- Write programs that use arrays, records, linked structures, stacks, queues, trees, and graphs
- Demonstrate different methods for traversing trees
- Compare alternative implementations of data structures with respect to performance
- Describe the concept of recursion, give examples of its use
- Discuss the computational efficiency of the principal algorithms for sorting and searching

Course Content

Content	Hours
Unit - 1	
Introduction to data structures: Definition; Types of data structures - Primitive & Non-primitive, Linear and Non-linear; Operations on data structures. Algorithm Specification, Performance Analysis, Performance Measurement Recursion: Definition; Types of recursions; Examples - Fibonacci numbers, GCD, Binomial coefficient ${}^n C_r$, Towers of Hanoi; Comparison between iterative and recursive functions.	8
Unit - 2	
Arrays: Basic Concepts – Definition, Declaration, Initialization, Operations on arrays; Types of arrays; Arrays as abstract data types (ADT); Representation of Linear Arrays in memory; Traversing linear arrays; Inserting and deleting elements; Sorting – Selection sort, Bubble sort, Quick sort, Insertion sort, merge sort; Searching - Sequential Search, Binary search; Iterative and Recursive searching; Multidimensional arrays; Representation of multidimensional arrays; Sparse matrices.	12

Unit - 3	
<p>Stacks: Basic Concepts – Definition and Representation of stacks; Operations on stacks; Applications of stacks; Infix, postfix and prefix notations; Conversion from infix to postfix using stack; Evaluation of postfix expression using stack; Application of stack in function calls.</p> <p>Queues: Basic Concepts – Definition and Representation of queues; Types of queues – Simple queues, Circular queues, Double ended queues, Priority queues; Operations on Simple queues;</p>	10
Unit - 4	
<p>Dynamic memory allocation: Static & Dynamic memory allocation; Memory allocation and de-allocation functions - malloc, calloc, realloc and free.</p> <p>Linked list: Basic Concepts – Definition and Representation of linked list, Types of linked lists - Singly linked list, Doubly linked list, Header linked list, Circular linked list; Representation of Linked list in Memory;</p> <p>Operations on Singly linked lists – Traversing, Searching, Insertion, Deletion; Memory allocation; Garbage collection</p>	12
Unit - 5	
<p>Trees: Definition; Tree terminologies –node, root node, parent node, ancestors of a node, siblings, terminal & non-terminal nodes, degree of a node, level, edge, path, depth;</p> <p>Binary tree: Type of binary trees - strict binary tree, complete binary tree, binary search tree and heap tree; Array representation of binary tree. Traversal of binary tree; preorder, inorder and postorder traversal; Reconstruction of a binary tree when any two of the traversals are given.</p>	10

Text Books

1. Sartaj Sahani: Fundamentals of Data Structures

References

1. Tanenbaum: Data structures using C (Pearson Education)
2. Kamathane: Introduction to Data structures (Pearson Education)
3. Y. Kanitkar: Data Structures Using C (BPB)
4. Sudipa Mukherjee: Data Structures using C – 1000 Problems and Solutions (McGraw Hill Education, 2007)

Course Code: DSC-2Lab	Course Title: Data Structures Lab
Course Credits: 02	Hour of Teaching/Week: 04
Total Contact Hours: 52	Formative Assessment Marks: 10
Exam Marks: 40	Exam Duration: 04

Programming Lab

Part A:

1. Write a C Program to find GCD using recursive function
2. Write a C Program to display Pascal Triangle using binomial function
3. Write a C Program to generate n Fibonacci numbers using recursive function.
4. Write a C Program to implement Towers of Hanoi.
5. Write a C Program to implement dynamic array, find smallest and largest element of the array.
6. Write a C Program to read the names of cities and arrange them alphabetically using bubble sort.
7. Write a C Program to sort the given list using selection sort technique.
8. Write a C Program to sort the given list using insertion sort technique.

Part B:

1. Write a C Program to sort the given list using quick sort technique.
2. Write a C Program to sort the given list using merge sort technique.
3. Write a C Program to search an element using linear search technique and recursive binary search technique.
4. Write a C Program to implement Stack.
5. Write a C Program to convert an infix expression to postfix.
6. Write a C Program to implement simple queue.
7. Write a C Program to implement linear linked list.
8. Write a C Program to implement traversal of a binary tree.

Evaluation Scheme for Lab Examination

Assessment Criteria		Marks
Program – 1 from Part A	Algorithm	02
	Writing the Program	05
	Execution and Formatting	05
Program -2 from Part B	Algorithm	04
	Writing the Program	06
	Execution and Formatting	08
Viva Voce based on Data Structures		05
Practical Record		05
Total		40

Syllabus for Open Electives in Computer Science:

Course Code: CSOE-1	Course Title: Computer Fundamentals
Course Credits: 03	Hour of Teaching/Week: 03
Total Contact Hours: 42	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 03

Course Outcomes (COs):

After completing this course satisfactorily, a student will be able to:

- Introduction to computers, classification of computers, anatomy of computer, constituents and architecture, microcontrollers
- Operating systems, functions of operating systems, classification of operating systems, kernel, shell, basics of Unix, shell programming, booting
- Databases, why databases are used, users, SQL, data types in SQL, introduction of queries - select, alter, update, delete, truncate, using where, and or in not in
- Internet basics, features, applications, services, internet service providers, domain name system, browsing, email, searching
- Web Programming basics, introduction of HTML and CSS programming
- Introduction of computers, classification of computers, anatomy of computer, constituents and architecture, microcontrollers.

Course Content

Content	Hours
Unit - 1	
Fundamentals of Computers: Introduction to Computers - Computer Definition, Evolution and History of Computers, Basic Organisation of a Digital Computer; Number Systems – different types, conversion from one number system to another; Computer Codes – BCD, Gray Code, ASCII and Unicode; Boolean Algebra – Boolean Operators with Truth Tables; Types of Software – System Software and Utility Software; Computer Languages - Machine Level, Assembly Level & High Level Languages, Translator Programs – Assembler, Interpreter and Compiler; Planning a Computer Program - Algorithm, Flowchart and Pseudo code with Examples(at least 5 hours of teaching .	10
Unit-2	

<p>Introduction to Computer: Characteristics of computers, Classification of Digital Computer Systems: Microcomputers, Minicomputers, Mainframes, Super computers.</p> <p>Anatomy of Computer: Introduction, Functions & Components of a Computer, Central Processing Unit, Storage units, Input and output Devices. How CPU and memory works. Program execution with illustrative examples. Introduction to microcontrollers.</p>	10
Unit-3	
<p>Operating System Fundamentals: Operating Systems: Introduction, Functions of an operating System, Classification of Operating Systems, System programs, Application programs, Utilities, The Unix Operating System, Basic Unix commands, Microkernel Based Operating System, Booting.</p>	08
Unit-4	
<p>Introduction to Database Management Systems: Database, DBMS, Why Database -File system vs DBMS, Database applications, Database users, Introduction to SQL, Data types, Classification of SQL-DDL with constraints, DML, DCL, TCL</p>	08
Unit-5	
<p>Internet Basics: Introduction, Features of Internet, Internet application, Services of Internet, Logical and physical addresses, Internet Service Providers, Domain Name System.</p> <p>Web Basics: Introduction to web, web browsers, http/https, URL, HTML5, CSS</p>	06

Text Books:

1. Pradeep K. Sinha and Priti Sinha: Computer Fundamentals (Sixth Edition), BPB Publication
2. David Riley and Kenny Hunt, Computational thinking for modern solver, Chapman & Hall/CRC,

Reference:

1. J. Glenn Brook shear, "Computer Science: An Overview", Addison-Wesley, Twelfth Edition,
2. R.G. Dromey, "How to solve it by Computer", PHI,

Course Code: CSOE02	Course Title: Problem Solving and C Programming Concepts
Course Credits: 03	Hours/Week: 03
Total Contact Hours: 42	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 03 Hours

Course Outcomes (COs):

After completing this course satisfactorily, a student will be able to:

1. Introduction to computers, classification of computers, anatomy of computer, constituents and architecture, microcontrollers
2. Operating systems, functions of operating systems, classification of operating systems, kernel, shell, basics of Unix, shell programming, booting
3. Databases, why databases are used, users, SQL, data types in SQL, introduction of queries - select, alter, update, delete, truncate, using where, and or in not in
4. Internet basics, features, applications, services, internet service providers, domain name system, browsing, email, searching
5. Web Programming basics, introduction of HTML and CSS programming
6. Introduction of computers, classification of computers, anatomy of computer, constituents and architecture, microcontrollers.

Course Content

Content	Hours
Unit – 1	
Problem Solving Techniques: Problem solving techniques – problem definition, analysis, design, debugging, testing, documentation and maintenance. Design Tools - ALGORITHM: definition, characteristics, advantages and disadvantages. FLOWCHART - definition, symbols, advantages and disadvantages. Writing an algorithm and flowchart: Area of circle, arithmetical operations, simple interest and compound interest, quadratic equation, largest of three numbers, sum of N natural numbers, factorial of number, Fibonacci series, prime number, reverse a given number, evaluation of series like $\sin(x)$, $\cos(x)$, e^x , $\log(x)$ etc.	10
Unit-2	

<p>Introduction to C Programming: Overview of C; History and Features of C; Structure of a C Program with Examples; Creating and Executing a C Program; Compilation process in C.</p> <p>C Programming Basic Concepts: C Character Set; C tokens - keywords, identifiers, constants, and variables; Data types; Declaration & initialization of variables; Symbolic constants, Formatted I/O functions - printf and scanf,</p>	10
Unit-3	
<p>C Operators & Expressions: Arithmetic operators; Relational operators; Logical operators; Assignment operators; Increment & Decrement operators; Bitwise operators; Conditional operator; Special operators; Operator Precedence and Associativity; Evaluation of arithmetic expressions; Type conversion.</p>	08
Unit-4	
<p>Decision making, branching and looping: Decision making - if and if-else statement, nested if, else if ladder, switch statements, conditional operator, goto statement. Looping - while, do-while and for, nested for. break and continue statements. Programs on these concepts.</p>	08
Unit-5	
<p>Arrays: One Dimensional arrays - Declaration, Initialization and Memory representation; Two Dimensional arrays - Declaration, Initialization and Memory representation.</p>	06

References :

1. Computer Concepts and Programming, Padma Reddy
2. Let us C , Yashwanth Kanetkar
3. Ansi C, Balagurusamy
4. Problem solving with C, M. T. Somashekara and D. S. Guru

Course Code: CAO E03	Course Title: Office Automation
Course Credits: 03	Hours/Week: 03
Total Contact Hours: 42	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 03 Hours

Course Content

Content	Hours
Unit - 1	
Windows Desk top - GUI: Definition, Standards, Cursors/Pointers, Icons, GUI Menus, GUI-Share Data – Desktop icons and their functions: My computer, My documents, Network neighbourhood, Recycle Bin, Quick launch tool bar, System tray, Start menu, Task bar – Dialog Boxes: List Box, Spin Control Box, Slide, Drop-down list, Radio button, Check box, Text box, Task Bar - System Tray - Quick launch tool bar - Start button - Parts of Windows -Title bar-Menu bar - Scroll bar- Status bar, Maximize, Minimize, close and Resize & Moving a Window – Windows - Start Menu –Help Menu- Preview Menu; Logoff & Shutdown – Keyboard Accelerators: Key board short keys or hotkeys	06
Unit-2	
MS Word - Working with Documents -Opening & Saving files, Editing text documents, Inserting, Deleting, Cut, Copy, Paste, Undo, Redo, Find, Search, Replace, Formatting page & setting Margins, Converting files to different formats, Importing & Exporting documents, Sending files to others, Using Tool bars, Ruler, Using Icons, using help, Formatting Documents - Setting Font styles, Font selection- style, size, colour etc, Type face - Bold, Italic, Underline, Case settings, Highlighting, Special symbols, Setting Paragraph style, Alignments, Indents, Line Space, Margins, Bullets & Numbering. Setting Page style - Formatting Page, Page tab, Margins, Layout settings, Paper tray, Border & Shading, Columns, Header & footer, Setting Footnotes & end notes – Shortcut Keys; Inserting manual page break, Column break and line break, creating sections & frames, Anchoring & Wrapping, Setting Document styles, Table of Contents, Index, Page Numbering, date & Time, Author etc., Creating Master Documents, Web page. Creating Tables- Table settings, Borders, Alignments, Insertion, deletion, Merging, Splitting, Sorting, and Formula, Drawing - Inserting ClipArt, Pictures/Files etc., Tools – Word Completion, Spell	10

Checks, Mail merge, Templates, Printing Documents – Shortcut keys.	
Unit-3	
MS Excel: Spread Sheet & its Applications, Opening Spreadsheet, Menus - main menu, Formula Editing, Formatting, Toolbars, Using Icons, Using help, Shortcuts, Spreadsheet types. Working with Spreadsheets- opening, saving files, setting Margins, Converting files to different formats (importing, exporting, sending files to others), Spread sheet addressing - Rows, Columns & Cells, Referring Cells & Selecting Cells – Shortcut Keys. Entering & Deleting Data- Entering data, Cut, Copy, Paste, Undo, Redo, Filling Continuous rows, columns, Highlighting values, Find, Search & replace, Inserting Data, Insert Cells, Column, rows & sheets, Symbols, Data from external files, Frames, Clipart, Pictures, Files etc, Inserting Functions, Manual breaks, Setting Formula - finding total in a column or row, Mathematical operations (Addition, Subtraction, Multiplication, Division, Exponentiation), Using other Formulae. Formatting Spreadsheets, Formatting layout for Graphics, Clipart etc., Worksheet Row & Column Headers, Sheet Name, Row height & Column width, Visibility - Row, Column, Sheet, Security, Sheet Formatting & style, Sheet background, Colour etc, Borders & Shading – Shortcut keys. Working with sheets – Sorting, Filtering, Validation, Consolidation, and Subtotal. Creating Charts - Drawing. Printing. Using Tools	10
Unit-4	
MS Power point: Introduction to presentation – Opening new presentation, Different presentation templates, Setting backgrounds, Selecting presentation layouts. Creating a presentation - Setting Presentation style, Adding text to the Presentation. Formatting a Presentation - Adding style, Colour, gradient fills, Arranging objects, Adding Header & Footer, Slide Background, Slide layout. Adding Graphics to the Presentation- Inserting pictures, movies, tables etc into presentation, Drawing Pictures using Draw. Adding Effects to the Presentation- Setting Animation & transition effect. Printing Handouts, Generating Standalone Presentation viewer.	10
Unit-5	

Internet and Web Browsers: Definition of WebAddressing-URL-Different types of Internet Connections; Dial up connection, Broad band (ISDN, DSL, Cable), Wireless (Wi-Fi, WiMax, Satellite, Mobile) naming convention, browsers and its types, internet browsing, searching - Search Engines - Portals - Social Networking sites- Blogs - viewing a webpage, downloading and uploading the website; Creating an email-ID, e-mail reading, saving, printing, forwarding and deleting the mails, checking the mails, viewing and running file attachments, addressing with cc and bcc.

06

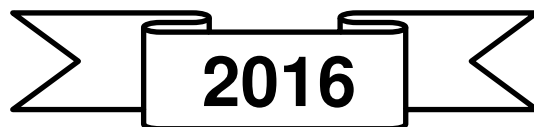
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1. Fundamentals of computers - V.Rajaraman - Prentice- Hall of india
2. Microsoft Office 2007 Bible - John Walkenbach,Herb Tyson,Faithe Wempen,cary N.Prague,Michael R.groh,Peter G.Aitken, and Lisa a.Bucki -Wiley India pvt.ltd.
3. Computer Fundamentals - P. K. Sinha Publisher: BPB Publications.
4. Computer & Internet Basics Step-by-Step - Etc-end the Clutter - Infinity Publishing.
5. <https://en.wikipedia.org>
6. <http://windows.microsoft.com/en-in/windows/windows-basics-all-topics>



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**Chemistry Syllabus for B.Sc. Course- 2016
(SEMESTER SCHEME)
(w.e.f. June - 2016)**



KUVEMPU UNIVERSITY
Chemistry Syllabus for B.Sc. Course – 2016
(SEMESTER SCHEME)
(w.e.f. June - 2016)

PREFACE

Science and Science education plays an important role in the development of any modern society. An effective science education can be imparted at the undergraduate level only by revamping the present curriculum and teaching to make it effective and meaningful. For this, the curriculum should be composed, giving emphasis to various aspects such as the creativity of students, awareness of basic knowledge of science, especially chemistry because chemistry is a border science to biology, physics and engineering and many other branches of science. Hence the syllabus of undergraduate courses in chemistry is prepared to give sound knowledge, understanding of chemistry. The goal of the syllabus is to make the study of chemistry stimulating, relevant and interesting. The syllabus is prepared with a view to equipping the students to contribute their knowledge and skills to academic and industrial environments and also will expose students to various fields in chemistry and in the related disciplines. The emphasis is given in the syllabus for training the students in laboratory skills and instrumentation.

This new syllabus has been prepared in a participatory manner, after discussions with a number of faculty members in the subject and also after evaluating the existing syllabi of B.Sc., the new syllabi of XI and XII standards and U.G.C. model curriculum and the syllabi of other Universities. The units of the syllabus are well defined and the scope of each is given in detail. The number of contact hours required for each unit is also given. A list of reference books is provided at the end of each unit.

OBJECTIVES

- To expose students into various fields in chemistry and to understand basic facts and concepts in Chemistry, to develop interest in the study of chemistry, and advanced aspects of related disciplines.
- To acquire the knowledge of terms, facts, concepts, techniques and principles of the subject and to develop the ability to apply skills in the proper handling of apparatus and chemicals.
- To develop problem solving skills.
- To be familiarized with the emerging areas of Chemistry their applications in various areas of Chemical sciences and empower students to meet the challenges of tomorrow.

Chemistry Syllabus for B.Sc. Course – 2016 (SEMESTER SCHEME)
(w.e.f. June - 2016)

Pattern and Scheme of Examination under Semester Scheme
approved by UG-BOS in Chemistry held on 25-11-2015.

: SYLLABUS PATTERN :

<p><u>First Semester:</u> <u>Paper-I; CHEMISTRY - I (60 hours)</u> <u>(15 hours/unit, 04 hours/week)</u> <u>Theory:</u> Unit-I: Analytical Chemistry Unit-II: Inorganic Chemistry Unit-III: Organic Chemistry Unit-IV: Physical Chemistry <u>Practical: Paper-I (03 hours/week)</u></p>	<p><u>Second Semester:</u> <u>Paper-II; CHEMISTRY - II (60 hours)</u> <u>(15 hours/unit, 04 hours/week)</u> <u>Theory:</u> Unit-I: Analytical Chemistry Unit-II: Inorganic Chemistry Unit-III: Organic Chemistry Unit-IV: Physical Chemistry <u>Practical: Paper-II (03 hours/week)</u></p>
<p><u>Third Semester:</u> <u>Paper-III; CHEMISTRY - III (60 hours)</u> <u>(15 hours/unit, 04 hours/week)</u> <u>Theory:</u> Unit-I: Analytical Chemistry Unit-II: Inorganic Chemistry Unit-III: Organic Chemistry Unit-IV: Physical Chemistry <u>Practical: Paper-III (03 hours/week)</u></p>	<p><u>Fourth Semester:</u> <u>Paper-IV; CHEMISTRY - IV (60 hours)</u> <u>(15 hours/unit, 04 hours/week)</u> <u>Theory:</u> Unit-I: Analytical Chemistry Unit-II: Inorganic Chemistry Unit-III: Organic Chemistry Unit-IV: Physical Chemistry <u>Practical: Paper-IV (03 hours/week)</u></p>
<p><u>Fifth Semester:</u> <u>Paper-V; CHEMISTRY - V (45 hours)</u> <u>(15 hours/unit, 03 hours/week)</u> <u>Theory:</u> Unit-I: Analytical Chemistry Unit-II: Inorganic Chemistry Unit-III: Organic Chemistry <u>Practical: Paper-V (03 hours/week)</u></p>	<p><u>Fifth Semester:</u> <u>Paper-VI; CHEMISTRY - VI (45 hours)</u> <u>(15 hours/unit, 03 hours/week)</u> <u>Theory:</u> Unit-I: Physical Chemistry Unit-II: Analytical Chemistry Unit-III: Inorganic Chemistry <u>Practical: Paper-VI (03 hours/week)</u></p>
<p><u>Sixth Semester:</u> <u>Paper-VII; CHEMISTRY - VII (45 hours)</u> <u>(15 hours/unit, 03 hours/week)</u> <u>Theory:</u> Unit-I: Organic Chemistry Unit-II: Physical Chemistry Unit-III: Analytical Chemistry <u>Practical: Paper-VII (03 hours/week)</u></p>	<p><u>Sixth Semester:</u> <u>Paper-VIII; CHEMISTRY - VIII (45 hours)</u> <u>Theory:</u> Unit-I: Inorganic Chemistry Unit-II: Organic Chemistry Unit-III: Physical Chemistry <u>Practical: Paper-VIII (03 hours/week)</u></p>

Chemistry Syllabus for B.Sc. Course – 2016 (SEMESTER SCHEME)
(w.e.f. June - 2016)
Examination Pattern

: EXAMINATION PATTERN :											
THEORY						PRACTICALS					Grand Total
Semester	Paper	Duration	Max. Marks	IA	Total	Paper	Duration	Max. Marks	IA	Total	
I	<u>Paper-I</u>	3 hours	50	10	60	<u>Paper-I</u>	3 hours	40	-	40	100
II	<u>Paper-II</u>	3 hours	50	10	60	<u>Paper-II</u>	3 hours	40	-	40	100
III	<u>Paper-III</u>	3 hours	50	10	60	<u>Paper-III</u>	3 hours	40	-	40	100
IV	<u>Paper-IV</u>	3 hours	50	10	60	<u>Paper-IV</u>	3 hours	40	-	40	100
V	<u>Paper-V</u>	3 hours	50	10	60	<u>Paper-V</u>	3 hours	40	-	40	200
	<u>Paper-VI</u>	3 hours	50	10	60	<u>Paper-VI</u>	3 hours	40	-	40	
VI	<u>Paper-VII</u>	3 hours	50	10	60	<u>Paper-VII</u>	3 hours	40	-	40	200
	<u>Paper-VIII</u>	3 hours	50	10	60	<u>Paper-VIII</u>	3 hours	40	-	40	
Theory (Final exam)			Internals			Practical			Total Marks:		
400			80			320			I to VI SEMESTER		
			(For each paper, two IA's (Tests) per semester, each carrying 20 marks and averaged to 10 marks)						800		

Question paper pattern for FIRST to FOURTH Semesters

Instructions:

- a) The question paper contains three parts, Part-A, B, C and D.
- b) Part-A (1 mark questions), Part-B (2 marks questions), Part-C (4 marks questions) and Part-D (8 marks questions).
- c) Examination duration = 3 hours; Maximum marks = 50.

PART-A

Answer the following in a word, phrase or a sentence. 8×1=8

- Q. 1. a
b
c
d
e
f
g
h

PART-B

Answer any FIVE of the following questions. 5×2=10

- Q. 2. a
b
c
d
e
f
g
h

PART-C

Answer Any FOUR of the following questions. 4×4=16

- Q. 3.
Q. 4.
Q. 5.
Q. 6.
Q. 7.
Q. 8.

PART-D

Answer Any TWO of the following questions.

2×8=16

Q. 09.

Q. 10.

Q. 11.

Q. 12.

NOTE: Question paper setting pattern (Instructions to question paper setters)

Part-A & B: Question no. 1 and 2: TWO questions shall be selected from each Unit.

Part-C: Minimum ONE question shall be selected from each Unit. Each Question carries 4 Marks.

Part-D: One question shall be selected from each Unit. Each question carries 8 Marks. Subdivisions, if required, should not exceed a) & b) with a marks distribution of 3+5 or 4+4.

Question paper pattern for FIFTH and SIXTH Semesters

Instructions:

- a) The question paper contains three parts, Part-A, B, C and D.
- b) Part-A (1 mark questions), Part-B (2 marks questions), Part-C (4 marks questions) and Part-D (8 marks questions).
- c) Examination duration = 3 hours; Maximum marks = 50.

PART-A

Answer the following in a word, phrase or a sentence.

8×1=8

- R. 1. a
b
c
d
e
f
g
h

PART-B

Answer any FIVE of the following questions.

5×2=10

- Q. 2. a
b
c
d
e
f
g
h

PART-C

Answer Any FOUR of the following questions.

4×4=16

- Q. 3.
Q. 4.
Q. 5.
Q. 6.
Q. 7.
Q. 8.

PART-D

Answer Any TWO of the following questions.

2×8=16

Q. 09.

Q. 10.

Q. 11.

Q. 12.

NOTE: Question paper setting pattern (Instructions to question paper setters)

Part-A & B: Question no. 1 and 2: Minimum TWO questions shall be selected from each Unit.

Part-C: Minimum ONE question shall be selected from each Unit. Each Question carries 4 Marks.

Part-D: Minimum ONE question shall be selected from each Unit. Each question carries 8 Marks. Subdivisions, if required, should not exceed a) & b) with a marks distribution of 3+5 or 4+4.

KUVEMPU UNIVERSITY

Chemistry Syllabus for B.Sc. Course – 2016 (SEMESTER SCHEME)

(w.e.f. June - 2016)

FIRST SEMESTER

PAPER-I: CHEMISTRY - I

Total Hours: 60

UNIT - I: ANALYTICAL CHEMISTRY

Total Hours: 15

(Note: Numerical problems must be solved wherever necessary)

Chapter-1: Theory of Titrimetric Analysis

12 hours (16 marks weightage)

Introduction, principles of titrimetric analysis, requirement of titrimetric analysis, definition of equivalent weight, acidity, basicity, primary and secondary standards. Requirement of a primary standard solution, units of standard solutions (normality, molarity, molality, mole fraction, ppm). Classification of titrimetric analysis-Acid base titration: Types-explanation with titration curves, indicators used in acid base titrations, Ostwald's theory of acid-base indicator taking phenolphthalein and methyl orange as examples, choice of acid-base indicator.

Redox titration- theory of redox indicators with reference to diphenylamine, roll of o-phosphoric acid in redox titration,

Complexometric titrations-Definitions, metal indicators, principles and theory, types of EDTA titrations, estimation of Zn^{2+} using EDTA.

Iodometric titrations-principle, applications-estimation of copper, estimation of available chlorine in bleaching powder.

Chapter-2: Introduction to qualitative analysis of inorganic salts

3 hours (04 marks weightage)

Common ion effect, solubility products, principle. Application of common ion effect and solubility products, principle in qualitative analysis.

References:

1. Fundamental of Analytical Chemistry, D.A. Skoog, D.M. West, Holler and Crouch VIII Edition, 2005, Saunders College Publishing, New York.
2. Analytical Chemistry, G.D. Christian, V Ed., 2001 John Wiley & Sons, Inc, India.
3. Quantitative Analysis, R.A. Day and A.L. Underwood, VI Edition, 1993, Prentice Hall, Inc. New Delhi.
4. Vogel's Textbook of Quantitative Chemical Analysis, J. Mendham, R.C. Denney, J.D. Barnes and M.J.K. Thomas, VI Edition, Third Indian Reprint. 2003. Pearson Education Pvt. Ltd., New Delhi.
5. Analytical Chemistry Principles, John H. Kennedy, II Edition, Saunders College Publishing, California, 1990.

Chapter-1: Atomic structure**9 hours (12 marks weightage)**

Wave nature of electron-de Broglie equation. Heisenberg uncertainty principle. Schrodinger wave equation (no derivation). Significance of Ψ and Ψ^2 –atomic orbitals, Eigen values and eigen function, radial angular wave function and probability distribution curve for 1s,2s,2p,3s and 3p orbitals.

Quantum numbers and their significance. Shapes of s, p and d-orbitals and their nodal planes. Assigning of quantum number to a given electron in an atom (I and II period elements) in the periodic table. Energy level diagrams of polyelectron system, shielding or screening effect of inner shell electron on valence electron, factors affecting the magnitude of screening effect, effective nuclear charge, applications of effective nuclear charge, screening effect based on Slater's rule- problems to be solved.

Chapter-2: Periodic properties**6 hours (8 marks weightage)**

Ionization energy: Explanation, factors affecting the magnitude of ionization energy, variation of ionization energy in a group and period. Successive ionization energies, effect of ionic size and electronic configuration (III period), applications.

Electron affinity: Definition, factors affecting the magnitude of electron affinity, variation of electron affinity in a group and period, explanation for the observed trend, applications.

Electronegativity: Definition, explanation, factors influencing electronegativity variation in a group and period, explanation for the observed trend, Anomalies to be accounted, Pauling scale and Mulliken's scale of electronegativity (Problems to be solved), applications.

References:

1. Principles of Inorganic Chemistry (UGC Syllabus), B.R. Puri, L.R. Sharma, K.C. Kalia, Milestone Publishers, New Delhi, India, 2008.
2. Advanced Inorganic Chemistry by Gurudeep Raj and Chatwal Anand.
3. Modern Inorganic Chemistry by R.D. Madan.
4. Advanced Inorganic Chemistry by Sathyaprakash.
5. J. E. Huheey, E. A. Keiter and R. L. Keiter, Inorganic Chemistry: Principles of Structure and Reactivity, IV Edition, Pearson Education, India, 2006.
6. F. A. Cotton, G. Wilkinson, C. M. Murillo and M. Bochmann, Advanced Inorganic Chemistry, VI Edn, John Wiley and Sons, Inc., New York, 1999.

UNIT - III: ORGANIC CHEMISTRY

Total Hours: 15

Chapter-1: Structure and bonding in organic molecules. 4 hours (5 marks weightage)

Nature of chemical bonding, covalent, ionic, hydrogen bonding with examples. Orbit and orbital, shapes of s and p orbital's. Concept of hybridization in carbon atom. Shape, structure, bond length, bond angle, bond energies of methane and ethane, ethene and ethyne.

Chapter-2: Basic concepts in mechanism of organic reactions

5 hours (7 marks weightage)

Types of reactions: addition, elimination, substitution, rearrangement reactions with suitable examples. Types of reagents: electrophilic reagents, nucleophilic reagents. Electronic effects: inductive, electromeric, mesomeric, hyper conjugation. Resonance-rules for writing resonance. Arrow notation: curved arrow, single headed, double headed, and half headed arrow. Cleavage of bond- homolytic and heterolytic with example.

Reactive intermediates- formation, structure and stability of free radicals, carbocation, carbanion, carbene, nitrene with examples.

Chapter-3: Alkanes.

3 hours (4 marks weightage)

Nomenclature. Methods of preparation- Kolbe's synthesis, Corey-House synthesis, from Grignard reagents. Mechanism of chlorination of ethane.

Chapter-4: Cycloalkanes.

3 hours (4 marks weightage)

Nomenclature. Methods of preparation- Freund's method, Wisticeus method.

References:

1. Organic Chemistry, Bahl and Arun Bahl, S. Chand and Sons, New Delhi, 2005.
2. Organic Chemistry, R. T. Morrison and R. N. Boyd, VI Edition, Printice-Hall of India Limited, New Delhi, 1992.
3. Organic Chemistry, B. Y. Paula, III Edition, Pearson Education, Inc.(Singapore), New Delhi, reprint, 2002.
4. Textbook of Organic Chemistry, P S Kalsi, Mac Millan, 2000.

(Note: Numerical problems must be solved wherever necessary)

Chapter - 1: Mathematical Concepts in Chemistry (A brief review)

3 hours (3 marks weightage)

Logarithmic relations, Definitions: Some important relations like $\log (m \times n)$, $\log (m/n)$, \log (base changing), application in the calculation of pH . Differentiation of functions like e^x , x^n , $\sin x$, $\log x$; maxima and minima. partial differentiation. Exact & in-exact differentials. Examples from internal energy, enthalpy, Partial differentiation – explanation using $H = U + PV$ and $G = H - TS$., Integration – meaning and integrals of some important functions like x , dx , $1/x$, x^2 , x^n , $1/x$, $1/x^2$, $1/x^3$, \sqrt{x} , nx^2 , e^x , $\sin x$, $\cos x$, simple problems from I and II order kinetics. A brief introduction to Factorials and Probability, examples from atomic orbitals, wave functions and entropy.

Chapter-2: Gaseous State and Critical Phenomenon

5 hours (8 marks weightage)

Postulates of kinetic theory of gases, Qualitative discussion of the Maxwell's distribution of molecular velocities, collision number, mean free path and collision diameter. Calculation of root mean square velocity, average velocity and most probable velocity and relationship between them.

Critical Phenomenon: Critical temperature, Critical pressure, critical volume. PV isotherms of carbon dioxide, Derivation of van der Waal's equation of State, relationship between critical constants and van der Waal's constants. Reduced temperature, pressure and volume. Law of corresponding states.

Chapter-3: Liquid State and Solutions

7 hours (9 marks weightage)

Liquid State: Intermolecular forces (qualitative description). Structural differences between solids, liquids and gases.

Liquid Mixture: Review of Raoult's law, ideal and non-ideal solutions. Completely miscible liquids-Critical solution temperature, Effect of addition of salt on CST of phenol-water system. Immiscible liquids-Steam distillation and its applications.

Dilute solutions:- Review of colligative properties; Lowering of vapour pressure, elevation in boiling point, osmotic pressure, depression in freezing point and derivation of the relationship with molecular mass of non-volatile solute and elevation in boiling point. Determination of molecular mass of a solute by: (i) Beckmann's method (ΔT_f) and (ii) Walker-Lumsden method (ΔT_b). Berkeley-Hartley's method (π); (ii) Beckmann's method (ΔT_f) and (iii) Walker-Lumsden method.

References:

1. Applications of mathematics in Chemistry, Kishor Arora and Poonam Sinha.
2. Introductory Maths for Chemists, J. E. Parker.
3. Principles of Physical Chemistry: Puri, Sharma and Pathania, Vishal Publishing House.
4. Essential of Physical Chemistry; Arun Bahl, B.S. Bahi and G.D. Tuli, S. Chand and Co.
5. Physical Chemistry through Problems, S.K. Dogra.
6. Physical chemistry; R. L. Madan, G. D. Tuli, S. Chand & Co.
7. Elements of Physical Chemistry - Glasstone and Lewis - Macmillan.
8. Text book of Physical Chemistry - S. Glasstone- Macmillan (India) Ltd.
9. Numerical Problems on Physical Chemistry- Gashal, Books and Allied (P) Ltd.,
10. Physical Chemistry, P. C. Rakshit, V Edition (1988), Fourth Reprint (1997), Sarat Book House, Calcutta.
11. W. Kauzmann, Kinetic Theory of Gases (Thermal Properties of Matter, Vol I), Benjamin, Reading, MA, 1966.

SECOND SEMESTER

PAPER-II: CHEMISTRY - II

Total Hours: 60

UNIT - I: ANALYTICAL CHEMISTRY

Total Hours: 15

(Note: Numerical problems must be solved wherever necessary)

Chapter-1: Evaluation of Analytical Data

12 hours (16 marks weightage)

Role of analytical chemistry. Classification of analytical methods, types of instrumental, analytical methods on the basis of sample size. Errors- types of errors – determinate and indeterminate errors, accuracy and precision. Distribution of random errors- frequency distributions, normal error curve. Statistical treatment of finite samples. Measures of central tendency- mean, median, range, average deviation, relative average deviation, standard deviation. Accuracy and precision, significant figures, rounding off, determinate and indeterminate errors, ways of expressing accuracy, standard deviation, significant errors and propagation of errors, Gaussian distribution curve for error control charts, the confidence limit, test of significance, rejection of a result, Q. Test.

Chapter 2: Sampling methods

3 hours (04 marks weightage)

Sampling and sample handling, preparation of sample, sample storage, sampling techniques of solid, liquid and gaseous samples. Hazards in sampling.

List of Text books:

1. Fundamental of Analytical Chemistry, D.A. Skoog, D.M. West, Holler and Crouch VIII Edition, 2005, Saunders College Publishing, New York.
2. Analytical Chemistry, G.D. Christian, V Edition, 2001 John Wiley & Sons, Inc, India.
3. Quantitative Analysis, R.A. Day and A.L. Underwood, VI Edition, 1993 Prentice Hall, Inc. New Delhi.
4. Vogel's Textbook of Quantitative Chemical Analysis, J. Mendham, R.C. Denney, J.D. Barnes and M.J.K. Thomas, VI Edition, Third Indian Reprint, 2003, Pearson Education Pvt. Ltd., New Delhi.
5. Analytical Chemistry Principles, John H. Kennedy, II Edition, Saunders College Publishing, California, 1990.

UNIT - II: INORGANIC CHEMISTRY

Total Hours: 15

Chapter-1: Chemical bonding

6 hours (8 marks weightage)

Ionic bond: Definition, lattice energy, factors controlling lattice energy, Born-Haber cycle taking NaCl as example, Born-Landé equation (no derivation), significance of the equation, calculations of the lattice energy on the basis of Born-Landé equation, inter nuclear distance between oppositely charged ions, predictive power of thermochemical calculations on ionic compounds, Covalent character in predominantly ionic compounds, Conductivity in ionic solids, solubility of ionic solids and its dependence on lattice energy, polarization, polarizing power, polarizability of ions, variation of polarizing power of cations and anions along a period and down a group, Fajan's rule and its applications.

Chapter-2: Covalent Bond

4 hours (5 marks weightage)

Definition, factors favoring the formation of covalent compounds, VBT- formation of H₂ molecule- (taking Ψ wave functions of atomic orbitals) σ and π bonds with their characteristics, postulates of valence bond theory-electronegativity, polar and non-polar bonds, electronegativity differences, variation of percentage ionic character of the bond-Hanny and Smith equation (problems to be solved). Shapes of simple inorganic molecules and ions based on valence shell electron pair repulsion (VSEPR) theory to NH₃, SF₆, ClF₃ and H₂O.

Concept of hybridization, Rules for obtaining hybrid orbitals, extent of d-orbital participation in molecular bonding (SO₂, PCl₅, SO₃)

Chapter-3: Molecular orbital theory

5 hours (7 marks weightage)

LCAO method, symmetry of molecular orbitals, applications of MOT to homo and hetero-nuclear diatomic molecules, molecular orbital energy level diagrams for N₂, O₂, O₂⁺, O₂²⁻, CO, NO, CN⁻ (prediction of magnetic properties of these species)

References:

1. Principles of Inorganic Chemistry (UGC Syllabus), B.R. Puri, L.R. Sharma, K.C. Kalia, Milestone Publishers, New Delhi, India, 2008.
2. Advanced Inorganic Chemistry by Gurudeep Raj and Chatwal Anand.
3. Modern Inorganic Chemistry by R D Madan.
4. Advanced Inorganic Chemistry by Sathyaprakash.
5. J. E. Huheey, E. A. Keiter and R. L. Keiter, Inorganic Chemistry: Principles of Structure and Reactivity, IV Edition, Pearson Education, India, 2006.
6. F. A. Cotton, G. Wilkinson, C. M. Murillo and M. Bochmann, Advanced Inorganic Chemistry, VI Edition, John Wiley and Sons, Inc., New York, 1999.

UNIT - III: ORGANIC CHEMISTRY

Total Hours: 15

Chapter-1: Alkenes

5 hours (6 marks weightage)

Nomenclature. Methods of preparation- dehydration of alcohols, dehydrohalogenation of alkyl halides, partial hydrogenation of alkynes. Addition of HBr to propene - Markownikoff's rule-mechanism. Peroxide effect, mechanism. Reactions- oxidation with acidic KMnO_4 , lead tetra acetate, Bayer's reagent.

Dienes:

Nomenclature and classification of dienes. Preparation of butadiene from 1,4-diols, n-butane. Addition of HBr to butadiene with mechanism. Diel's-Alder reaction with mechanism.

Chapter-2: Alkynes

2 hours (3 marks weightage)

Nomenclature. Preparation from vicinal and gem dihalides. Alkylation of acetylene. Acidity of alkynes. Reactions with ammonical AgNO_3 , Cu_2Cl . Addition reaction: Addition of H_2O , mechanism of addition of HCl to ethyne.

Chapter-3: Arenes and aromaticity

2 hours (3 marks weightage)

Molecular orbital structure of benzene, Huckel's rule of aromaticity, anti aromatic, non-aromatic with example. Non-benzonoid aromatic compounds- cyclopentadienyl anion, cycloheptatrienylcation.

Chapter-4: Substitution and elimination reactions

6 hours (8 marks weightage)

- Aliphatic substitution reaction. S_N^1 , S_N^2 reactions with mechanism, stereochemistry and solvent effect.
- Aromatic substitution reactions. Nitration, bromination, sulphonation, Friedel-Craft alkylation and acylation with mechanism.
Orienting influence on aromatic substitution reaction. Ring activating and deactivating groups.
- E_1 , E_2 reaction with mechanism. Hoffmann elimination and Saytzeff reaction.

References:

- R. T. Morrison and R. N. Boyd, Organic Chemistry, VI Edition, Printice-Hall Of India Limited, New Delhi, 1992.
- B. Y. Paula, Organic Chemistry, III Edition, Pearson Education, Inc. (Singapore), New Delhi, reprint, 2002.
- Jerry March, Advanced Organic Chemistry, IV Edition, John Wiley & Sons, New York, 1992.
- Paula YurkanisBruice, Organic chemistry, III Edition, Pearson Education, Inc. (Singapore), New Delhi, reprint, 2002.
- E. S. Gould, Mechanism and Structure in Organic Chemistry, Halt, Rinhart & Winston, New York, 1964.
- Peter sykes, A Guide book to mechanism in Organic Chemistry, Pearson Education India
- P.S. Kalsi., Stereochemistry and mechanism through solved problems, New Age international publications.
- Organic Chemistry, Bahl and Arun Bahl,, S. Chand and Sons, New Delhi, 2005.

UNIT - IV: PHYSICAL CHEMISTRY

Total Hours: 15

(Note: Numerical problems must be solved wherever necessary)

Chapter-1: Solid State and Crystallography

6 hours (8 marks weightage)

Classification of solids – Isotropic and anisotropic crystals. Elements of symmetry – plane, axes and center of symmetry. Definition of unit cell & space lattice. Laws of crystallography: – (i) Law of constancy of interfacial angles (ii) Law of rationality of indices (iii) Law of symmetry. Representation of planes – Miller Indices, Weiss indices and its calculations using simple examples.

X-ray diffraction by crystals, derivation of Bragg's equation. Determination of crystal structure of NaCl. Liquid Crystals: difference between solids, liquids and liquid- crystals, types of liquid crystals, Classification of liquid crystals into Smectic and Nematic. Applications of Liquid Crystals.

Chapter-2: Ionic equilibria

3 hours (4 marks weightage)

Hydrolysis of salts of weak acids and weak bases. Ionic product of water. Degree of hydrolysis. Effect of temperature and dilution on degree of hydrolysis. pH of solutions. Common-ion effect, buffers, buffer action, Henderson's equation. Solubility product and ionic product in precipitation and in qualitative analysis.

Chapter-3: Phase Equilibria

6 hours (8 marks weightage)

Introduction to the terms: phase, component, degrees of freedom. Statement and derivation of Gibbs phase rule, phase equilibria of one component system, water and Sulphur system. Two component systems: KI-water system. Freezing mixture- definition, examples. Explanation for Congruent melting maximum, congruent melting minimum. Solid solutions – compound formation with congruent melting point (Mg-Zn) and incongruent melting point, (FeCl₃-H₂O) system.

References:

1. Physical chemistry; R. L. Madan, G. D. Tuli, S. Chand & Co.
2. Solid State Chemistry, D.K. Chakrabarty, New Age international.
3. Crystal Engineering: A Textbook, Gautam R. Desiraju, Jagadese J. Vittal, IISc Press
4. Solid State Chemistry and Its Applications, Anthony R. West, John Wiley & Sons.
5. Principles of Physical Chemistry: Puri, Sharma and Pathania, Vishal Publishing Co.
6. A Textbook of Physical Chemistry, Volume 2, K L Kapoor, Mc. Millan publishers India Limited.
7. Physical Chemistry, K. J. Laidler and J. M. Meiser, III Edition, Houghton Mifflin Comp., New, York, International Edition(1999).
8. Physical Chemistry, V Edition, G. M. Barrow, Tata McGraw Hill.
9. Physical Chemistry G. K. Vemulapalli, , Prentice-Hall India Pvt. Ltd.
10. Physical Chemistry, T.W. Atkins, Oxford University Press
11. Physical Chemistry - Walter J. Moore - Orient Longman.
12. Physical Chemistry, K. K. Padmanabha, Lakshmi Printing & Publishing House, Mysore.

THIRD SEMESTER

PAPER-III: CHEMISTRY - III

Total Hours: 60

UNIT - I: ANALYTICAL CHEMISTRY

Total Hours: 15

(Note: Numerical problems must be solved wherever necessary)

Solvent extraction

8 hours (12 marks weightage)

Definition, types, principle and efficiency of extraction, sequence of extraction process, factors affecting extraction-pH, oxidation state, modifiers, synergistic, masking and salting out agents, techniques-batch, continuous extraction and counter current extraction, applications.

Ultracentrifugation

5 hours (06 marks weightage)

Centrifugation, centrifugal force, sedimentation, centrifugal decantation, centrifuges, selection of centrifuge tubes, preparative, density gradient and isopycnic centrifugation. Analytical sedimentation, sedimentation coefficient, sedimentation velocity-Application of the technique in biological separation; membrane separation-principle and applications.

Ultrafiltration Zone refining techniques

2 hours (02 marks weightage)

Principles, instrumentation and applications.

References:

1. Introduction to Instrumental Analysis – R.D. Braun.
2. Instrumental method of chemical analysis – B.K. Sharma, Goel publishing House, Meerut.
3. Instrumental method of analysis – Willard, merit and Dean, VII Edition .
4. Analytical Chemistry- Gray D. Christian, V edition John Wiley and Sons, Inc.
5. Instrumental Methods of Chemical Analysis- B.K. Sharma, Goel publishing House, Meerut'
6. J. E. Huheey, E. A. Keiter and R. L. Keiter, Inorganic Chemistry: Principles of Structure and Reactivity, IV Edition, Pearson Education, India.
7. Vogel's Textbook of Quantitative Chemical Analysis, J. Mendham, R.C. Denney, J.D. Barnes and M.J.K. Thomas, VI Edition.

UNIT - II: INORGANIC CHEMISTRY

Total Hours: 15

Chapter-1: Glass, Cement and paints

4 hours (6 marks weightage)

Glass : Raw materials, manufacture by tank furnace method, colouring agents, annealing of glass, types of glass – soda glass, potash glass, flint glass, pyrex glass (their composition and uses).

Cement: Raw materials, manufacture by dry process, mechanism of setting. Role of water and gypsum in setting process.

Paints: Constituents and their functions, manufacture of white lead by chamber's process and electrolytic process

Chapter-2: p-block elements

5 hours (7 marks weightage)

BF_3 - Preparation, properties, electron acceptor character, applications.

Hydrides of Boron; Diborane - Preparation, properties, structure and bonding and uses.

Borazine - Preparation, properties, structure and uses.,

Carbon and silicon – Structural features of diamond and graphite, CO_2 and SiO_2 – Correlation of their properties with structure.

Fullerenes- Introduction, preparation, properties and uses.

Silicates – Types, structure, ultramarine and zeolites

Chapter-3: d-block and f-block elements

6 hours (7 marks weightage)

d-Block elements: Electronic configuration, general characteristics of transition elements, oxidation states, atomic size, ionization potential, colour, complex formation, magnetic properties and acidic & basic properties of oxides- explanation with reference to 3d-series.

f-Block elements: Lanthanide series-Definition, electronic configuration, oxidation states, colour, complex formation and magnetic properties, lanthanide contraction, its causes and consequences, separation of lanthanides by ion-exchange method, applications of lanthanides.

References:

1. Principles of Inorganic Chemistry (UGC Syllabus), B.R. Puri, L.R. Sharma, K.C. Kalia, Milestone Publishers, New Delhi, India, 2008.
2. Advanced Inorganic Chemistry by Gurudeep Raj and Chatwal Anand
3. Modern Inorganic Chemistry by R D Madan
4. Advanced Inorganic Chemistry by Sathyaprakash.
5. J. E. Huheey, E. A. Keiter and R. L. Keiter, Inorganic Chemistry: Principles of Structure and Reactivity, IV Edition, Pearson Education, India, 2006.
6. F. A. Cotton, G. Wilkinson, C. M. Murillo and M. Bochmann, Advanced Inorganic Chemistry, VI Edition, John Wiley and Sons, Inc., New York, 1999.

UNIT - III: ORGANIC CHEMISTRY

Total Hours: 15

Chapter-1: Alcohols

7 hours (9 marks weightage)

Monohydric alcohol- Classification, nomenclature, preparation from alky halides, aldehydes, ketones. Distinguish test between 1^o, 2^o, 3^o by Victor-Meyer method. Lucas method. Test for hydroxyl alcohol- formation of alkoxide, esterification with mechanism, oxidation.

Dihydric alcohol- Nomenclature, preparation of glycol from alkene. oxidative cleavage using lead tetra acetate, periodic acid. Uses of ethylene glycol. Pinacol - Pinacolone rearrangement with mechanism.

Trihydric alcohol- Nomenclature. manufacture of glycol from Spent lye. Synthesis from propene. Reactions of glycol with oxalic acid at different temperatures, reaction with PCl₅, with fatty acids.

Uses of glycerol, preparation of nitroglycerine, composition and uses of Cordite and dynamite.

Chapter-2: Phenols

6 hours (8 marks weightage)

Classification, nomenclature, Methods of preparation from Cumene, Dow process, from diazonium salts.

Acidity of phenols- resonance, stabilization of phenoxide ion, compare the acidity of alcohol and phenol. Effect of substituent's on acidity of phenols, electron withdrawing groups (-NO₂, -Cl, -CN, -CHO, -COOH), electron donating groups (-CH₃, -OCH₃, -NH₂).

Reactions of phenols. Fries, Claisen, Reimerr-Tiemann, Leader-Manase reactions with mechanism.

Synthesis of phenolphthalein, salicylaldehyde, vanillin, o-benzoquinone.

Chapter-3: Ethers and epoxides

2 hours (3 marks weightage)

Chemical reactions of ethers- Cleavage and auto-oxidation. Ziesel's method.

Synthesis of epoxides: acid and base catalyzed ring opening reaction, reactions of epoxides with Grignard and organolithium reagents.

References:

1. I. L. Finar, Organic Chemistry, ELBS Longmann, Vol. I & II, 1984.
2. B.S. Bahl and Arun Bahl, Organic Chemistry, S. Chand and Sons, New Delhi, 2005.
3. R. K. Bansal, Organic Reaction Mechanism, Wiley Eastern Limited, New Delhi, 1993.
4. J. March, Advanced Organic Chemistry, Wiley Interscience, 1994.
5. E. S. Gould, Mechanism and Structure in Organic Chemistry, Halt, Rinhart & Winston, New York, 964.
6. Peter Sykes, A Guide book to mechanism in Organic Chemistry., Pearson Education India.
7. F. A. Carey and Sundberg, Advanced Organic Chemistry – Part A & B, III Edition, Plenum Press, New York, 1990.
8. S. K. Ghosh, Advanced General Organic Chemistry, Book and Allied (P) Ltd, 1998.

(Note: Numerical problems must be solved wherever necessary)

Chapter-1: Chemical Kinetics and Catalysis**8 hours (11 marks weightage)**

Review of terms – Rate, Order and Molecularity, comparison between rate order and molecularity. Derivation of expression for the rate constant of a second order reaction with $a = b$ and $a \neq b$. Arrhenius equation, concept of activation energy. Theories of reaction rates: collision theory, transition state theory. Steady state approximation and Lindemann's hypothesis. Experimental determination of kinetics of inversion of cane sugar by polarimetric method.

Catalysis: Types of Catalysis; Homogeneous, Heterogeneous Catalysis, characteristics of catalytic reactions. Brief discussion on theories of Catalysis: The Intermediate Compound Formation Theory, The Adsorption Theory. Enzyme Catalysis: Mechanism of Enzyme Catalysis; Michaelis - Menten equation.

Chapter-2: Electrochemistry-I:**7 hours (9 marks weightage)**

Electrolytes, electrolytic conductance. Debye-Huckel theory of strong electrolytes; asymmetry effect and electrophoretic effect. Debye-Huckel-Onsager's equation for strong electrolytes (elementary treatment only), Transport number, definition and determination by Hittorf's method.

Kohlrausch's law; its applications: determination of degree of dissociation, determination of equilibrium constants of weak electrolytes, determination of solubility product of sparingly soluble salt. Conductometric titrations: Strong acid v/s strong base, weak acid v/s strong base, mixture of acid vs. strong base.

References:

1. Physical chemistry; R. L. Madan, G. D. Tuli, S. Chand & Co.
2. Principles of Physical Chemistry: Puri, Sharma and Pathania, Vishal Publishing Co.
3. A Textbook of Physical Chemistry, Volume 2, K L Kapoor, Mc. Millan publishers India Limited.
4. Chemical Kinetics and Reaction Dynamics, Upadhyay, Santosh K.
5. A Textbook of Physical Chemistry, A. S. Negi, New age
6. Chemical Kinetics, K.J. Laidler, III Edition, Pearson Education Pvt. Ltd., New Delhi,
7. An Introduction to Chemical Kinetics, Margaret Robson Wright, John Wiley.
8. Kinetics and Chemical Reactions, S. K. Jain, Vishal Publishing Co.
9. Electrochemistry, B.K. Sharma , Krishna Prakashan Media (p) Ltd,
10. An Introduction to Electrochemistry, Samuel Glasstone, Litton Educational Publishing, Inc., New York.
11. Physical Chemistry, K. J. Laidler and J. M. Meiser, III Edition, Houghton Mifflin Comp., New, York, International Edition.
12. Industrial Electrochemistry, D. Pletcher and F.C. Walsh, Chapman and Hall, II Edition, 1984.
13. Engineering chemistry, Jain and Jain, Dhanpal and sons.
14. Physical Chemistry, T.W. Atkins, Oxford University Press.
15. Physical Chemistry, K. K. Padmanabha, Lakshmi Printing & Publishing House, Mysore.

FOURTH SEMESTER

PAPER-IV: CHEMISTRY - IV

Total Hours: 60

UNIT - I: ANALYTICAL CHEMISTRY

Total Hours: 15

(Note: Numerical problems must be solved wherever necessary)

Chapter-1: Chromatography

5 hours (8 marks weightage)

General description of chromatography- classification, chromatograms, migration rates of solutes, retention time, capacity factor, selectivity factor, band broadening and column efficiency, plate theory and rate theory. Theory of band broadening, van-Deemter's equation, column resolution, factors influencing resolution.

Chapter-2: Planar Chromatography

4 hours (4 marks weightage)

Paper and thin layer chromatography, stationary and mobile phase, various techniques of development, visualization and evolution of chromatograms, applications.

Chapter-3: Gas Chromatography

4 hours (5 marks weightage)

Introduction and overview of GSC and GLC: Instrumentation, sample injection systems, columns, detectors- TCD, FID, β -ray ionization detectors, temperature programming, applications- quantitative and qualitative analysis.

Chapter-4: HPLC

2 hours (3 marks weightage)

Introduction, superiority of HPLC, instrumentation and applications,

References:

1. Vogel's Text book of Quantitative Chemical Analysis- Revised by G. H. Jaffery, J. Bassett, J. Mendham and R. C. Denny ELBS, V Edition (1996)
2. Introduction to Instrumental Analysis – R.D. Braun 1986.
3. Instrumental method of chemical analysis – B.K. Sharma, Goel publishing House, Meerut 2000.
4. Instrumental method of analysis – Willard, merit and Dean, VII Edition 1998.
5. Analytical Chemistry- Gray D. Christian, V Edition John Wiley and Sons, Inc.
6. Instrumental Methods of Chemical Analysis- B.K. Sharma, Goel publishing House, Meerut, 2000.
7. Quantitative Chemical Analysis- D. C. Harris, W. M. Freeman and Co., NY, USA, IVED, 1995

UNIT - II: INORGANIC CHEMISTRY

Total Hours: 15

Chapter-1: Metallurgy

9 hours (13 marks weightage)

Thermodynamics of metallurgy, Ellingham's diagrams- features, applications and limitations, extraction of lead - self-reduction process and nickel from pentlandite, extraction of manganese from pyrolusite from allumino thermite process extraction of gold by hydrometallurgical process, refining of gold by quartation process, beryllium from beryl via sodium beryllium fluoride, Thorium from Monazite sand and Uranium from Pitch blende by acid digestion process.

Chapter-2: Solvents

6 hours (7 marks weightage)

Classification, comparative account of water and liquid ammonia as solvents (striking similarities and factors which make them good polar solvents). Reactions in liquid ammonia and water, acid-base neutralisation, oxidation-reduction, complex formation, ionisation of acetic acid. Solvolysis, solvation, Solubility of ionic solids – its dependence of lattice energy and solvation energy. Solutions of alkali metals in liquid ammonia, advantages and disadvantages of liquid NH_3 as solvents.

References:

1. Principles of Inorganic Chemistry (UGC Syllabus), B.R. Puri, L.R. Sharma, K.C. Kalia, Milestone Publishers, New Delhi, India, 2008.
2. Advanced Inorganic Chemistry by Gurudeep Raj and Chatwal Anand.
3. Modern Inorganic Chemistry by P L Sony.
4. A text book of Industrial Chemistry by B K Sharma.

UNIT - III: ORGANIC CHEMISTRY

Total Hours: 15

Chapter-1: Aldehydes and Ketones

5 hours (7 marks weightage)

Nomenclature. Structure and reactivity of carbonyl groups in aldehydes, ketones. Methods of preparation of chloral, acrolein, crotonaldehyde.

Reactions of aldehydes and ketones with hydroxyl amine, hydrogen cyanide, 2,4-DNP. Reaction Mechanism of Aldol, Perkin's, Benzoin, Cannizaro, Knoevenagel reaction. Clemmenson reduction, Wolff-Kishner reduction.

Chapter-2: Carboxylic acids

4 hours (6 marks weightage)

Nomenclature of mono and dicarboxylic acids. Acidity of carboxylic acids. Effect of substituents on acidity. Comparative study of:

- (i) Acetic acid and formic acid.
- (ii) Acetic acid and benzoic acid.
- (iii) Acetic acid and monochloro acetic acid.
- (iv) 2-chloro butanoic acid and chlorobutanoic acid.

Hydroxy acid, effect of heat on α , β and γ – hydroxy acids.

Derivatives of Carboxylic acids: Preparation and reactions of (i) acid chlorides, (ii) acid amides, (iii) acid anhydrides.

Chapter-3: Amines

3 hours (4 marks weightage)

Nomenclature, Classification with examples. Synthesis of amines by reduction of nitro compounds. Hoffmann's degradation methods with mechanism. Basicity of amines. Comparative study of:

- (i) Methyl amine, dimethyl amine and trimethyl amine.
- (ii) Methyl amine and aniline.
- (iii) Aniline and p-nitroaniline and p-toluidine.
- (iv) Aniline, N-methyl aniline and N, N-dimethyl aniline.

Separation of amines by alkylation, nitrous acid method and Heinsberg's method.

Chapter-4: Organosulphur compounds

3 hours (3 marks weightage)

Aromatic sulphonic compounds- thio alcohols, nomenclature and general chemical properties, sulphonal and thioethers. Aromatic sulphonic acids- Nomenclature, general methods of preparations, general chemical properties. Reactions due to SO_3H group and benzene ring.

Synthesis of Saccharin, Chloramine-T and Dichloramine-T.

References:

1. S.H. Pine, Organic Chemistry, 5th Edition, Mcgraw Hill International Edition, Chemistry Series, New York, 1987.
2. I. L. Finar, Organic Chemistry, VI Edition, ELBS, 1990.
3. Bahl and Arun Bahl, Organic Chemistry, S. Chand and Sons, New Delhi, 2005.
4. Arun Bahl and B.S. Bahl, Advanced Organic Chemistry, S. Chand.
5. V. K. Ahluwalia, Textbook of Organic Chemistry, Viva Books Private Limited, 2012.
6. S. K. Ghosh, Advanced General Organic Chemistry, Book and Allied (P) Ltd, 1998.

(Note: Numerical problems must be solved wherever necessary)

Chapter-1: Electrochemistry-II**6 hours (8 marks weightage)**

Definition of EMF of a cell, standard electrode potential, IUPAC sign convention; Types of reversible electrodes with examples: gas-metal ion, metal-ion, metal insoluble salt-anion electrode, Redox electrode with examples – Quinhydrone electrode (To be mentioned). Reference electrodes – Construction and working of SHE and calomel electrode. Concentration cell – Derivation of EMF using Nernst equation for electrolytic concentration cell without transference. Liquid junction potentials, elimination of liquid junction potential. Potentiometric titration involving only redox systems ($K_2Cr_2O_7$ vs. FAS).

Chapter-2: Photochemistry**5 hours (7 marks weightage)**

Laws of photochemistry- Grothus-Draper's law and Stark-Einstein's law of photochemical equivalence. Quantum yield and explanation for Photochemical reactions of hydrogen-iodine, hydrogen-chlorine and hydrogen-bromine. Qualitative description of fluorescence, phosphorescence, non-radiative processes (internal conversion, inter-system crossing), Jablonski diagram. Photosensitized reactions - simple examples, chemiluminescence, bioluminescence.

Chapter-3: Colloids**4 hours (5 marks weightage)**

Definition of colloids, classification of colloids; Lyophilic and Lyophobic Colloids. Solids in liquids (sols): properties – kinetic, optical and electrical; stability of colloids, protective action, Hardy—Schulze law, gold number. Liquids in liquids (emulsions): types of emulsions, preparation, Emulsifier. Liquids in solids (gels): preparation and properties, association colloids (micelles). General application of colloids.

References:

1. Physical chemistry; R. L. Madan, G. D. Tuli, S. Chand & Co.
2. Principles of Physical Chemistry: Puri, Sharma and Pathania, Vishal Publishing Co.
3. Textbook of Physical Chemistry, Gurdeep Raj, Goel Publications
4. Elements of Physical Chemistry, B.R. Puri, L.R. Sharma, M.S. Pathania, I Edition, Vishal Publishing House, Jalandhar, India, 2013.
5. Electrochemistry, B.K. Sharma, Krishna Prakashan Media (p) Ltd,
6. An Introduction to Electrochemistry, Samuel Glasstone, Litton Educational Publishing, Inc., New York.
7. Physical Chemistry, K. J. Laidler and J. M. Meiser, III Edition, Houghton Mifflin Comp., New, York, International Edition.
8. Industrial Electrochemistry, D. Pletcher and F.C. Walsh, Chapman and Hall, II Edition, 1984.
9. Photochemistry, Gurdeep Raj, Goel Publications.
10. Photochemistry, J. G. Calvert and J. N. Pitts, Wiley, New York.
11. Fundamentals of Photochemistry, K. K. Rohatgi - Mukherjee, New Age International Pub., Reprint 2006.
12. Molecular Energy Transfer, R. Levine and J. Jortner, eds., J. Wiley, New York.
13. A Textbook of Physical Chemistry, Volume 2, K L Kapoor, Mc. Millan publishers India Limited.
14. Physical Chemistry, T.W. Atkins, Oxford University Press.
15. Physical Chemistry, K.K. Padmanabha, Lakshmi Printing & Publishing House, Mysore.

FIFTH SEMESTER

PAPER-V: CHEMISTRY - V

Total Hours: 45

UNIT - I: ANALYTICAL CHEMISTRY

Total Hours: 15

(Note: Numerical problems must be solved wherever necessary)

Chapter-1: Gravimetry

7 hours (13 marks weightage)

General principles, condition for precipitations, choice of precipitation, advantages of using organic precipitants, factors influencing the solubility of the precipitate, theories of precipitation, co-precipitation, post-precipitation, effect of digestion, PFHS, pH change, ion releasing reagents, change in oxidation states (taking Fe, Cu and Al as examples), use of mixed solvents and analytical applications

Chapter-2: UV-Visible spectroscopy

4 hours (7 marks weightage)

Range, frequency and energy of UV radiations, interaction of UV radiation with organic molecules, types of transitions, allowed and non-allowed transitions, Concept of chromophores and auxochromes, bathochromic shift and hypso chromic shift, hyper chromic effect and hypo chromic effect.

Comparison of λ_{\max} organic compounds taking following examples giving reasons

1. CH_3CHO and $\text{C}_6\text{H}_5\text{CHO}$
2. Ethylene and 1,3-butadiene
3. Cis and transstilbene
4. Cis-trans cinnamic acid

Chapter-3: IR spectroscopy

4 hours (7 marks weightage)

Range, frequency and energy of IR radiations, interaction of IR radiation with organic molecules, molecular vibrations – stretching and bending vibrations, Hook's law, finger print region, Stretching frequency of functional groups in benzaldehyde, acetophenone, ethyl acetate, aniline and methyl amine.

References:

1. Vogel's Text book of Quantitative Chemical Analysis- Revised by, G. H. Jaffery, J. Bassett, J. Mendham and R. C. Denney, ELBS V Edition (1989), John Wiley and Sons. Inc. New York.
2. Introduction to Instrumental Analysis – R.D. Braun 1986.
3. Instrumental method of chemical analysis – B.K. Sharma, Goel publishing House, Meerut 2000.
4. Instrumental method of analysis – Willard, merit and Dean, VII Edition, 1998.
5. Analytical Chemistry- Gray D. Christian, V Edition, John Wiley and Sons, Inc.
6. Instrumental Methods of Chemical Analysis-B.K. Sharma, Goel publishing House, Meerut, 2000.
7. Quantitative Chemical Analysis- D. C. Harris, W. M. Freeman and Co., NY, USA, IV Edition, 1995.

Chapter-1: Electroplating**10 hours (18 marks weightage)**

Theory, purpose of electroplating, nature of good deposit, factors influencing electroplating (concentration of metal ion, pH, temperature, current density), electroplating of chromium and gold.

Ceramics-Raw materials and their role, varieties of clay, production of ceramic ware, glazing insulators.

Refractories-Classification, properties, hardness, pyrometric cone equivalent values.

Abrasives- Classification, properties, hardness of abrasives, Moh's scale, manufacture and importance of carborundum.

Chapter-2: Alloys**5 hours (9 marks weightage)**

Definition, purpose of making alloys, preparation of alloys by electro deposition method and powder metallurgy method, advantages of powder metallurgy, influence of carbon, manganese, nickel, chromium, tungsten, silicon and cobalt on the properties of steel, heat treatment of steel, hardening, tempering and annealing, case hardening of steel-carbiding and nitriding.

References:

1. Advanced Inorganic Chemistry, V Edition, F.A. Cotton and G. Wilkinson; John Willey and sons, 1988.
2. Inorganic Chemistry; Principles of structure and reactivity, III Edition, James E Huheey, Ellen E. Keither and Richard L. Keither, Harper Collins college Pub., 1983.
3. Inorganic Chemistry 3rd ed., Shriver and Atkins, Oxford University Press, 1999.
4. Organometallic Chemistry, A Unified approach R.C. Mehrotra and A. Singh. Willey Eastern, New Delhi.
5. A text book of Industrial Chemistry by B.K. Sharma
6. A concise Inorganic Chemistry, J .D. Lee, ELBS Ed., 1991
7. Modern aspects of Inorganic Chemistry, H. J. Emeleus and A. G. Sharpe, ELBS.
8. Theoretical Principles of Inorganic Chemistry, IV ed., G. S. Manku, Tata, McGraw Hill, 1990

UNIT - III: ORGANIC CHEMISTRY

Total Hours: 15

Chapter-1: Purification of organic compounds

4 hours (7 marks weightage)

Methods for purification of solids- crystallization, fractional crystallization and sublimation. Methods for purification of liquids- Distillation, Fractional distillation, distillation under reduced pressure, steam distillation. Criteria of purity- Melting point and boiling point.

Chapter-2: Heterocyclic compounds

4 hours (7 marks weightage)

Preparation and reactions of pyrrole, furan, thiophene, pyridine, pyrimidine, indole, quinoline, isoquinoline. Aromaticity of pyrrole, furan, thiophene. Basicity of pyrrole and pyridine.

Chapter-3: Dyes

3 hours (5 marks weightage)

Classification of dyes with example. Chromophore theory, Modern theory. Synthesis of, Congo Red, Malachite Green, Methyl Orange and Indigo. Structural elucidation and synthesis of Alizarin.

Chapter-4: Polymer Chemistry

4 hours (7 marks weightage)

Classification of polymers-Types of polymerization, Mechanism of Free radical and ionic polymerization. Examples for addition polymers and condensation polymers. Zeigler-Natta catalyst. Thermoplastics and thermosetting plastics. Synthesis of Styrene, Teflon, Nylon-6, Nylon-6,6, Bakelite, PVC, polythene and Natural rubber.

References:

1. Arun Bahl and B.S. Bahl, Advanced Organic Chemistry, S. Chand.
2. Paula Yurkanis Bruice, Organic chemistry, III Edition, Pearson Education, Inc. (Singapore), New Delhi, reprint, 2002.
3. Gurdeep Chatwal, Chemistry of Organic Natural Products, Vol 1 and 2, Goel Pub. House, 2002.
4. R. K. Bansal, Heterocyclic Chemistry.
5. S. H. Pine, Organic Chemistry, 5th Edition, Mcgraw Hill International Edition, Chemistry Series, New York, 1987.
6. Bill Meyer Text Book of Polymer Science, F.W. Jr. John Wiley & Sons 1984.
7. Gowarikar. V.R. Viswanathan, N.V. Jayadev Sreedhar. "Polymer Science".
8. Sharma. B.K., Polymer Chemistry, Goel Publishing House, Meerut- 1989.
9. Arora M.G. Vadar M.S., Polymer Chemistry. Anmol Publications Pvt. Ltd., New Delhi 1989.

FIFTH SEMESTER

PAPER-VI: CHEMISTRY - VI

Total Hours: 45

UNIT - I: PHYSICAL CHEMISTRY

Total Hours: 15

(Note: Numerical problems must be solved wherever necessary)

Chapter- 1: Thermodynamics - I

8 hours (14 marks weightage)

Review of the thermodynamics terms; system, surroundings etc, types of systems, state and path functions. Work done in isothermal expansion and compression of an ideal gas. Heat capacity of a gas at constant pressure and constant volume: relationship between C_p and C_v . Derivation of Kirchoff's equation. Limitations of I law of thermodynamics with illustrations. Need for II-law of thermodynamics, different ways of stating II-law with respect to heat and spontaneity. Heat engine - Carnot's cycle and derivation of the expression for its efficiency. II-law in terms of efficiency (η). Concept of entropy and its physical significance. Entropy changes in reversible isothermal process. Entropy changes of an ideal gas in different processes; entropy of mixing, standard entropies. Free energy: Gibbs function (G) and Helmholtz function (A) as thermodynamic quantities. Variation of G and A with pressure, volume and temperature.

Chapter-2: Fundamentals of Molecular Spectroscopy

7 hours (13 marks weightage)

Electromagnetic radiation and its interaction with matter, regions of the EM spectrum, Origin of molecular spectra: Born-Oppenheimer approximation. Types of molecular spectra-rotation, vibration, electronic, Raman (to be mentioned).

Electronic spectroscopy: Qualitative description of electronic transition in σ , π and n molecular orbitals and their energy levels, selection rules and Franck-Condon principle.

Raman Spectroscopy:

Concept of Polarizability. Raman spectra, Stokes and anti Stokes lines, selection rules. Instrumentation. Applications of Raman spectroscopy, comparison of Raman and IR spectroscopies.

References:

1. Physical chemistry; R. L. Madan, G. D. Tuli, S. Chand & Co.
2. Principles of Physical Chemistry: Puri, Sharma and Pathania, Vishal Publishing Co.
3. Textbook of Physical Chemistry, Gurdeep Raj, Goel Publications House, New Delhi.
4. Elements of Physical Chemistry, B.R. Puri, L.R. Sharma, M.S. Pathania, I Edition, Vishal Publishing House, Jalandhar, India, 2013.
5. Molecular Structure and Spectroscopy, Aruldas, Printice Hall, India Pvt. Ltd.
6. A Textbook of Physical Chemistry, Volume 2, K.L. Kapoor, McMillan Publishers, India Limited.
7. Physical Chemistry, K. J. Laidler and J. M. Meiser, III Edition, Houghton Mifflin Comp., New, York, International Edition.
8. Molecular Energy Transfer, R. Levine and J. Jortner, eds., J. Wiley, New York.
9. A Textbook of Physical Chemistry, Volume 2, K L Kapoor, McMillan McMillan Publishers, India Limited.

10. Physical Chemistry, T.W. Atkins, Oxford University Press.
11. Physical Chemistry – A Molecular Approach, Donald A. McQuarrie, John D. Simon, III Edition (Viva Student Edition), Viva Books Pvt. Ltd., New Delhi.
12. Thermodynamics, Kinetic Theory, and Statistical Thermodynamics, Francis W. Sears Gerhard L. Salinger, III Edition, Narosa Publishing House, New Delhi.
13. Principles of Physical Chemistry, S. H. Maron, C. F. Prutton, Mc. Milan.
14. J. D. Lambert, Vibrational and Rotational Relaxation in Gases, Oxford University Press, Oxford, 1977.
15. Advanced Physical Chemistry, D. N. Bajpai, S. Chand & Co.

(Note: Numerical problems must be solved wherever necessary)

Chapter-1: Microwave spectroscopy**4 hours (6 marks weightage)**

Spectrum of electromagnetic radiations, interaction of electromagnetic radiations with molecules, quantisation of different forms of energies in molecules. Condition for energy absorption by molecules (emissions and absorption spectrum). Spectroscopic terms, classification, types of molecules, (microwave active and microwave inactive), Linear molecules, spherical top molecules, symmetric top molecules, asymmetric top molecules. Applications of Microwave spectroscopy

Chapter-2: NMR Spectroscopy**6 hours (12 marks weightage)**

Introduction to NMR spectroscopy: instrumentation, theory and types of NMR active nuclides. Relaxation process - Spin-Spin relaxation, Spin-lattice relaxation, number of signals, shielding and deshielding effects, influencing chemical shifts. [Inductive effect, van der Waal's deshielding, anisotropic effects, hydrogen bonding]

Solvents used, spectra of CH_3OH , $\text{C}_2\text{H}_5\text{OH}$, and $\text{C}_6\text{H}_5\text{CH}_3$, peak area and proton counting, splitting of the signals (Pascal's triangle), spin-spin coupling, splitting signal by proton. Calculating the ratio in the heights of the signals. Applications of NMR spectroscopy.

Chapter-3: Mass Spectroscopy**5 hours (9 marks weightage)**

Basic principles- Theory of mass spectroscopy, instrumentation, mass spectrum, the molecular ion peak, determination of molecular formula, Mc-Lafferty rearrangement. Metastable ion peaks and their importance. Nitrogen rule. General transformation modes. Homolytic cleavage-heterolytic cleavage. Retro-Deil's Alder reactions. Important features of mass spectra of hydrocarbons - alkanes, alkenes and cycloalkenes.

References:

1. Fundamental of Analytical Chemistry, D.A. Skoog, D.M. West, Holler and Crouch VIII Edition, 2005, Saunders College Publishing, New York.
2. Analytical Chemistry, G.D. Christian, V Edition, 2001 John Wiley & Sons, Inc, India.
3. Quantitative Analysis, R.A. Day and A.L. Underwood, VI Edition, 1993 prentice Hall, Inc. New Delhi.
4. Vogel's Textbook of Quantitative Chemical Analysis, J. Mendham, R.C. Denney, J.D. Barnes and M.J.K. Thomas, VI Edition.
5. Analytical Chemistry Principles, John H. Kennedy, II Edition, Saunders College Publishing, California, 1990.
6. Instrumental Methods of Analysis by H.H. Willard, L.L. Merritt and J.A. Dean, VII Edition, CBS Publishers, New Delhi, 1988.
7. Principles and Practice of Analytical Chemistry, F. W. Fifeild and Kealey III Edition, 2000, Blackwell Sci., Ltd. Malden, USA.
8. Modern Analytical Chemistry, David Harvey, McGraw Hill, New Delhi, 2000.
9. Introduction to Instrumental Analysis, Braun, Pharm. Med. Press. India.

UNIT - III: INORGANIC CHEMISTRY

Total Hours: 15

Chapter-1: Co-ordination Chemistry

10 hours (18 marks weightage)

Double salts, complex salts, definition of terms-complex ion, ligand, co-ordination number, co-ordination sphere. Types of ligands with example-monodentate, bidentate, polydentate, Ambidentate and macro cyclic ligands (crown ethers, porphyrins).

Methods of detection of complex formation- conductivity, pH, colour, EAN rule for Stabilising of Complexs. Nomenclature of complex compounds. Isomerism in complex compounds: a) Structural isomerism-Ionization isomerism, hydrate isomerism, linkage isomerism and co-ordinate isomerism, b) Optical and geometrical isomerism in complex compounds with co-ordination number 4 and 6.

Stability of complex compounds- Stepwise stability constant, overall formation constant, factors influencing the stability of complexes-Nature of metal ion, nature of ligands, chelation and macrocyclic effects. Applications of complex formation in (a) Metallurgy (in the extraction of nickel and gold) (b) Qualitative and quantitative analysis.

Valence Bond Theory (VBT)

Valence bond theory as applied to complexes- inner and outer orbital complexes. The structure and geometry of the following complexes to be discussed:

1. $[\text{Fe}(\text{CN})_6]^{2-}$
2. $[\text{Fe}(\text{H}_2\text{O})_6]^{2+}$
3. $[\text{MnCl}_4]^{2-}$
4. $[\text{Ni}(\text{CO})_4]^{2-}$
5. $[\text{Cu}(\text{NH}_3)_4]^{2+}$

Modification of VBT :Electroneutrality principle of $[\text{Be}(\text{H}_2\text{O})]^{2+}$ and back bonding effect with respect to $[\text{Ni}(\text{CO})_4]^{2-}$.

Crystal Field Theory (CFT)

Splitting of d-orbitals in octahedral and tetrahedral fields, effect of weak and strong field ligands, spectrochemical series of ligands, crystal field stabilization energy and calculation of CFSE for different systems.

Chapter-2: Metal Carbonyls

5 hours (08 marks weightage)

Definition, Preparation of chromium, iron, Manganese, Cobalt carbonyls, stability of carbonyls based on 18 electron rule, Structure and bonding of $\text{Cr}(\text{CO})_6$, $\text{Fe}(\text{CO})_5$, $\text{Mn}_2(\text{CO})_{10}$, Uses of metal Carbonyls

References:

1. Principles of Inorganic Chemistry (UGC Syllabus), B.R. Puri, L.R. Sharma, K.C. Kalia, Milestone Publishers, New Delhi, India, 2008.
2. Advanced inorganic Chemistry by Gurudeep Raj and ChatwalAnand
3. Modern Inorganic Chemistry by R D Madan
4. Advanced inorganic Chemistry by Sathyaprakash ,Vol-2

SIXTH SEMESTER

PAPER-VII: CHEMISTRY - VII

Total Hours: 45

UNIT - I: ORGANIC CHEMISTRY

Total Hours: 15

Chapter - 1: Stereochemistry of organic compounds **9 hours (17 marks weightage)**

Concept of isomerism, Optical isomerism, elements of symmetry, molecular chirality. Enantiomers, properties of enantiomers, optical isomerism in Lactic acid and tartaric acid. R and S notations. Optical activity due to helicity.

Diastereomers. Threo and erythrodiastereomers. Racemisation, resolution of racemic modifications (chemical and biological methods), Walden inversion, asymmetric synthesis.

Geometrical isomerism: Geometric isomerism in maleic acid and fumaric acid. Determination of their configurations. E and Z notations. Geometrical isomerism of oximes, Determination of configuration of oximes. Beckmann rearrangement. Conformational isomers of ethane, 1,2-dichloroethane and cyclohexane.

Chapter-2: Drugs **3 hours (5 marks weightage)**

Classification of drugs. Synthesis of aspirin, paracetamol, tetracyclin. Use of chloroquin.

Chapter-3: Retrosynthesis **3 hours (5 marks weightage)**

Retrosynthesis of benzocaine, 4-methoxy acetophenone, saccharin. Disconnection approach. General terms: synthon, synthetic equivalents and target molecule. General guidelines for disconnection.

References:

1. I. L. Finar, Organic Chemistry, ELBS Longmann, Vol. I & II, 1984.
2. Alex V. Ramani, Leo A. Stanley, C. Mani, Stereochemistry, MJP Publishers.
3. Introduction to stereochemistry – K. Mislow.
4. R. K. Bansal, Organic Reaction Mechanism, Wiley Eastern Limited, New Delhi, 1993.
5. J. March, Advanced Organic Chemistry, Wiley Interscience, 1994.
6. E. S. Gould, Mechanism and Structure in Organic Chemistry, Halt, Rinhart & Winston, New York, 1964.
7. Peter Sykes, A Guide book to mechanism in Organic Chemistry, Pearson Education India.
8. P.S. Kalsi, Stereochemistry and mechanism through solved problems, New Age International Publications.
9. Stuart Warren, Paul Wyatt, Organic Synthesis: The Disconnection Approach, John Wiley & Sons.
10. F. A. Carey and Sundberg, Advanced Organic Chemistry – Part A & B, III Edition, Plenum Press, New York, 1990.
11. D. Nasipuri, Stereochemistry of Organic Compounds, II Edition, Wiley Eastern Limited, New Delhi, 1991.
12. S. K. Ghosh, Advanced General Organic Chemistry, Book and Allied (P) Ltd, 1998.

(Note: Numerical problems must be solved wherever necessary)

Chapter - 1: Physical Properties and Chemical Constitution**6 hours (10 marks weightage)**

Additive properties, constitutive properties, additive-constitutive properties (definitions). Polarization: Induced, orientation and molar polarization. Clausius - Mossotti equation. Dipole moment and structure of molecules - planar and non-planar, differentiating between cis and trans isomers. Parachor: meaning and its use in determining chemical constitution and molecular structure. Molar refraction and its application in elucidating molecular structure. Brief account of magnetic properties - paramagnetic, diamagnetic and ferromagnetic systems. Magnetic susceptibility and its importance.

Chapter-2: Nanomaterials and Polymers**4 hours (8 marks weightage)**

Nanomaterials: General characteristics, a brief and elementary account of synthetic methods; bottom-up method, top-down method, examples (detailed mechanism is not required), general applications of nanomaterials.

Polymers: Definition, classification, degree of polymerization, expressions for number average and weight average molecular weights. Determination of molar mass of polymers by viscosity method (Ostwald's viscometric method).

Chapter-3: Surface and Interfacial Chemistry**5 hours (9 marks weightage)**

Adsorption; types of adsorption and adsorption isotherms, Solid-liquid interfaces: Gibbs adsorption isotherm (expression only). Solid-gas interfaces. – Langmuir isotherm (derivation), Temkin and BET isotherm (expression only). Determination of surface concentration of adsorbents using BET isotherm. Kinetics of enzymatic reactions: Michaelis-Menten equation, effect of temperature and pH.

References:

1. Physical chemistry; R. L. Madan, G. D. Tuli, S. Chand & Co.
2. Principles of Physical Chemistry: Puri, Sharma and Pathania, Vishal Publishing House, Jalandhar, India, 2014.
3. Textbook of Physical Chemistry, Gurdeep Raj, Goel Publications
4. Elements of Physical Chemistry, B.R. Puri, L.R. Sharma, M.S. Pathania, I Edition, Vishal Publishing House, Jalandhar, India, 2013.
5. A Textbook of Physical Chemistry, Volume 2, K L Kapoor, Mc.Millan Publishers India Limited.
6. Physical Chemistry, T.W. Atkins, Oxford University Press.
7. Physical Chemistry – A Molecular Approach, Donald A. McQuarrie, John D. Simon, III Edition (Viva Student Edition), Viva Books Pvt. Ltd., New Delhi.
8. Principles of Physical Chemistry, S. H. Maron, C. F. Prutton, Mc.Millan Publishers India Limited.
9. Electrochemistry, B.K. Sharma, Krishna Prakashan Media (p) Ltd.
10. An Introduction to Electrochemistry, Samuel Glasstone, Litton Educational Publishing, Inc., New York.

11. New Directions in Solid State Chemistry, C.N.R.Rao, J. Gopalakrishna, Cambridge University Press.
12. Introduction to nanoscience, Gabor L. Hornyak, Joydeep Dutta, Harry F.Tibbals, Anil K. Rao, CRC Press.
13. Nanotechnology, S.Shanmugam, MJP Publishers, Chennai (2010).
14. A Handbook on Nanochemistry, Patrick Salomon, Dominant Publishers and Distributers, New Delhi.
15. Nanotechnology: Importance and applications, M.H. Fulekar, IK International.
16. Supramolecular chemistry- Concepts and Perspectives, J.M. Lehn, Wiley-VCH.
17. Physical Chemistry, K. K. Padmanabha, Lakshmi Printing & Publishing House, Mysore.

UNIT - III: ANALYTICAL CHEMISTRY

Total Hours: 15

(Note: Numerical problems must be solved wherever necessary)

Chapter-1: Radio Chemical Methods of Analysis **8 hours (10 marks weightage)**

Radiation dose, G-value primary and secondary processes, radiolysis of water vapour, Dosimeter-Fricke dosimeter and ceric sulphate dosimeter, Introduction, nature of radioactivity, radiometric units, detection and measurement of radioactivity, disintegration, rate of disintegration, radioactive traces, tracer techniques, applications in analytical chemistry, isotopic dilution analysis, activation analysis, radiometric analysis and applications.

Chapter-2: Thermal methods of analysis **4 hours (10 marks weightage)**

Introduction, thermogravimetric analysis (TGA), types of thermogravimetric analysis, principle and method. Automatic thermogravimetric analysis, instrumentation, types of recording thermobalances, Introduction, instrumentation and application of DSC and DTA.

Chapter-3: Kinetic methods of analysis **3 hours (6 marks weightage)**

Kinetics- the basics, Enzyme Catalysis properties of enzymes, enzyme inhibitors and activators, some examples of enzyme analysis.

References:

1. Vogel's Text book of Quantitative Chemical Analysis- Revised by G. H. Jaffery, J. Bassett, J. Mendham and R. C. Denny ELBS, V Edition (1996).
2. Introduction to Instrumental Analysis – R.D. Braun 1986.
3. Instrumental method of chemical analysis – B.K. Sharma, Goel publishing House, Meerut 2000.
4. Instrumental method of analysis – Willard, merit and Dean, VII Edition 1998.
5. Analytical Chemistry- Gray D. Christian, V Edition John Wiley and Sons, Inc.
6. Instrumental Methods of Chemical Analysis-B.K.Sharma, Goel publishing House, Meerut, 2000.
7. Quantitative Chemical Analysis- D. C. Harris, W. M. Freeman and Co., NY, USA, IVED, 1995.

SIXTH SEMESTER

PAPER-VIII: CHEMISTRY - VIII

Total Hours: 45

UNIT - I: INORGANIC CHEMISTRY

Total Hours: 15

Chapter-1: Inorganic polymers

5 hours (9 marks weightage)

Silicones: Types, preparation (Linear, branched and cyclic), properties and applications. Fluorocarbons: Definition, examples, properties, manufacture of Teflon and uses. Phosphazenes: Preparation, properties and nature of bonding in triphosphazenes. S-N ring compounds (S_4N_4 and S_2N_2): Preparation, properties and uses.

Chapter-2

3 hours (5 marks weightage)

Organometallic Compounds

Definition, Classification, Based on Hapticity and Based on Group, 18 electron rule, Structure of ferrocene and Chromocene.

Chapter-3: Bio-inorganic Chemistry

7 hours (13 marks weightage)

Elements in biological systems- metals and nonmetals, bulk metals and trace metals. Iron: Co-ordination environment in Haeme, Role of haemoglobin in oxygen transportation. Zinc: Zinc containing metalloenzymes- role of carbonic anhydrase and carboxy peptidase. Magnesium: Co-ordination environment in chlorophyll, skeletal structure of chlorophyll, role of chlorophyll in photosynthesis. Cobalt: Vitamin B_{12} , Molybdenum: Nitrogenase.

References:

1. Principles of Inorganic Chemistry (UGC Syllabus), B.R. Puri, L.R. Sharma, K.C. Kalia, Milestone Publishers, New Delhi, India, 2008.
2. Advanced Inorganic Chemistry by Gurudeep Raj and Chatwal Anand.
3. Modern Inorganic Chemistry by P L Sony.
4. A text book of Industrial Chemistry by B K Sharma.
5. A text book of Bioinorganic chemistry by Hussain Reddy.

UNIT - II: ORGANIC CHEMISTRY

Total Hours: 15

Chemistry of Natural products.

Chapter-1: Carbohydrates

5 hours (8 marks weightage)

Classification and nomenclature of carbohydrates. Monosaccharides- Mechanism of formation of osazone from glucose and fructose. Inter-conversion of glucose and fructose. Chain lengthening and chain shortening of aldoses, configuration of glucose and fructose. Epimerization (conversion of glucose into mannose). Formation of glycosides. Determination of ring size of D(+) glucose. Elucidation of cyclic structure of D(+) glucose. Constitution of D(+) Fructose. Determination of ring size of D(-) Fructose (six membered ring). Mechanism of mutarotation.

Disaccharides- Elucidation of structure of maltose and sucrose. Polysaccharides- Structure of starch and cellulose.

Chapter-2: Amino acids and proteins**4 hours (7 marks weightage)**

Definitions and classification of amino acids, synthesis of amino acids by Gabriel phthalimide, malonic ester and Strecker's method of synthesis.

Properties and reactions- Zwitter ion and isoelectric points. Ninhydrin and Biuret tests.

Peptides: peptide bond, carbobenzoxy method of synthesis of peptides.

Proteins: Classification based on composition and structure: primary and secondary structures of proteins. Denaturation of proteins.

Chapter-3: Alkaloids**2 hours (4 marks weightage)**

Definition, method of isolation, structural elucidation of nicotine and its synthesis by Spath process. Structure and uses of atropine and cocaine.

Chapter-4: Terpenes**2 hours (4 marks weightage)**

Classification and isolation. isoprene rule, structure of menthol, camphor, geraniol, α -terpineol and zingiberene. Structural elucidation of citral and its synthesis from methyl heptenone.

Chapter-5: Enzymes and nucleic acids**2 hours (4 marks weightage)**

Classification, active site, factors affecting activity of enzymes with explanation. Mechanism of enzyme catalysis (chymotrypsin as example).

Synthesis of nucleosides and nucleotides. Hydrogen bonding in DNA.

References:

1. O. P. Agarwal, Chemistry of Organic Natural Products, Vol 1 and 2, Goel Pub. House, 2002.
2. Gurdeep Chatwal, Chemistry of Organic Natural Products, Vol 1 and 2, Goel Pub. House, 2002.
3. Bahl and Arun Bahl, Advanced Organic Chemistry, S. Chand and Sons, New Delhi, 2005.
4. Lubert Stryer, Biochemistry, W. H. Freeman and company, New York, 1975.
5. Robert L. Caret, Katherine J. Denniston, Joseph J. Topping, Principles and Applications of organic and biological chemistry, WBB publishers, USA, 1993.
6. J. L. Jain, Biochemistry, Sultan Chand and Co. 1999
7. A. Mazur and B. Harrow, Text book of Biochemistry, 10th Edition, W.B. Saunders Co., Philadelphia, 1971.
8. Paula Yurkanis Bruice, Organic Chemistry, III Edition, Pearson Education, Inc. (Singapore), New Delhi, reprint, 2002.

(Note: Numerical problems must be solved wherever necessary)

Chapter-1: Thermodynamics-II: 6 hours (10 marks weightage)

Clausius-Clapeyron equation (derivation) and its applications. Nernst heat theorem; statement and concept of residual entropy, evaluation of absolute entropy. Third law of thermodynamics. Partial molar quantities; Concept of chemical potential, variation of chemical potential with temperature and pressure, derivation of Gibbs-Duhem equation, Duhem-Margules equation and its application.

Chapter-2: Elementary Quantum Mechanics 4 hours (7 marks weightage)

Physical interpretation of the wave function. Postulates of quantum mechanics, Schrödinger wave equation based on the postulates of quantum mechanics and its importance. Eigen values and Eigen functions, Hamiltonian operator. Application of Schrödinger equation to Particle in a one dimensional box (derivation).

Chapter-3: Statistical Thermodynamics 5 hours (9 marks weightage)

Energy states: macro and microstates, Limitation of classical thermodynamics, Distinguish between classical mechanics and statistical mechanics. Sterling approximation, derivation of Maxwell-Boltzmann statistics, statistical interpretation of entropy, application of statistics to gases-monoatomic ideal gas (No derivations). Partition functions and thermodynamic parameters, expressions for translational, rotational, vibrational and electronic partition functions, enthalpy, energy, Gibbs free energy.

References:

1. Physical chemistry; R. L. Madan, G. D. Tuli, S. Chand & Co.
2. Principles of Physical Chemistry: Puri, Sharma and Pathania, Vishal Publishing Co.
3. A Textbook of Physical Chemistry, Volume 2, K L Kapoor, Mc. Millan publishers India Limited.
4. A Textbook of Physical Chemistry, A. S. Negi, New age
5. Physical Chemistry, K. J. Laidler and J. M. Meiser, III Edition, Houghton Mifflin Comp., New, York, International Edition.
6. Industrial Electrochemistry, D. Pletcher and F.C. Walsh, Chapman and Hall, II Edition, 1984.
7. Physical Chemistry, T.W. Atkins, Oxford University Press
8. Advanced Physical Chemistry, D. N. Bajpai, S. Chand & Co.
9. Quantum Chemistry, R.K. Prasad, 4th Edition, New Age International Publishers, New Delhi.
10. Quantum Mechanics for Chemists, David O. Hayward, The Royal Society of Chemistry, UK.
11. Quantum Chemistry, John P. Lowe, Kirk A. Peterson, III Edition, Academic Press, London, UK.
12. Quantum Chemistry, Donald A. McQuarrie, I Indian Edition, Viva Books Pvt. Ltd., New Delhi.
13. Quantum Chemistry, Ira N. Levine, V Edition, Pearson Education Pvt. Ltd., New Delhi.

KUVEMPU UNIVERSITY

PRACTICALS FOR B.Sc. COURSE (CHEMISTRY)- 2016

FIRST SEMESTER - PRACTICALS (3 HOURS PER WEEK)

PAPER - I: VOLUMETRIC ANALYSIS

1. Calibration of pipette, burette, standard flask (100mL).
2. Preparation of standard solution of Sodium carbonate, standardization of HCl and estimation of NaOH.
3. Preparation of standard solution of potassium biphthalate, standardization of sodium hydroxide solution and estimation of HCl/H₂SO₄.
4. Preparation of standard solution of oxalic acid, standardization of KMnO₄ solution and estimation of Mohr's salt solution.
5. Preparation of standard Mohr's salt solution, standardization of K₂Cr₂O₇ and estimation of Ferric chloride solution (diphenylamine indicator).
6. Preparation of standard solution of ZnSO₄, standardization of EDTA and estimation of hardness of water.
7. Preparation of standard solution of K₂Cr₂O₇, standardization of sodium thiosulphate solution and estimation of copper in copper sulphate solution.
8. Estimation of available chlorine in bleaching powder.
9. Determination of acetic acid in commercial vinegar using NaOH.
10. Determination of alkali content – antacid tablet using HCl.
11. Estimation of calcium content in a sample Eg., chalk as calcium oxalate.

Note: A minimum of EIGHT experiments must be performed and recorded.

SECOND SEMESTER - PRACTICALS (3 HOURS PER WEEK)

PAPER - II: Inorganic Qualitative Analysis

Systematic Semi-Micro Inorganic Qualitative Analysis of a salt mixture containing Two Cations and Two Anions.

The following radicals may be given:

BASIC RADICALS: (from amongst) Pb^{2+} , Bi^{3+} , Cd^{2+} , Al^{3+} , Zn^{2+} , Mn^{2+} , Ba^{2+} , Sr^{2+} , Ca^{2+} , Mg^{2+} , Na^+ , K^+ , and NH_4^+ .

ACID RADICALS: (from amongst) CO_3^{2-} , HCO_3^- , SO_3^{2-} , S^{2-} , NO_2^- , F^- , Cl^- , Br^- , I^- , NO_3^- , SO_4^{2-} , BO_3^{3-} , PO_4^{3-} .

Experiment A: Preliminary Tests for acid and basic radicals in given samples.

Experiment B: Wet tests for Acid and Basic radicals in given samples.

Experiment C: Confirmatory tests.

Note:

1. At least 10 unknown samples are to be analyzed by each student during the laboratory session.
2. The students have to write the equation and proper explanation wherever necessary.

THIRD SEMESTER - PRACTICALS (3 HOURS PER WEEK)

PAPER – III: Organic Qualitative Analysis

Qualitative analysis of Organic compounds [Monofunctional group]

The following compounds may be given:

1. Urea
2. Oxalic acid
3. Aniline
4. o-Cresol
5. Benzoic acid
6. Benzaldehyde
7. Acetophenone
8. Chlorobenzene
9. Benzamide
10. Nitrobenzene
11. Toluene

Note: A minimum of EIGHT experiments must be performed and recorded.

Chemical equations have to be discussed for all tests.

FOURTH SEMESTER – PRACTICALS (3 HOURS PER WEEK)

PAPER – IV: Chemistry Practicals - IV

1. Determination of density using specific gravity bottle and viscosity of the given liquid by using Ostwald's viscometer.
2. Determination of density and surface tension of the given liquid by drop weight method using stalagmometer.
3. Determination of molecular weight of non volatile solute by Walker-Lumsden method.
4. Determination of percentage of given electrolyte in phenol water system by miscibility temperature method.
5. Determination of percentage of given binary mixture (Glycerol-water) by viscosity method.
6. Determination of rate constant of Fe^{3+} catalyzed decomposition of H_2O_2 .
7. Determination of rate constant of saponification of ethyl acetate.
8. Determination of critical solution temperature of phenol water system.
9. Determination of transition temperature of given hydrate salt ($\text{Na}_2\text{S}_2\text{O}_3 \cdot 5\text{H}_2\text{O}$).
10. Identification of the given amino acid by paper chromatography.
11. Determination of rate constant of inversion of cane sugar by polarimeter method.

Note: A minimum of EIGHT experiments must be performed and recorded.

FIFTH SEMESTER - PRACTICALS (3 HOURS PER WEEK)

PAPER – V: Gravimetric Analysis

1. Estimation of Barium (from barium chloride solution) as Barium sulphate.
2. Estimation of Iron (from Mohr's salt solution) as Iron oxide.
3. Estimation of Aluminium (from potash alum solution) as Aluminium oxide.
4. Estimation of Nickel (from Nickel ammonium sulphate solution) as Nickel dimethylglyoximate.
5. Estimation of Copper (from copper sulphate solution) as Cuprous thiocyanate.
6. Estimation of Zinc (from zinc sulphate solution) as Zinc oxinate..
7. Estimation of sulphate (from barium chloride solution) as Barium sulphate.
8. Estimation of Magnesium (from magnesium sulphate solution) as **Magnesium oxinate.**

Note: All the above experiments must be performed and recorded.

V SEMESTER – PRACTICALS (3 HOURS PER WEEK)

PAPER – VI: Organic preparation and estimation

Part-A: Preparation

1. Preparation of acetanilide from aniline.
2. Preparation of m-dinitro benzene from nitrobenzene. (Example for nitration reaction)
3. Preparation of benzoic acid from benzaldehyde. (Example for oxidation reaction)
4. Preparation of p-bromo acetanilide from acetanilide. (Example for bromination reaction)
5. Preparation of azo dye from aniline. (Example for coupling reaction)

Note: A minimum of FOUR experiments must be performed and recorded.

Part-B: Estimation

1. Determination of Phenol.
2. Determination of Aniline.
3. Determination of Glycine.
4. Determination of Citric acid.
5. Determination of Amide.

Note: A minimum of FOUR experiments must be performed and recorded.

SIXTH SEMESTER - PRACTICALS (3 HOURS PER WEEK)

PAPER – VII: Chemistry Practicals - VII

Part-A

1. Determination of percentage composition of a binary mixture of organic liquids by using Abbe's Refractometer
2. Determination of rate constant of inversion of cane sugar by Polarimeter.
3. Determination of cell constant (0.1N KCl solution to be prepared by students) and determine the equivalent conductance of the given electrolyte solution by using conductivity bridge.
4. Determination of cell constant (0.1N KCl solution to be prepared by students) and determine the equivalent conductance at infinite dilution for weak electrolyte of given solution.
5. Potentiometric titration of Mohr's salt solution v/s Potassium dichromate/Potassium permanganate solution
6. Potentiometric titration of Hydrochloric acid v/s Sodium hydroxide.

Note: A minimum of FOUR experiments must be performed and recorded.

Part-B

1. Conductometric titration of Sodium hydroxide vs Hydrochloric acid
2. Conductometric titration of Mixture of weak acid and strong acid vs Sodium hydroxide.
3. Determine the pH of mixture of acetic acid and sodium acetate at different concentrations and determination of dissociation constant of acid by using pH meter.
4. Estimation of Cu(II) in the given solution by colorimetric method.
5. Estimation of Fe(III) in the given solution by colorimetric method.
6. Conductometric titration of tertiary mixture of CuSO_4 + Acetic acid + HCl using NaOH solution.

Note: A minimum of FOUR experiments must be performed and recorded.

SIXTH SEMESTER – PRACTICALS (3 HOURS PER WEEK)

PAPER – VIII: Inorganic Complex Preparation and Estimation

Part - A: Preparation and estimation

1. Preparation of chloropentamminecobalt(III) chloride.
2. Preparation of nitropentamine cobalt(III) chloride
3. Preparation of tetraamminecopper(II) sulphate.
4. Preparation of potassium trisoxalatoferate(III) hydrate.
5. Preparation of trithiourea zinc(II) complex.
6. Preparation of Hexamminenickel(II)chloride complex.

Note: A minimum of FOUR experiments must be performed and recorded.

Part - B: Ore Analysis

1. Estimation of calcium carbonate in limestone by oxalate method.
2. Estimation of amount of iron present in haematite ore.
3. Estimation of MnO_2 present in the given pyrolusite ore.
4. Estimation of amount of nitrite present in sodium nitrite ore solution.
5. Estimation of amount of magnesium present in gypsum ore.
6. Estimation of amount of chromium present in chromite ore.

Note: A minimum of FOUR experiments must be performed and recorded.



Board of Studies in Commerce



NEW EDUCATION POLICY (NEP) 2020

**CURRICULUM FRAMEWORK FOR B.COM (REGULAR)
COURSE-FIRST AND SECOND YEAR**

COURSE STRUCTURE

FIRST SEMESTER

CODE NO	SUBJECT	TEACHING HOURS
DSC 1.1	FINANCIAL ACCOUNTING	4
DSC1.2	MANAGEMENT PRINCIPLES AND APPLICATIONS	4
DSC1.3	PRINCIPLES OF MARKETING	4
OE 1.5	ACCOUNTING FOR EVERYONE	3
OE 1.5	FINANCIAL LITERACY	3

SECOND SEMESTER

CODE NO	SUBJECT	TEACHING HOURS
DSC 2.1	ADVANCED FINANCIAL ACCOUNTING	4
DSC2.2	BUSINESS MATHEMATICS/CORPORATE ADMINISTRATION	4
DSC 2.3	LAW & PRACTICE OF BANKING	4
OE 2.6	FINANCIAL ENVIRONMENT	3
OE 2.6	INVESTING IN STOCK MARKETS	3

THIRD SEMESTER

CODE NO	SUBJECT	TEACHING HOURS
DSC 3.1	CORPORATE ACCOUNTING	4
DSC3.2	BUSINESS STATISTICS	4
DSC3.3	COST ACCOUNTING	4
DSC3.4	CORPORATE GOVERNANCE	3
OE 3.5	BUSINESS ETHICS	3

FOURTH SEMESTER

CODE NO	SUBJECT	TEACHING HOURS
DSC 4.1	ADVANCED CORPORATE ACCOUNTING	4
DSC4.2	COSTING METHODS AND TECHNIQUES	4
DSC4.3	BUSINESS REGULATORY FRAMEWORK	4
OE 4.6	ENTREPRENEURSHIP SKILLS	3
OE 4.6	ADVERTISING SKILLS	3

FIRST SEMESTER

- **Financial Accounting**
- **Management Principles and Applications**
- **Principles of Marketing**
- **Accounting for Everyone (OE)**

OR

Financial Literacy

Name of the Program: Bachelor of Commerce (B.Com.)

Course Code: B.Com. 1.1

Name of the Course: Financial Accounting

Course Credits	No. of Hours per Week	Total No. of Teaching Hours
4 Credits	4 Hrs	56 Hrs

Pedagogy: Classrooms lecture, tutorials, Group discussion, Seminar, Case studies & field work etc.,

Course Outcomes: On successful completion of the course, the Students will be able to

- Understand the theoretical framework of accounting as well accounting standards.
- Demonstrate the preparation of financial statement of manufacturing and non-manufacturing entities of sole proprietors.
- Exercise the accounting treatments for consignment transactions & events in the books of consignor and consignee.
- Understand the accounting treatment for royalty transactions & articulate the Royalty agreements.
- Outline the emerging trends in the field of accounting.

Syllabus:

Module No. 1: Theoretical Framework of Accounting **Hours** **10**

Introduction-Meaning and Scope of Accounting- Accounting Terminologies- Uses and Users of Accounting information-Accounting Process-Basis of Accounting: Cash and Accrual basis-Branches of Accounting-Accounting Principles-Concepts and Conventions-Accounting Standards-Indian Accounting Standards (IND AS).

Module No. 2: Financial Statements of Sole Proprietors **Hours** **12**

Introduction-Meaning of Sole Proprietor-Financial Statements of Non-Manufacturing Entities: Trading Account-Income Statement/Profit & Loss Account-Balance Sheet; Financial Statements of Manufacturing Entities: Manufacturing Account-Trading Account-Profit & Loss account- Balance Sheet.

Module No. 3: Consignment Accounts **Hours** **12**

Introduction-Meaning of Consignment-Consignment vs Sales-Pro-forma Invoice-Accounts Sales-Types Commission-Accounting for Consignment Transactions & Events in the books of Consignor and Consignee - Treatment of Normal & Abnormal Loss. -Valuation of Closing Stock-Goods sent at Cost Price and Invoice Price.

Module No. 4: Royalty Accounts **Hours** **14**

Introduction-Meaning-Types of Royalty-Technical Terms: Lessee, Lessor, Minimum Rent – Short Workings –Recoupment of Short Working–Accounting Treatment in the books of Lessee and lessor – Journal Entries and Ledger Accounts including minimum rent account.

Module No. 5: Emerging Trends in Accounting **Hours** **08**

Digital Transformation of Accounting-Big Data Analytics in Accounting-Cloud Computing in accounting- Accounting with drones- Forensic Accounting- Accounting for Planet-- Creative Accounting-Outsourced Accounting- Predictive Accounting (Theory Only).

Skill Developments Activities:

- Collect Annual Reports of sole proprietors and identify accounting concepts and conventions followed in the preparation of the annual reports.
- Collect Annual Reports of sole proprietors and identify the different components.
- Preparation of Proforma invoice and accounts sales with imaginary figures.
- Collect Royalty Agreements and draft dummy royalty agreements with imaginary figures.

5. Identify latest innovations and developments in the field of accounting.
6. Any other activities, which are relevant to the course.

Text Books:

1. ICAI Study Materials on Principles & Practice of Accounting, Accounting and Advanced Accounting.
2. SP Iyengar (2005), Advanced Accounting, Sultan Chand & Sons, Vol. 1.
3. Robert N Anthony, David Hawkins, Kenneth A. Merchant, (2017) Accounting: Text and Cases, McGraw-Hill Education, 13th Edition.
4. Charles T. Horngren and Donna Philbrick, (2013) Introduction to Financial Accounting, Pearson Education, 11th Edition.
5. J.R. Monga, Financial Accounting: Concepts and Applications. Mayur Paper Backs, New Delhi, 32nd Edition.
6. S.N. Maheshwari, and. S. K. Maheshwari. Financial Accounting. Vikas Publishing House, New Delhi, 6th Edition.
7. B.S. Raman (2008), Financial Accounting Vol. I & II, United Publishers & Distributors
8. Compendium of Statements and Standards of Accounting. The Institute of Chartered Accountants of India, New Delhi.

Note: Latest edition of text books may be used.

Name of the Program: Bachelor of Commerce (B.Com.)

Course Code: B.Com. 1.2

Name of the Course: Management Principles and Applications

Course Credits	No. of Hours per Week	Total No. of Teaching Hours
4 Credits	4 Hrs	56 Hrs

Pedagogy: Classrooms lecture, Case studies, Group discussion, Seminar & field work etc.,

Course Outcomes: On successful completion of the course, the Students will be able to

- Understand and identify the different theories of organisations, which are relevant in the present context.
- Design and demonstrate the strategic plan for the attainment of organisational goals.
- Differentiate the different types of authority and chose the best one in the present context.
- Compare and chose the different types of motivation factors and leadership styles.
- Choose the best controlling techniques for better productivity of an organisation.

Syllabus:	Hours
Module No. 1: Introduction to Management	12
Introduction-Meaning and Definitions, Nature and importance of Management, Scope of Management, Levels of Management, Administration V/S Management, Functions of Management, Evolution of Management thought: Contributions of F W Taylor and Henry Fayol.	
Module No. 2: Planning	10
Introduction, Meaning and Definitions, Characteristics and Importance of Planning, Types of planning, Steps in Planning, Importance and Limitations of Strategic Planning; Environmental Analysis: Meaning and importance; Decision-making: Concept, Importance and Process of decision making.	
Module No. 3: Organizing	12
Introduction, Meaning and Definitions, Principles of Organizing, Process of Organizing, Types of Organisation, Formal V/S Informal Organization; Types of Organizational Structure, Departmentation, Authority and Delegation of Authority, Types of Authority, Span of Management and Decentralization	
Module No. 4: Staffing and Leading	12
Staffing: Meaning and Process of Staffing-Staffing Process; Motivation: Meaning and Importance of motivation, Major Motivation theories: Maslow's Need- Hierarchy Theory, Herzberg's Two-factor Theory and Vroom's Expectation Theory; Leadership: Concept and Importance of Leadership, Styles of Leadership; Communication: Meaning and Importance of Communication, Barriers to communication, Overcoming barriers to communication.	
Module No. 5: Controlling and Coordination	12
Control: Meaning and Definitions, Importance of Controlling, Steps in Controlling, Limitations of Controlling, Principles of Effective Control, Major Techniques of control: Budgetary control, PERT, CPM and JIT; Coordination: Meaning and Definitions, Nature and Importance of Coordination, Principles of Coordination.	

Skill Development Activities:

1. Collect the photographs and bio-data of any three leading contributors of management thoughts.
2. Visit any business organisation and collect the information on types of planning adopted by them.
3. Visit any business organisation and collect different types of authority followed and also the draw the organizational structure.
4. Analyse the leadership styles of any select five companies of different sectors.
5. Visit any manufacturing firm and identify the controlling system followed.
6. Any other activities, which are relevant to the course.

Text Books:

1. Harold Koontz and Heinz Weihrich (2017), Essentials of Management: An International and Leadership Perspective, McGraw Hill Education, 10th Edition.
2. Stephen P Robbins and Madhushree Nanda Agrawal (2009), Fundamentals of Management: Essential Concepts and Applications, Pearson Education, 6th Edition.
3. James H. Donnelly, (1990) Fundamentals of Management, Pearson Education, 7th Edition.
4. B.P. Singh and A.K.Singh (2002), Essentials of Management, Excel Books
5. P C Tripathi & P N Reddy (2005), Principles of Management, TMH Publications, 3rd Edition.
6. Koontz Harold (2004), Essentials of Management, Tata McGraw Hill.

Note: Latest edition of text books may be used.

Name of the Program: Bachelor of Commerce (B.Com.)

Course Code: B.Com. 1.3

Name of the Course: Principles of Marketing

Course Credits	No. of Hours per Week	Total No. of Teaching Hours
4 Credits	4 Hrs	56 Hrs

Pedagogy: Classrooms lecture, Case studies, Group discussion, Seminar & field work etc.,

Course Outcomes: On successful completion of the course, the Students will be able to

- Understand the basic concepts of marketing and assess the marketing environment.
- Analyse the consumer behaviour in the present scenario and marketing segmentation.
- Discover the new product development & identify the factors affecting the price of a product in the present context.
- Judge the impact of promotional techniques on the customers & importance of channels of distribution.
- Outline the recent developments in the field of marketing.

Syllabus:

Hours

Module No. 1: Introduction to Marketing

12

Introduction, Nature, Importance and functions of Marketing, Concepts and Approaches of Marketing, Selling vs Marketing, Marketing Environment: Concept, Importance and Components of marketing environment: Marketing Management: Meaning and Importance, Marketing Mix: Concept and Components.

Module No. 2: Consumer Behaviour & Market segmentation

12

Consumer Behaviour: Nature and Importance, Consumer buying decision process, Factors influencing consumer buying behavior; Consumerism: Meaning & Elements; **Market Segmentation:** Concept, Importance and Bases of segmentation; Positioning: Concept, Importance and bases.

Module No. 3: Product and Pricing

12

Product: Meaning, Importance, Classification of products, Concept of product mix, Product-Support Services, PLC: Meaning and stages of product life-cycle; Stages of New Product Development; Concept of Branding, Packaging and Labeling; **Pricing:** Meaning and significance. Factors affecting price of a product, Pricing methods and strategies.

Module No. 4: Promotion and Distribution

12

Promotion Nature and Importance of promotion; Types of promotion, Concept and types of Advertising, Sales promotion, Promotion mix and factors affecting promotion mix decisions. **Distribution Channels:** Meaning and Importance; Types of distribution channels; Functions of middle man; Factors affecting choice of distribution channel; Wholesaling and retailing; Types of Retailers; e-retailing.

Module No. 5: Recent Developments in Marketing

08

Social Marketing, Online Marketing, Green Marketing, Search Engine Marketing, Mobile Marketing, Social Media Marketing, Email Marketing, Live Video Streaming Marketing, Affiliate Marketing, Chatbots, Influencer Marketing, Global Marketing, Experiential Marketing, and any other recent developments in Marketing.

Skill Development Activities:

- Analyse the marketing environment of your locality and identify need, wants & purchasing power of customers.

2. Collect consumer behaviour towards home appliances in your locality.
3. Visit any organisation and collect the information towards pricing of the products.
4. Visit any wholesalers/Retailers, collect the role of them in marketing.
5. Identify the recent developments in the field of marketing.
6. Any other activities, which are relevant to the course.

Text Books:

1. Philip Kotler (2015), Principles of Marketing. 13th edition. Pearson Education.
2. Saxena Rajan, (2017) Marketing Management, Tata McGraw-Hill Publishing Company Ltd., New Delhi. Fifth Edition.
3. Kumar Arun & MeenakshiN (2016), Marketing Management, Vikas Publishing House Pvt. Ltd., New Delhi. Third Edition
4. Panda Tapan (2008), Marketing Management, Excel books, New Delhi, Second Edition.
5. Michael, J. Etzel, Bruce J. Walker, William J Stanton and Ajay Pandit. Marketing: Concepts and Cases. (Special Indian Edition)., McGraw Hill Education
6. William D. Perreault, and McCarthy, E. Jerome., Basic Marketing. Pearson Education.
7. Majaro, Simon. The Essence of Marketing. Pearson Education, New Delhi.
8. Iacobucci and Kapoor, Marketing Management: A South Asian Perspective. Cengage Learning.
9. Chhabra, T.N., and S. K. Grover. Marketing Management. Fourth Edition.

Note: Latest edition of text books may be used.

Name of the Program: Bachelor of Commerce (B.Com)

Course Code: B.Com. 1.5 (Open Elective Course)

Name of the Course: Accounting for Everyone

Course Credits	No. of Hours per Week	Total No. of Teaching Hours
3 Credits	3 Hrs	42 Hrs

Pedagogy: Classrooms lecture, Case studies, Group discussion, Seminar & field work etc.,

Course Outcomes: On successful completion of the course, the Students will be able to

- a) Analyse various terms used in accounting;
- b) Make accounting entries and prepare cash book and other accounts necessary while running a business;
- c) Prepare accounting equation of various business transactions;
- d) Analyse information from company's annual report;
- e) Comprehend the management reports of the company.

Syllabus:

Hours

Module No. 1: Introduction to Accounting

08

Meaning, Importance and Need, Its objectives and relevance to business establishments and other organizations, and individuals. Accounting information: meaning, users and utilities, sources of accounting information. Some Basic Terms –Transaction, Account, Asset, Liability, Capital, Expenditure & Expense, Income, Revenue, Gain, Profit, Surplus, Loss, Deficit. Debit, Credit, Accounting Year, Financial Year.

Module No. 2: Transactions and Recording of Transactions

08

Features of recordable transactions and events, Basis of recording – vouchers and another basis. Recording of transactions: Personal account, Real Account and Nominal Account; Rules for Debit and Credit; Double Entry System, journalizing transactions; Preparation of Ledger, Cash Book including bank transactions. (Simple Problems)

Module No. 3: Preparation of Financial Statements

10

Fundamental Accounting Equation; Concept of revenue and Capital; Preparation of Financial Statements. (Simple problems)

Module No. 4: Company Accounts

08

Explanation of certain terms – Public Limited Company, Private Limited Company, Share, Share Capital, Shareholder, Board of Directors, Stock Exchange, Listed Company, Share Price, Sensex - BSE, NSE; Annual report, etc.

Module 5: Management Reports

08

Reports on Management Review and Governance; Report of Board of Directors - Management discussion analysis- Annual Report on CSR – Business responsibility report – Corporate governance report – Secretarial audit report.

Skill Development Activities:

1. Download annual reports of business Organisations from the websites and go through the contents of the annual report and present the salient features of the annual report using some ratios and content analysis including textual analysis.
2. Prepare accounting equation by collecting necessary data from medium sized firm.
3. Prepare financial statements collecting necessary data from small business firms.
4. Collect the management reports of any large scale organisation and analyse the same.
5. Any other activities, which are relevant to the course.

Text Books:

1. Hatfield, L. (2019). Accounting Basics. Amazon Digital Services LLC.
2. Horngren, C. T., Sundem, G. L., Elliott, J. A., & Philbrick, D. (2013). Introduction to Financial Accounting. London: Pearson Education.
3. Siddiqui, S. A. (2008). Book Keeping & Accountancy. New Delhi: Laxmi Publications Pvt. Ltd.
4. Sehgal, D. (2014). Financial Accounting. New Delhi: Vikas Publishing House Pvt. Ltd.
5. Tulsian, P. C. (2007). Financial Accounting. New Delhi: Tata McGraw Hill Publishing Co. Ltd.
6. Mukharji, A., & Hanif, M. (2015). Financial Accounting. New Delhi: Tata McGraw Hill Publishing Co. Ltd.
7. Maheshwari, S. N., Maheshwari, S. K., & Maheshwari, S. K. (2018). Financial Accounting. New Delhi: Vikas Publishing House Pvt. Ltd.
8. Khan, M. Y. and Jain, P.K. Management Accounting. McGraw Hill Education.
9. Arora, M.N. Management Accounting, Vikas Publishing House, New Delhi

Note: Latest edition of text books may be used.

Name of the Program: Bachelor of Commerce (B.Com)

Course Code: B.Com. 1.5 (Open Elective Course)

Name of the Course: Financial Literacy

Course Credits	No. of Hours per Week	Total No. of Teaching Hours
3 Credits	3 Hrs	42 Hrs

Pedagogy: Classrooms lecture, Case studies, Group discussion, Seminar & field work etc.,

Course Outcomes: On successful completion of the course, the Students will be able to

- Describe the importance of financial literacy and list out the institutions providing financial services;
- Prepare financial plan and budget and manage personal finances;
- Open, avail, and manage/operate services offered by banks;
- Open, avail, and manage/operate services offered by post offices;
- Plan for life insurance and property insurance & select instrument for investment in shares

Syllabus:	Hours
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Module No. 1: Introduction	07
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Meaning, importance and scope of financial literacy; Prerequisites of Financial Literacy – level of education, numerical and communication ability; Various financial institutions – Banks, Insurance companies, Post Offices; Mobile App based services. Need of availing of financial services from banks, insurance companies and postal services.

Module No. 2: Financial Planning and Budgeting	07
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Concept of economic wants and means for satisfying these needs; Balancing between economic wants and resources; Meaning, importance and need for financial planning; Personal Budget, Family Budget, Business Budget and National Budget; Procedure for financial planning and preparing budget; Budget surplus and Budget deficit, avenues for savings from surplus, sources for meeting deficit.

Module No. 3: Banking Services	10
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Types of banks; Banking products and services – Various services offered by banks; Types of bank deposit accounts – Savings Bank Account, Term Deposit, Current Account, Recurring Deposit, PPF, NSC etc.; Formalities to open various types of bank accounts, PAN Card, Address proof, KYC norm; Various types of loans – short term, medium term, long term, micro finance, agricultural etc. and related interest rates offered by various nationalized banks and post office; Cashless banking, e-banking, Check Counterfeit Currency; CIBIL, ATM, Debit and Credit Card, and APP based Payment system; Banking complaints and Ombudsman.

Module No. 4: Financial Services from Post Office	08
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Post office Savings Schemes: Savings Bank, Recurring Deposit, Term Deposit, Monthly Income Scheme, Kishan Vikas Patra, NSC, PPF, Senior Citizen Savings Scheme (SCSS), Sukanya Samridhi Yojana/ Account (SSY/SSA); India Post Payments Bank (IPPB). Money Transfer: Money Order, E-Money order. Instant Money Order, collaboration with the Western Union Financial Services; MO Videsh, International Money Transfer Service, Electronic Clearance Services (ECS), Money gram International Money Transfer, Indian Postal Order (IPO).

Module 5: Protection and Investment Related Financial Services	10
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Insurance Services: Life Insurance Policies: Life Insurance, Term Life Insurance, Endowment Policies, Pension Policies, ULIP, Health Insurance and its Plans, Comparison of

policies offered by various life insurance companies. Property Insurance: Policies offered by various general insurance companies. Post office life Insurance Schemes: Postal Life Insurance and Rural Postal Life Insurance (PLI/RPLI). Housing Loans: Institutions providing housing loans, Loans under Pradhanmantri Awas Yojana – Rural and Urban.

Investment avenues in Equity and Debt Instruments: Portfolio Management: Meaning and importance; Share Market and Debt Market, Sensex and its significance; Investment in Shares – selection procedure for investment in shares; Risk element; Investment Management - Services from brokers and Institutions, and self-management; Mutual Fund.

Skill Development Activities:

1. Visit banks, post offices, and insurance companies to collect information and required documents related to the services offered by these institutions and to know the procedure of availing of these services.
2. Fill up the forms to open accounts and to avail loans and shall attach photocopies of necessary documents.
3. Prepare personal and family budget for one/six/ twelve month on imaginary figures.
4. Try to open Demat account and trade for small amount and submit the report on procedure on opening of Demat account and factors considered for trading.
5. Any other activities, which are relevant to the course.

Text Books:

1. Avadhani, V. A. (2019). Investment Management. Mumbai: Himalaya Publishing House Pvt. Ltd.
2. Chandra, P. (2012). Investment Game: How to Win. New Delhi: Tata McGraw Hill Education.
3. Kothari, R. (2010). Financial Services in India-Concept and Application. New Delhi: Sage Publications India Pvt. Ltd.
4. Milling, B. E. (2003). The Basics of Finance: Financial Tools for Non-Financial Managers. Indiana: universe Company.
5. Mitra, S., Rai, S. K., Sahu, A. P., & Starn, H. J. (2015). Financial Planning. New Delhi: Sage Publications India Pvt. Ltd.
6. Zokaityte, A. (2017). Financial Literacy Education. London: Palgrave Macmillan.

Note: Latest edition of text books may be used.

SECOND SEMESTER

- **Advanced Financial Accounting**
- **Business Mathematics/Corporate Administration**
- **Law & Practice of Banking**
- **Financial Environment (OE)**

OR

- **Investing in Stock Market (OE)**

Name of the Program: Bachelor of Commerce (B.Com.)

Course Code: B.Com. 2.1

Name of the Course: Advanced Financial Accounting

Course Credits	No. of Hours per Week	Total No. of Teaching Hours
4 Credits	4 Hrs	56 Hrs

Pedagogy: Classrooms lecture, Case studies, Tutorial classes, Group discussion, Seminar & field work etc.,

Course Outcomes: On successful completion of the course, the Students will be able to

- Understand & compute the amount of claims for loss of stock & loss of Profit.
- Learn various methods of accounting for hire purchase transactions.
- Deal with the inter-departmental transfers and their accounting treatment.
- Demonstrate various accounting treatments for dependent & independent branches.
- Prepare financial statements from incomplete records.

Syllabus:	Hours
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Module No. 1: Insurance Claims for Loss of Stock & Loss of Profit	10
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Introduction-Meaning of fire-computation of Claim for loss of stock- Computations of Claim for loss of Profit-Average Clause.

Module No. 2: Hire Purchase Accounting	10
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Introduction-Meaning of hire purchase-difference between hire purchase and instalment-Nature-features-terms used-Ascertainment of Interest-Accounting for hire purchase transactions-Repossession.

Module No. 3: Departmental Accounts	12
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Introduction-meaning-advantages and disadvantages-methods of departmental accounting-basis of allocation of common expenditure among different departments-types of departments-inter department transfer and its treatment

Module No. 4: Accounting for Branches	12
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Introduction-difference between branch accounts and departmental accounts-types of branches-Accounting for dependent & independent branches;

Module No. 5: Conversion of Single Entry into Double Entry	12
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Introduction - Meaning-Limitations of Single Entry System-Difference between Single Entry and Double Entry System - Problems on Conversion of Single Entry into Double Entry.

Skill Developments Activities:

- Identify the procedure & documentations involved in the insurance claims.
- Collect hire purchase agreements and draft dummy hire purchase agreements with imaginary figures.
- Identify the common expenditures of an organisation among various departments.
- Collect the procedure and documentations involved in the establishment of various branches.
- Visit any sole proprietor firm and identify the steps involved in the conversion of single entry into double entry system.
- Any other activities, which are relevant to the course.

Text Books:

- ICAI Study Materials on Principles & Practice of Accounting, Accounting and Advanced Accounting.

2. SP Iyengar (2005), Advanced Accounting, Sultan Chand & Sons, Vol. 1.
3. Robert N Anthony, David Hawkins, Kenneth A. Merchant, (2017) Accounting: Text and Cases, McGraw-Hill Education, 13th Edition.
4. Charles T. Horngren and Donna Philbrick, (2013) Introduction to Financial Accounting, Pearson Education, 11th Edition.
5. J.R. Monga, Financial Accounting: Concepts and Applications. Mayur Paper Backs, New Delhi, 32nd Edition.
6. S.N. Maheshwari, and. S. K. Maheshwari. Financial Accounting. Vikas Publishing House, New Delhi, 6th Edition.
7. B.S. Raman (2008), Financial Accounting Vol. I & II, United Publishers & Distributors
8. Compendium of Statements and Standards of Accounting. The Institute of Chartered Accountants of India, New Delhi.

Note: Latest edition of text books may be used.

Name of the Program: Bachelor of Commerce (B.Com.)

Course Code: B.Com. 2.2

Name of the Course: Business Mathematics

Course Credits	No. of Hours per Week	Total No. of Teaching Hours
4 Credits	4 Hrs	56 Hrs

Pedagogy: Classrooms lecture, Case studies, Tutorial classes, Group discussion, Seminar & field work etc.,

Course Outcomes: On successful completion of the course, the Students will be able to

- a) Understand the number system and indices applications in solving basic business problems.
- b) Apply concept of commercial arithmetic concepts to solve business problems.
- c) Make use of theory of equation in solving the business problems in the present context.
- d) Understand and apply the concepts of Set Theory, Permutations & Combinations
- e) Application of matrix in business problems.

Syllabus:	Hours
Module No. 1: Number System and Indices	12
Introduction - Meaning - Natural Numbers - Even & Odd Numbers - Prime, Rational Number and its features & Irrational Numbers - simple problems on finding sum of natural, Odd and Even numbers- HCF and LCM, problems thereon; Indices-Introduction, Laws of indices, application of laws for simplification, simple problems.	
Module No. 2: Commercial Mathematics	10
Introduction - Meaning of Simple and Compound interest and problems thereon,- Annuities, types & problems on present and future value of annuity; Ratios and Proportions-meaning and problems thereon-problems on speed, time and work.	
Module No. 3: Theory of Equation	12
Introduction - Meaning-Problems on Linear equations and solving pure and adfected quadratic equations (factor and Sridharacharya methods only), problems on Simultaneous equations (Elimination method only).	
Module No. 4: Set Theory, Permutations & Combinations and Matrices	12
Introduction - Meaning & types of sets-Laws of Sets-Venn diagram-problems thereon; Meaning and problems on permutations and combinations;	
Module No. 5: Matrices and Determinants	10
Meaning and types of matrices, operations of Addition, Subtraction and Multiplication of Matrices, Problems on Transpose of a Matrix, Determinants of a Square Matrix, Minor and co-factor of an element, adjoint of a square matrix, Singular and Non-singular of a matrix, Inverse of a square matrix, Cramer's Rule (only Two variables only)	

Skill Developments Activities:

1. Show the number of ways in which your telephone number can be arranged to get odd numbers.
2. Visit any Commercial Bank in your area and collect the information about types of loans and the rates of interest on loans.
3. Use Matrix principles to implement food requirement and protein for two families.
4. Measure your classroom with the help of a tape and find the cost of the carpet for the floor area of the classroom.
5. Any other activities, which are relevant to the course.

Text Books:

1. S.N.Dorairaj, Business Mathematics, United Publication.
2. R. Gupta, Mathematics for Cost Accountants.
3. S. P. Gupta, Business Mathematics.
4. Madappa and Sridhara Rao, Business Mathematics.
5. Padmalochana Hazarika, Business Mathematics.
6. Dr. Padmalochan Hazarika, A Textbook of Business Mathematics, S. Chand, New Delhi, No. 4, 2016.
7. A. P. Verma, Business Mathematics, Asian Books Private Limited, New Delhi, No. 3, January 2007.
8. D. C. Sancheti & V. K. Kapoor, Business Mathematics, S. Chand, New Delhi, 2014
9. A Lenin Jothi, Financial Mathematics, Himalaya Publications, Mumbai, No. 1, 2009.
10. B. M. Aggarwal, Business Mathematics, Ane Books Pvt. Ltd., No. 5, 2015

Note: Latest edition of text books may be used.

Name of the Program: Bachelor of Commerce (B.Com.)

Course Code: B.Com. 2.2

Name of the Course: Corporate Administration

Course Credits	No. of Hours per Week	Total No. of Teaching Hours
4 Credits	4 Hrs	56 Hrs

Pedagogy: Classrooms lecture, Case studies, Group discussion, Seminar & field work etc.,

Course Outcomes: On successful completion of the course, the Students will be able to

- Understand the framework of Companies Act of 2013 and different kind of companies.
- Identify the stages and documents involved in the formation of companies in India.
- Analyse the role, responsibilities and functions of Key management Personnel in Corporate Administration.
- Examine the procedure involved in the corporate meeting and the role of company secretary in the meeting.
- Evaluate the role of liquidator in the process of winding up of the company.

Syllabus: **Hours**

Module No. 1: Introduction to Company **12**

Introduction - Meaning and Definition – Features – Highlights of Companies Act 2013 - - Kinds of Companies – One Person Company-Private Company-Public Company-Company limited by Guarantee-Company limited by Shares- Holding Company-Subsidiary Company-Government Company-Associate Company- Small Company-Foreign Company-Global Company-Body Corporate-Listed Company.

Module No. 2: Formation of Companies **12**

Introduction - **Promotion Stage:** Meaning of Promoter, Position of Promoter & Functions of Promoter, **Incorporation Stage:** Meaning & contents of Memorandum of Association & Articles of Association, Distinction between Memorandum of Association and Articles of Association, Certificate of Incorporation, **Subscription Stage** – Meaning & contents of Prospectus, Statement in lieu of Prospects and Book Building, **Commencement Stage** – Document to be filed, e-filing, Register of Companies, Certificate of Commencement of Business; Formation of Global Companies: Meaning – Types –Features – Legal Formalities– Administration.

Module No. 3: Company Administration **12**

Introduction - Key Managerial Personnel – Managing Director, Whole time Directors, the Companies Secretary, Chief Financial Officer, Resident Director, Independent Director, Auditors – Appointment – Powers - Duties & Responsibilities. Managing Director – Appointment – Powers – Duties & Responsibilities. Audit Committee, CSR Committee. Company Secretary - Meaning, Types, Qualification, Appointment, Position, Rights, Duties, Liabilities & Removal or dismissal.

Module No. 4: Corporate Meetings **10**

Introduction - Corporate meetings: types – Importance - Distinction; Resolutions: Types – Distinction; Requisites of a valid meeting – Notice – Quorum –Proxies - Voting - Registration of resolutions; Role of a company secretary in convening the meetings.

Module No. 5: Winding Up **10**

Introduction – Meaning- Modes of Winding up –Consequence of Winding up – Official Liquidator – Role & Responsibilities of Liquidator – Defunct Company – Insolvency Code.

Skill Development Activities:

1. Collect the Companies Act 2013 from the Ministry of Corporate Affairs website and

- prepare the highlights of the same.
2. Visit any Registrar of the Companies, find out the procedure involved in the formation of the companies.
 3. Visit any Company and discuss with Directors of the same on role and responsibilities and prepare report on the same.
 4. Collect the copy of notice of the Meeting and Resolutions, Prepare the dummy copy of Notice and resolutions.
 5. Contact any official liquidator of an organisation and discuss the procedure involved on the same and prepare report.
 6. Any other activities, which are relevant to the course.

Text Books:

1. S.N Maheshwari, Elements of Corporate Law, HPH.
2. Balchandran, Business Law for Management, HPH
3. Dr. P.N. Reddy and H.R. Appanaiah, Essentials of Company Law and Secretarial Practice, HPH.
4. K. Venkataramana, Corporate Administration, SHBP.
5. N.D. Kapoor: Company Law and Secretarial Practice, Sultan Chand.
6. M.C. Bhandari, Guide to Company Law Procedures, Wadhwa Publication.
7. S.C. Kuchal, Company Law and Secretarial Practice.
8. S.C. Sharm, Business Law, I.K. International Publishers

Note: Latest edition of text books may be used.

Name of the Program: Bachelor of Commerce (B.Com.)

Course Code: B.Com. 2.3

Name of the Course: Law and Practice of Banking

Course Credits	No. of Hours per Week	Total No. of Teaching Hours
4 Credits	4 Hrs	56 Hrs

Pedagogy: Classrooms lecture, Case studies, Tutorial classes, Group discussion, Seminar & field work etc.,

Course Outcomes: On successful completion of the course, the Students will be able to

- a) Summarize the relationship between Banker & customer and different types of functions of banker.
- b) Analyse the role, functions and duties of paying and collecting banker.
- c) Make use of the procedure involved in opening and operating different accounts.
- d) Examine the different types of negotiable instrument & their relevance in the present context.
- e) Estimate possible developments in the banking sector in the upcoming days.

Syllabus:

Module No. 1: Introduction to Banking **12**

Introduction- Meaning – Need – Importance – Primary, Secondary & Modern functions of banks - Origin of banking- Banker and Customer Relationship (General and special relationship) - Origin and growth of commercial banks in India – Types of Banks in India– Banks’ Lending - changing role of commercial banks. RBI: History-Role & Functions.

Module No. 2: Paying and Collecting Banker **12**

Paying banker: Introduction - Meaning – Role – Functions - Duties - Precautions and Statutory Protection and rights - Dishonor of Cheques – Grounds of Dishonor – Consequences of wrongful dishonor of Cheques; **Collecting Banker:** Introduction - Meaning – Legal status of collecting banker - Holder for value -Holder in due course – Duties & Responsibilities - Precautions and Statutory Protection to Collecting Banker.

Module No. 3: Customers and Account Holders **10**

Introduction - Types of Customers and Account Holders - Procedure and Practice in opening and operating accounts of different customers: Minors - Joint Account Holders- Partnership Firms - Joint Stock companies - Executors and Trustees - Clubs and Associations and Joint Hindu Undivided Family.

Module No. 4: Negotiable Instruments **12**

Introduction – Meaning & Definition – Features – Kinds of Negotiable Instruments: Promissory Notes - Bills of Exchange - Chques - Crossing of Cheques – Types of Crossing; Endorsements: Introduction - Meaning - Essentials & Kinds of Endorsement – Rules of Endorsement.

Module No. 5: Recent Developments in Banking **10**

Introduction - New technology in Banking – E-services – Debit and Credit cards - Internet Banking-Electronic Fund Transfer- MICR – RTGS - NEFT –ECS- Small banks-Payment banks- Digital Wallet-Crypto currency- KYC norms – Basel Norms - Mobile banking-E-payments - E-money.

Skill Development Activities:

1. Refer RBI website and identify the different types of banks operating in India.
2. Visit any Public sector bank & discuss with the branch manager about the role and functions as a paying and collecting banker.
3. Collect and fill dummy account opening forms as different types of customer.
4. Draft specimen of Negotiable instruments: bill of exchange, Promissory Notes and Cheques.

5. Identify and prepare report on pros and cons of recent development in the field of banking sector.
6. Any other activities, which are relevant to the course.

Text Books:

1. Gordon & Natarajan, Banking Theory Law and Practice, HPH, 24th Edition
2. S. P Srivastava (2016), Banking Theory & Practice, Anmol Publications
3. Maheshwari. S.N. (2014), Banking Law and Practice, Kalyani Publishers, 11 edition
4. Shekar. K.C (2013), Banking Theory Law and Practice, Vikas Publication, 21st Edition.
5. Dr. Alice Mani (2015), Banking Law and Operation, SBH.

Note: Latest edition of text books may be used.

Name of the Program: Bachelor of Commerce (B.Com)

Course Code: B.Com. 2.6 (Open Elective Course)

Name of the Course: Financial Environment

Course Credits	No. of Hours per Week	Total No. of Teaching Hours
3 Credits	3 Hrs	42 Hrs

Pedagogy: Classrooms lecture, Case studies, Tutorial classes, Group discussion, Seminar & field work etc.,

Course Outcomes: On successful completion of the course, the Students will be able to

- Understand the fundamentals of Indian Economy and its significance.
- Evaluate the impact of monetary policy on the stakeholders of the Economy.
- Assess the impact of fiscal policy on the stakeholders of the Economy.
- Examine the status of inflation, unemployment and labour market in India
- Inference the financial sector reforms in India.

Syllabus:

Hours

Module No. 1: Fundamentals of India Economy

10

Introduction - Production & Cost-Demand & Supply-Perfect & Imperfect Competition-Monopoly-National Income Accounting-Business Cycle-Open Economy-Utility theory-GDP-GNP-impact- other Marco financial indicators.

Module No. 2: Monetary Policy

08

Introduction - Meaning-objectives-qualitative & quantitative measures for credit control. Influence of policy rates of RBI: Repo-Reverse repo- Marginal standing facility and Bank rate. Influence of reserve ratios of RBI: CRR-SLR-Exchange rates-lending/deposit rates-design & issues of monetary policy-LAF - RBI Role, functions and its Governance

Module No. 3: Fiscal Policy

08

Introduction - Meanings-objectives- public expenditure-public debt-fiscal & budget deficit-Keynesian approach-fiscal policy tools-fiscal policy effects on employment-supply side approach-design & issues of fiscal policy-fiscal budget- Role of Ministry of Finance in Fiscal Policy.

Module No. 4: Inflation, Unemployment and Labour market

08

Introduction - **Inflation:** Causes of rising & falling inflation-inflation and interest rates-social costs of inflation; **Unemployment** - natural rate of unemployment-frictional & wait unemployment. **Labour market** and its interaction with production system; Phillips curve-the trade-off between inflation and unemployment-sacrifice ratio-role of expectations adaptive and rational

Module 5: Financial Sector Reforms:

08

Introduction - Financial sector reforms - Recommendation & action taken -SARFESI Act-Narasimham Committee I & II- Kelkar Committee- FRBM Act - Basel-BIS-history-need-mission-objectives-Basel norms I, II & III- criticism of Basel norms-Implementations of Basel norms in India- impact of Basel norms on Indian banks.

Skill Development Activities:

- Collect last ten year GDP rate and examine the same.
- Collect last two years monetary policy rates of RBI and analyse the impact of the same.

3. Collect last five years fiscal policy of Indian Government and analyse the impact of the same on rural poor.
4. Collect last five year data on inflation, unemployment rate and labour market conditions and critically prepare the report.
5. Identify the recent financial sector reforms in India.

Any other activities, which are relevant to the course.

Text Books:

1. V K Puri and S K Mishra, Indian Economy, HPH.
2. Datt and Sundharam's, Indian Economy, S Chand
3. Ramesh Singh, Indian Economy, McGraw Hill education.
4. Khan and Jain, Financial Services, McGraw Hill Education, 8th edition
5. RBI working papers
6. Ministry of Finance, GOI of working papers
7. SEBI Guidelines Issued from time to time.

Note: Latest edition of text books may be used.

Name of the Program: Bachelor of Commerce (B.Com)

Course Code: B.Com. 2.6 (Open Elective Course)

Name of the Course: Investing in Stock Markets

Course Credits	No. of Hours per Week	Total No. of Teaching Hours
3 Credits	3 Hrs	42 Hrs

Pedagogy: Classrooms lecture, Case studies, Tutorial classes, Group discussion, Seminar & field work etc.,

Course Outcomes: On successful completion of the course, the Students will be able to

- Explain the basics of investing in the stock market, the investment environment as well as risk & return;
- Analyse Indian securities market;
- Examine EIC framework and conduct fundamental analysis;
- Perform technical analysis;
- Invest in mutual funds market.

Syllabus:

Module No. 1: Basics of Investing **Hours** **10**

Basics of Investment & Investment Environment. Risk and Return, Avenues of Investment - Equity shares, Preference shares, Bonds & Debentures, Insurance Schemes, Mutual Funds, Index Funds. Indian Security Markets - Primary Market, Secondary Market and Derivative Market. Responsible Investment.

Module No. 2: Fundamental Analysis **Hours** **08**

Top down and bottom up approaches, Analysis of international & domestic economic scenario, Industry analysis, Company analysis (Quality of management, financial analysis: Both Annual and Quarterly, Income statement analysis, position statement analysis including key financial ratios, Cash flow statement analysis, Industry market ratios: PE, PEG, Price over sales, Price over book value, EVA), Understanding Shareholding pattern of the company.

Module No. 3: Technical Analysis **Hours** **08**

Trading rules (credit balance theory, confidence index, filter rules, market breath, advances vs declines and charting (use of historic prices, simple moving average and MACD) basic and advanced interactive charts. Do's & Don'ts of investing in markets.

Module No. 4: Indian Stock Market **Hours** **08**

Market Participants: Stock Broker, Investor, Depositories, Clearing House, Stock Exchanges. Role of stock exchange, Stock exchanges in India- BSE, NSE and MCX. Security Market Indices: Nifty, Sensex and Sectoral indices, Sources of financial information. Trading in securities: Demat trading, types of orders, using brokerage and analyst recommendations

Module 5: Investing in Mutual Funds **Hours** **08**

Concept and background on Mutual Funds: Advantages, Disadvantages of investing in Mutual Funds, Types of Mutual funds- Open ended, close ended, equity, debt, hybrid, index funds and money market funds. Factors affecting choice of mutual funds. CRISIL mutual fund ranking and its usage, calculation and use of Net Asset Value.

Skill Development Activities:

- Work on the spreadsheet for doing basic calculations in finance.
- Learners will also practice technical analysis with the help of relevant software.
- Practice use of Technical charts in predicting price movements through line chart, bar chart, candle and stick chart, etc., moving averages, exponential moving average.
- Calculate of risk and return of stocks using price history available on NSE website.
- Prepare equity research report-use of spreadsheets in valuation of securities,

fundamental analysis of securities with the help of qualitative and quantitative data available in respect of companies on various financial websites, etc.

6. Any other activities, which are relevant to the course.

Text Books:

1. Chandra, P. (2017). Investment Analysis and Portfolio Management. New Delhi: TataMcGraw Hill Education.
2. Kevin, S. (2015). Security Analysis and Portfolio Management. Delhi: PHI Learning.Ranganatham,
3. M., & Madhumathi, R. (2012). Security Analysis and Portfolio Management. UttarPradesh: Pearson (India) Education.
4. Pandian, P. (2012). Security Analysis and Portfolio Management. New Delhi: Vikas Publishing House.

Note: Latest edition of text books may be used.

THIRD SEMESTER

- **Corporate Accounting**
- **Business Statistics**
- **Cost Accounting**
- **Corporate Governance (OE)**

OR

Business Ethics (OE)

Name of the Program: Bachelor of Commerce (B.Com.)		
Course Code: B.Com.3.1		
Name of the Course: Corporate Accounting		
Course Credits	No. of Hours per Week	Total No. of Teaching Hours
4 Credits	4 Hrs	56 Hrs
Pedagogy: Classroom lectures, Case studies, Tutorial Classes, Group discussion, Seminar & field work etc.,		
Course Outcomes: On successful completion of the course, the Students will be able to		
a) Understand the treatment of underwriting of shares.		
b) Comprehend the computation of profit prior to incorporation.		
c) Know the valuation of intangible assets.		
d) Know the valuation of shares.		
e) Prepare the financial statements of companies as per companies act, 2013.		
Syllabus:		Hours
Module No. 1: Underwriting of Shares		10
Introduction -Meaning of Underwriting – SEBI regulations regarding underwriting; Underwriting commission. Underwriter – functions - Advantages of Underwriting, Types of underwriting - Marked and Unmarked Applications –Determination of Liability in respect of underwriting contract – when fully underwritten and partially underwritten – with and without firm underwriting problem.		
Module No. 2: Profit Prior to Incorporation		10
Introduction - Meaning – calculation of sales ratio – time ratio – weighted ratio – treatment of capital and revenue expenditure – Ascertainment of pre-incorporation and post-incorporation profits by preparing statement of Profit and Loss and Balance Sheet as per schedule III of companies Act, 2013.		
Module No. 3 Valuation of Intangible Assets		10
Introduction - Valuation of Goodwill –factors influencing goodwill, circumstances of valuation of goodwill- Methods of Valuation of Goodwill: Average Profit Method, Capitalization of average Profit Method, Super Profit Method, Capitalization of Super Profit Method - Problems. Brand valuation and Intellectual Property Rights (IPR) Theory only.		
Module No. 4: Valuation of Shares		10
Introduction - Meaning – Need for Valuation – Factors Affecting Valuation – Methods of Valuation: Intrinsic Value Method, Yield Method, and Earning Capacity Method, Rights Issue and Valuation of Rights Issue.		
Module 5: Financial Statements of Companies		16
Statutory Provisions regarding preparation of financial statements of companies as per schedule III of companies act, 2013 and IND AS-1 – Treatment of Special Items – Tax deducted at source – Advance payment of Tax – Provision for Tax – Depreciation – Interest on debentures – Dividends – Rules regarding payment of dividends – Transfer to Reserves – Preparation of Statement of profit and loss and Balance Sheet.		

Skill Development Activities:

1. Compile the list of Indian companies which have issued shares through IPO / FPO in the current financial year.
2. Determine Underwriters' Liability in case of an IPO, with imaginary figures.
3. Present the format of 'Statement of Profit and Loss', 'Balance Sheet' and 'Statement of Changes in Equity', with imaginary figures
4. Collect financial statement of a company and calculate intrinsic value of an equity share.
5. Collect annual report of a Company and List out its assets and Liabilities.
6. Collection of latest financial statements of a company and find out the intrinsic value of shares
7. Collect the annual reports of company and calculate the value of goodwill under different methods

Note: Any other activities, which are relevant to the course.

Text Book

1. J.R. Monga, Fundamentals of Corporate Accounting. Mayur Paper Backs, NewDelhi.
2. M.C. Shukla, T.S. Grewal, and S.C. Gupta. Advanced Accounts. Vol.-II. S. Chand & Co., New Delhi.
3. S.N. Maheshwari, and S. K. Maheshwari. Corporate Accounting. Vikas PublishingHouse, New Delhi.
4. Ashok Sehgal, Fundamentals of Corporate Accounting. Taxman Publication, NewDelhi.
5. V.K. Goyal and Ruchi Goyal, Corporate Accounting. PHI Learning.
6. Jain, S.P. and K.L. Narang. Corporate Accounting. Kalyani Publishers, New Delhi.
7. Bhushan Kumar Goyal, Fundamentals of Corporate Accounting, InternationalBook House
8. P. C. Tulsian and Bharat Tulsian, Corporate Accounting, S.Chand
9. Amitabha Mukherjee, Mohammed Hanif, Corporate Accounting, McGraw HillEducation
10. Arulanandam & Raman ; Corporate Accounting –II
11. Madegowda J – Advanced corporate accounting, HPH
12. Soundarajan. A & K. Venkataramana, Corporate Accounting, VBH.
13. S. P. Jain and K. L. Narang – Corporate Accounting
14. S. Bhat- Corporate Accounting.

Note: Latest edition of text books may be used.

Name of the Program: Bachelor of Commerce (B.Com.)		
Course Code: B.Com. 3.2		
Name of the Course: Business Statistics		
Course Credits	No. of Hours per Week	Total No. of Teaching Hours
4 Credits	4 Hrs	56 Hrs
Pedagogy: Classroom lectures, Case studies, Tutorial Classes, Group discussion, Seminar & field work etc.,		
Course Outcomes: On successful completion of the course, the Students will be able to		
<ul style="list-style-type: none"> a) Familiarize the basic concepts of statistics b) Understand the concept of central tendency c) Comprehend the measures of variation and measures of skewness. d) Validate the application of correlation in business decisions. e) Validate the application of Regression in business decisions. 		
Syllabus:		Hours
ModuleNo.1: Introduction to Statistics		12
Meaning and Definition of Statistics, Function, Scope and Limitation of Statistics. Collection and Classification of data; Tabulation of data- Problems there on. Frequency Distribution- Ungrouped and Grouped Data-Problems there on.		
ModuleNo.2: Measures of Central Tendency		12
Meaning, Definition, Types of Averages- Mathematical averages including arithmetic mean Properties and applications. Positional Averages-Mode and Median (including graphic determination).		
ModuleNo.3: Measures of Variation and Skewness		12
Measures of Variation: absolute and relative measures of Range, Quartile deviation, Standard deviation. Skewness: Meaning, Measurement using Karl Pearson and Bowley's measures.		
ModuleNo.4: Correlation Analysis		10
Meaning of Correlation:-Types of correlation, Karl Pearson's co-efficient of Correlation; Correlation and Probable error; (Simple and Grouped Correlation)		
Module5: Regression Analysis		10
Meaning, Correlation V/s Regression, Determination of Regression Co-efficient, Regression equations (Simple and Grouped Regression)		

Skill Development Activities:

1. Application of MS Excel Functions in statistical decision making and students should submit output of the same.
2. Collect 50 Income tax payers in your locality and prepare frequency distribution table.
3. Collect data relating to prices of shares of two companies for ten days and ascertain which company's share price is more stable.
4. Collect the age statistics of 10 new married couples calculate Correlation coefficient.
5. Identify the applicability of regression in business decision making.

Text Books:

1. Gupta, S.P., and Archana Agarwal. Business Statistics, Sultan Chand and Sons, New Delhi.
2. Vohra N. D., Business Statistics, McGraw Hill Education.
3. Gupta, S.C. Fundamentals of Statistics. Himalaya Publishing House.
4. Anderson, Sweeney, and Williams, Statistics for Students of Economics and Business, Cengage Learning.
5. DN Elhance - Fundamentals of statistics
6. Sen Chetty and Kapoor - Mathematical statistics

Note: Latest edition of text books may be used.

Name of the Program: Bachelor of Commerce (B.Com.)		
Course Code: B.Com. 3.3		
Name of the Course: Cost Accounting		
Course Credits	No. of Hours per Week	Total No. of Teaching Hours
4 Credits	4 Hrs	56 Hrs
Pedagogy: Classrooms lecture, Case studies, Tutorial classes, Group discussion, Seminar & field work etc.,		
Course Outcomes: On successful completion of the course, the students will be able to		
<ul style="list-style-type: none"> a) Understand concepts of cost accounting & Methods of Costing. b) Outline the Procedure and documentations involved in procurement of materials& compute the valuation of Inventory. c) Make use of payroll procedures & compute idle and over time. d) Discuss the methods of allocation, apportionment & absorption of overheads. e) Prepare cost sheet & discuss cost allocation under ABC. 		
Syllabus:		Hours
Module No. 1: Introduction to Cost Accounting		12
Introduction- Meaning and definition- Objectives, Importance and Uses of Cost Accounting, Difference between Cost Accounting and Financial Accounting; Various Elements of Cost and Classification of Cost; Cost object, Cost unit, Cost driver, cost centre; Cost reduction and Cost control; Methods and Techniques of Costing (Meanings Only); Use of IT in Cost Accounting; Limitations of Cost Accounting; Cost Sheet: Meaning and Cost heads in a Cost Sheet, Presentation of Cost Information in Cost Sheet . Problems on Cost Sheet, Tenders and Quotations.		
Module No. 2: Material Cost		12
Materials: Meaning, Importance and Types of Materials – Direct and Indirect Material Materials material control. - Inventory control Technique of inventory control, problems on level setting and EOQ. Procurement- Procedure for procurement of materials and documentation involved in materials accounting – Material Storage: Duties of Store keeper, pricing of material issues, preparation of Stores Ledger Account – FIFO, LIFO, Simple Average Price and Weighted Average Price Methods – Problems.		
Module No. 3: Employee Cost		10
Introduction – Employee Cost – types of labour cost -Labour Cost Control – time keeping and time booking and Payroll Procedure -Preparation of Payroll: Idle Time Causes and Treatment of Normal and Abnormal Idle time, Over Time Causes and Treatment -Labour Turnover- Meaning, Reasons and Effects of Labour turnover. Methods of Wage Payment: Time rate system and piece rate system, and the Incentive schemes- Halsey plan, Rowan plan and Taylor differential piece rate system-problems.		
Module No. 4: Overheads Cost		12

Introduction- Meaning and Classification of Overheads; Accounting and Control of Manufacturing Overheads: Estimation and Collection, Cost Allocation, Apportionment, Re-apportionment and Absorption of Manufacturing Overheads; Problems on Primary and Secondary overheads distribution using Reciprocal Service Methods (Repeated Distribution Method); Absorption of Overheads: Meaning and Methods of Absorption of Overheads; Problems on Machine Hour Rate.

Module No. 5: Reconciliation of Cost and Financial Accounts

10

Introduction – meaning of reconciliation, Reasons for differences in Profits under Financial and Cost Accounts; Procedure for Reconciliation – Ascertainment of Profits as per Financial Accounts and Cost Accounts and Reconciliation of Profits of both sets of Accounts – Preparation of Reconciliation Statement – Problems.

Skill Developments Activities:

1. Visit any Manufacturing entity, collect the method of inventory valuation adopted & procedure involved in procuring inventory.
2. Draw the format of five documents used for material accounting
3. Prepare dummy Payroll with imaginary figures.
4. Visit any large-scale organization, identify the techniques used for controlling administrative, Selling & distribution overheads.
5. Visit any manufacturing entity and collect the cost data and prepare the cost sheet.

Note: Any other activities, which are relevant to the course.

Text Books:

1. Charles T. Horngren, Srikant M. Datar, Madhav V. Rajan, Cost Accounting: A Managerial Emphasis, Pearson Education.
2. Jawahar Lal, Cost Accounting., McGraw Hill Education
3. Madegowda J, Cost Accounting, HPH.
4. Rajiv Goel, Cost Accounting, International Book House
5. Jain, S.P. and K.L. Narang. Cost Accounting: Principles and Methods. Kalyani Publishers
6. Arora, M.N. Cost Accounting – Principles and Practice, Vikas Publishing House, New Delhi.
7. Maheshwari, S.N. and S.N. Mittal. Cost Accounting: Theory and Problems. Shri Mahavir Book Depot, New Delhi.
8. Iyengar, S.P. Cost Accounting, Sultan Chand & Sons
9. Mariyappa B Cost Accounting, HPH

Note: Latest edition of text books may be used.

Name of the Program: Bachelor of Commerce (B.Com.)		
Course Code: B.Com. 3.5 (OEC)		
Name of the Course: Advertising Skills		
Course Credits	No. of Hours per Week	Total No. of Teaching Hours
3 Credits	3 Hrs	42 Hrs
Pedagogy: Classrooms lecture, Case studies, Tutorial classes, Group discussion & Seminar etc.,		
Course Outcomes: On successful completion of the course, the students will be able to		
<ul style="list-style-type: none"> a) Familiarize with advertising concepts. b) Able identify effective media choice for advertising. c) Develop ads for different media. d) Measure the advertising effectiveness. e) Analyze the role of advertising agency. 		
Syllabus:		Hours
Module No. 1: Introduction		10
Communication Process; Advertising as a tool of communication; Meaning, nature and importance of advertising; Types of advertising; Advertising objectives. Audience analysis; Setting of advertising budget: Determinants and major methods.		
Module No. 2: Media Decisions		07
Major media types - their characteristics, internet as an advertising media, merits and demerits; Factors influencing media choice; media selection, media scheduling, Advertising through the Internet-media devices.		
Module No. 3: Message Development		08
Advertising appeals, Advertising copy and elements, Preparing ads for different media. Namely television. News papers and Facebook.		
Module No. 4: Measuring Advertising Effectiveness		10
Evaluating communication and sales effects; Pre- and Post-testing techniques.		
Module No. 5: Advertising Agency		07
<ul style="list-style-type: none"> a) Advertising Agency: Role, types and selection of advertising agency. b) Social, ethical and legal aspects of advertising in India. 		
Skill Development Activities:		
<ul style="list-style-type: none"> 1. Analyze the audience feedback on advertisement of FMCG. 2. List out any ten products/services advertised through internet. 3. Design any two ads for print media. 4. Examine the legal aspects of advertising in India and submit the report. 		
Note: Any other activities, which are relevant to the course.		

Text Books:

1. George E Belch, Michael A Belch, Keyoor Purani, Advertising and Promotion .An Integrated Marketing Communications Perspective (SIE), McGraw Hill Education
2. S. Wats Dunn, and Arnold M. Barban. Advertising: It's Role in Marketing. Dryden Press
3. Burnett, Wells, and Moriatty. Advertising: Principles and Practice. 5th ed.Prentice Hall of India, New Delhi.
4. Batra, Myers and Aakers. Advertising Management. PHI Learning.
5. Terence A. Shimp. Advertising and Promotion: An IMC Approach. CengageLearning.
6. Sharma, Kavita. Advertising: Planning and Decision Making, Taxmann Publications
7. Jaishree Jethwaney and Shruti Jain, Advertising Management, Oxford UniversityPress, 2012
8. Chunawala and Sethia, Advertising, Himalaya Publishing House
9. Ruchi Gupta, Advertising, S. Chand & Co.
10. O'Guinn, Advertising and Promotion: An Integrated Brand Approach, Cengage Learning

Note: Latest edition of text books may be used.

Name of the Program: Bachelor of Commerce (B.Com.) Course Code: B.Com.3.5(OEC) Name of the Course: Business Ethics		
Course Credits	No. of Hours per Week	Total No. of Teaching Hours
3Credits	3Hrs	42Hrs
Pedagogy: Class rooms lecture, Case studies, Tutorial classes, Group discussion, Seminar etc.,		
Course Outcomes :On successful completion of the course , the students will be able to <ol style="list-style-type: none"> a) Explain the concepts of business ethics and its approaches. b) Examine the business and organizational ethics in the present context. c) Analyze the ethical aspects in marketing and HR areas. d) Analyze the ethical aspects in finance and IT areas. e) Examine the impact of globalization non business ethics. 		
Syllabus:		Hours
Module No.1:Business Ethics		08
Introduction, Concepts and theories: Introduction, definitions, importance and need for Business ethics, Values and morals. Management and ethics, Normative Theories, –Gandhian Approach, Friedman’s Economic theory, Kant’s Deonto logical theory, Mill & Bentham’s Utilitarianism theory.		
Module No.2:Business & Organizational Ethics		10
The Indian Business scene, Ethical Concerns, LPG & Global trends in business ethics, Business ethics rating in India. Organizations & Organization culture, Types of Organization, Corporate code of ethics –Formulating, Advantages, implementation Professional is and professional ethics code.		
Module No.3:Ethical Aspects in Organization-I		08
Marketing ethics and Consumer ethics–Ethical issues in advertising, Criticisms in Marketing ethics, Ethics in HRM: Selection, Training and Development–Ethics at workplace–Ethics in Performance Appraisal.		
Module No.4:Ethical Aspects in Organization-II		08
Ethics in Finance: Insider trading - Ethical investment - Combating Frauds. Ethical issues in Information Technology: Information Security and Threats–Intellectual Property Rights–Cybercrime.		
Module No.5:Globalization and Business Ethics		08
Growth of Global Corporations, Factors facilitating Globalization, Impact of globalization on Indian corporate and social culture, Advantages and disadvantages of MNC’s to the Host Country, International codes of Business Conduct, Whistle Blowing and its codes.		

Skill Development Activities:

1. The students may be asked to conduct the survey of any two organizations to study the ethical practices.
2. List out any five most ethical rating of Indian companies.
3. Collect the information on unethical practices in marketing and HR area.
4. Collect the information on unethical practices in finance and IT area.
5. Analyze and submit the report on the impact of globalization on Indian business houses in the context of ethical aspects.

Note: Any other activities, which are relevant to the course.

Text Books:

1. Laura P Hartman,T, Perspectives in Business Ethics, Tata McGraw Hill.
2. B.H. Agalgatti& R.P. Banerjee, Business Ethics–Concept & Practice, Nirali Publication.
3. R.P. Banerjee, Ethics in Business & Management, Himalaya Publication
4. Crane, Business Ethics, Pub. By Oxford Press
5. C S V Murthy, Business Ethics, Himalaya Publishing House

Note: Latest edition of text books may be used.

FOURTH SEMESTER

- **Advanced Corporate Accounting**
- **Costing Methods & Techniques**
- **Business Regulatory Framework**
- **Entrepreneurship Skills (OE)**

OR

- **Advertising Skills (OE)**

Name of the Program: Bachelor of Commerce (B.Com.)		
Course Code: B.Com. 4.1		
Name of the Course: Advanced Corporate Accounting		
Course Credits	No. of Hours per Week	Total No. of Teaching Hours
4 Credits	4 Hrs	56 Hrs
Pedagogy: Classroom lectures, Case studies, Tutorial classes, Group discussion & Seminar etc.,		
Course Outcomes: On successful completion of the course, the Students will be able to		
a) Know the procedure of redemption of preference shares.		
b) Comprehend the different methods of Mergers and Acquisition of Companies		
c) Understand the process of internal reconstruction.		
d) Prepare the liquidators final statement of accounts.		
e) Understand the recent developments in accounting and accounting standards.		
Syllabus:		Hours
Module No. 1: Redemption of Preference Shares		10
Meaning – legal provisions – treatment regarding premium on redemption – creation of Capital Redemption Reserve Account– Fresh issue of shares – Arranging for cash balance for the purpose of redemption – minimum number of shares to be issued for redemption - issue of bonus shares – Post Bonus Issue Balancesheet (Schedule III to Companies Act2013) after redemption.		
Module No. 2: Mergers and Acquisition of Companies		16
Meaning of Amalgamation and Acquisition – Types of Amalgamation – Amalgamation in the nature of Merger – Amalgamation in the nature of Purchase - Methods of Calculation of Purchase Consideration (Ind AS 103), Net asset Method - Net Payment Method, Accounting for Amalgamation (Problems on pooling of interest method and purchase method) – Journal Entries and Ledger Accounts in the Books of Transferor Company and Journal Entries in the books of Transferee Company – Preparation of Balance Sheet after Merger. (Schedule III to Companies Act 2013).		
Module No. 3: Internal Reconstruction of Companies		10
Meaning of Capital Reduction; Objectives of Capital Reduction; Provisions for Reduction of Share Capital under Companies Act, 2013. Forms of Reduction. Accounting for Capital Reduction. Problems on passing Journal Entries, preparation of Capital Reduction Account and Balance sheet after reduction (Schedule III to Companies Act 2013).		
Module No. 4: Liquidation of Companies		12
Meaning of Liquidation, Modes of Winding up – Compulsory Winding up, Voluntary Winding up and winding up subject to Supervision by Court. Order of payments in the event of Liquidation. Liquidator’s Statement of Account. Liquidator’s remuneration. Problems on preparation of Liquidator’s Statement of Account.		
Module No. 5: Recent Developments in Accounting and Accounting Standards.		08

Human Resource Accounting – Environmental Accounting Discloser as per Global Reporting Initiative (GRI) Reporting of variables – Social Responsibility Accounting, Indian Accounting Standards- Meaning- objectives-Significance of Accounting standards in India- Process of setting Accounting Standards in India- List of Indian accounting standards. (IND AS).

Skill Development Activities:

1. List out legal provisions in respect of Redemption of Preference shares.
2. Calculation of Purchase consideration with imaginary figures.
3. List any five cases of amalgamation in the nature of merger or acquisition of JointStock Companies.
4. List out legal provisions in respect of internal reconstruction.
5. List out any five Indian Accounting Standards.

Note: Any other activities, which are relevant to the course.

Text Books:

1. Arulanandam & Raman ; Corporate Accounting-II, HPH
2. Anil Kumar.S Rajesh Kumar.V and Mariyappa.B Advanced Corporate Accounting, HPH
3. Dr. Venkataraman. R – Advanced Corporate Accounting
4. S.N. Maheswari , Financial Accounting, Vikas publishing
5. Soundarajan A & K. Venkataramana, Advanced Corporate Accounting, SHBP.
6. RL Gupta, Advanced Accountancy, Sultan Chand
7. K.K Verma – Corporate Accounting.
8. Jain and Narang, Corporate Accounting.
9. Tulsian, Advanced Accounting,
10. Shukla and Grewal – Advanced Accountancy, Sultan Chand
11. Srinivas Putty, Advanced Corporate Accounting, HPH.

Note: Latest edition of text books may be used.

Name of the Program: Bachelor of Commerce (B.Com.)		
Course Code: B.Com. 4.2		
Name of the Course: Costing Methods and Techniques		
Course Credits	No. of Hours per Week	Total No. of Teaching Hours
4 Credits	4 Hrs	56 Hrs
Pedagogy: Classroom lectures, Case studies, Tutorial classes, Group discussion & Seminar etc.,		
Course Outcomes: On successful completion of the course, the Students will be able to		
<ul style="list-style-type: none"> a) Understand the application of contract costing. b) Evaluate the benefits of process costing. c) Examine the importance and apply of service costing. d) Know the application of marginal costing. e) Prepare flexible and cash budget with imaginary figures & Analyze the processes involved in standard costing. 		
Syllabus:		Hours
Module No. 1: Contract Costing		12
Introduction - Meaning, features of contract costing, applications of contract costing, similarities and dissimilarities between job costing and contract costing, recording of contract costs, meaning of terms used in contract costing; treatment of profit on incomplete contracts-Problems.		
Module No. 2: Process Costing		12
Introduction - Meaning, features and applications of Process Costing; advantages and disadvantages of process costing; treatment of process losses and gains in cost accounts;, preparation of process accounts – Problems. (Except Joint and By-products and inter process profits)		
Module No. 3: Service Costing		10
Introduction to service costing; Application of Service costing; Service costing v/s product costing; Cost units for different service sectors; Service cost statement; Determination of costs for different service sectors - Transport services, Hospitals - problems on preparation of service cost statements for these service sectors.		
Module 4: Marginal Costing		12
Meaning and Definition of marginal cost, marginal costing, features of marginal costing- terms used in marginal costing – P/V ratio, BEP, Margin of Safety, Angle of Incidence. Break Even Analysis assumptions and uses. Break Even Chart. (Theory). Problems on CVP analysis.		

Module No 5:Standard Costing and Variance Analysis	10
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Standard Costing: Introduction–Uses and limitations, Variance analysis-Material variances, Labour variances and Overhead variances-problems on Material and Labour variances only.

Skill Development Activities:

1. Naming the appropriate method of costing with justification for each of the following Industries-Paper Mill, Printing, Sugar Mill, Rice Mill, Hospital, Oil Refinery, Pickle Manufacturing, KSRTC and Hotel.
2. List out the modern costing tools in accounting field.
3. Prepare flexible Budget and cash budget with imaginary figures
4. Narrate the steps involved in standard costing. System.
5. Prepare a report, which explains the conditions that are necessary for the successful implementation of a JIT manufacturing system.
6. Explain ABC. Illustrate how ABC can be applied.

Note: Any other activities, which are relevant to the course.

Text Books:

1. John K Shank and Vijaya Govindarajan; Strategic Cost Management; FreePress Publication; New York
2. S P Jain and K L Narang, Advanced Cost Accounting, Kalyani Publications,
3. Robert S Kaplan and Anthony A Atkinson, Advanced ManagementAccounting, PHI, New Delhi.
4. Shank and Govindrajan, Strategic Cost Management, Simon and Schuster,36 New York.
5. Lin Thomas, Cases and Readings in Strategic Cost Management, McGrawHill Publications, New York.
6. Mariyappa B Methods and Techniques of Costing. HPH.

Note: Latest edition of Text books may be used.

Name of the Program: Bachelor of Commerce (B.Com.)		
Course Code: B.Com. 4.3		
Name of the Course: Business Regulatory Framework		
Course Credits	No. of Hours per Week	Total No. of Teaching Hours
4 Credits	4 Hrs	56 Hrs
Pedagogy: Classroom lectures, Case studies, Tutorial classes, Group discussion, Seminar & fieldwork etc.,		
Course Outcomes: On successful completion of the course, the Students will be able to		
<ul style="list-style-type: none"> a) Recognize the laws relating to Contracts and its application in business activities. b) Acquire knowledge on bailment and indemnification of goods in a contractual relationship and role of agents. c) Comprehend the rules for Sale of Goods and rights and duties of a buyer and a seller. d) Distinguish the partnership laws, its applicability and relevance. e) Rephrase the cyber law in the present context. 		
Syllabus:		Hours
Module No. 1: Indian Contract Act, 1872		16
Introduction – Definition of Contract, Essentials of Valid Contract, Offer and acceptance, consideration, contractual capacity, free consent. Classification of Contract, Discharge of a contract, Breach of Contract and Remedies to Breach of Contract.		
Module No. 2: The Sale of Goods Act, 1930		10
Introduction - Definition of Contract of Sale, Essentials of Contract of Sale, Conditions and Warranties, Transfer of ownership in goods including sale by a non- owner and exceptions- Performance of contract of sale - Unpaid seller, rights of an unpaid seller against the goods and against the buyer.		
Module No. 3: Competition and Consumer Protection Act		12
The Competition Act 2002 – Objectives of Competition Act, Features of Competition Act, CAT, Offences and Penalties under the Act, Competition Commission of India.		
Consumer Protection Act 2019 – Introduction, Need for the new act - Objectives, Applicability, Definitions of the terms – Consumer, Consumer Dispute, Defect, Deficiency, Unfair Trade Practices, and Services, Rights of Consumer - Consumer Redressal Agencies – Structure of District Forum, State Commission and National Commission – Mediation cell – Central Consumer protection authority-E-filing of complaints- Product liability and penal consequences.		
Module No. 4: WTO Patent Rules		08
Indian Patent Act, 1970 – Meaning and Scope of Intellectual Property Rights (IPR), Procedure to get Patent for Inventions and Non-Inventions.		
Module 5: Environment and Cyber Laws		10

Environment Protection Act 1986 – Objectives of the Act, Definitions of Important Terms – Environment, Environment Pollutant, Environment Pollution, Hazardous Substance and Occupier, Types of Pollution, Powers of Central Government to protect Environment in India. **Cyber Law:** Definition, Introduction to Indian Cyber Law, Cyber space and Cyber Security.

Skill Development Activities:

1. Discuss the case of “Carlill vs Carbolic Smoke Ball Company” case
2. Discuss the case of “Mohori Bibee v/s Dharmodas Ghose”.
3. Discuss any one case law relating to minor.
4. State the procedure for getting patent for ‘inventions’ and / or ‘non-inventions’.
5. List at least 5 items which can be categorized as ‘hazardous substance’ according to Environment Protection Act.
6. List out any top upcoming jobs in cyber security and examine the skills required for the same.

Note: Any other activities, which are relevant to the course.

Text Books:

1. M.C. Kuchhal, and Vivek Kuchhal, Business Law, Vikas Publishing House, New Delhi.
2. Avtar Singh, Business Law, Eastern Book Company, Lucknow.
3. Ravinder Kumar, Legal Aspects of Business, Cengage Learning
4. SN Maheshwari and SK Maheshwari, Business Law, National Publishing House, New Delhi.
5. Aggarwal S K, Business Law, Galgotia Publishers Company, New Delhi
6. Bhushan Kumar Goyal and Jain Kinneri, Business Laws, International Book House
7. Sushma Arora, Business Laws, Taxmann Publications.
8. Akhileshwar Pathak, Legal Aspects of Business, McGraw Hill Education, 6th Ed.
9. P C Tulsian and Bharat Tulsian, Business Law, McGraw Hill Education
10. Sharma, J.P. and Sunaina Kanojia, Business Laws, Ane Books Pvt. Ltd., New Delhi
11. K. Rama Rao and Ravi S.P., Business Regulatory Framework., HPH
12. N.D. Kapoor, Business Laws, Sultan Chand Publications

Latest edition of text books may be used.

Name of the Program: Bachelor of Commerce (B.Com.)		
Course Code: B.Com. 4.6 (OEC)		
Name of the Course: Entrepreneurship Skills		
Course Credits	No. of Hours per Week	Total No. of Teaching Hours
3 Credits	3 Hrs	42 Hrs
Pedagogy: Classrooms lecture, Case studies, Tutorial classes, Group discussion & Seminar etc.,		
Course Outcomes: On successful completion of the course, the Students will be able to		
<ul style="list-style-type: none"> a) Discover their strengths and weaknesses in developing the entrepreneurial mind-set. b) Identify the different Government Institutions/Schemes available for promoting Entrepreneurs. c) Understand the various aspects to set-up Enterprises. d) Familiarize Mechanism of Monitoring and maintaining an Enterprises. e) Know the various features for successful/unsuccessful entrepreneurs. 		
Syllabus:		Hours
Module No. 1: Introduction		10
Need of becoming entrepreneur- ways to become a good entrepreneur-Enabling environment available to become an entrepreneur. Self-discovery, Idea Generation-Idea Evaluation-Feasibility analysis- Finding team-Preparation of business model.		
Module No. 2: Promoting Entrepreneur		08
Introduction-Different Government institutions/schemes promoting entrepreneurs: Gramin banks, PMMY-MUDRA Loan, DIC, SIDA, SISI, NSIC, and SIDO, etc.,		
Module No. 3: Enterprise Set-up		08
Introduction – Ways to set up an enterprise and different aspects involved: legal compliances, marketing aspect, budgeting etc.,		
Module No. 4: Monitoring and Maintaining an Enterprise		10
Introduction – Day to day monitoring mechanism for marinating an enterprise-Different Government Schemes supporting entrepreneurship.		
Module No. 5: Case Studies		06
Examples of successful and unsuccessful entrepreneur of MUDRA Loan, Gramin banks, SISI and NSIC etc., ,(at least one each example on entrepreneurs availed MUDRA loan, loan from Gramin banks etc.)		
Skill Development Activities:		
<ul style="list-style-type: none"> 1. List out the discovery and evaluation of viable business ideas for new venture creation. 2. Practice critical talents and traits required for entrepreneurs such as Problem solving, creativity, communication, business math, sales, and 		

negotiation

3. List out practical issues in setting-up of different enterprises.
4. Analyze the impact of various Government schemes in promotion of entrepreneurs.

Note: Any other activities, which are relevant to the course.

Text Books:

1. Entrepreneurship - Starting, Developing, and Management a new Enterprise –Hisrich and –Peters-Irwin
2. Fayolle A (2007) Entrepreneurship and new value creation. Cambridge, CambridgeUniversity Press
3. Hougard S. (2005) The business idea. Berlin, Springer
4. Lowe R & S Mariott (2006) Enterprise: Entrepreneurship & Innovation. Burlington, Butterworth Heinemann

Note: Latest edition of text books may be used.

Name of the Program: Bachelor of Commerce (B.Com.)		
Course Code: B.Com. 4.6 (OEC)		
Name of the Course: Corporate Governance		
Course Credits	No. of Hours per Week	Total No. of Teaching Hours
3 Credits	3 Hrs	42Hrs
Pedagogy: Class rooms lecture, Case studies, Tutorial classes, Group discussion, Seminar etc.,		
Course Outcomes: On successful completion of the course, the Students will be able to		
a) Identify the importance of corporate governance.		
b) Know the rights, duties and responsibilities of Directors.		
c) Analyse the legal & regulatory framework of corporate governance.		
d) Outline the importance and role of board committee.		
e) Understand the major expert committees' Reports on corporate governance.		
Syllabus:		Hours
Module No. 1: Corporate Governance		10
Introduction, Its importance, Principles of corporate governance, OECD Principles of corporate governance, Theories of corporate governance-Agency theory and stewardship theory, Models of corporate governance around the world, Need for good corporate governance - Evolution of Corporate Governance - Ancient and Modern Concept - Concept of Corporate Governance, Generation of Value from Performance - Principles of Corporate Governance.		
Module No. 2: Corporate and Board Management		10
Corporate Business Ownership Structure - Board of Directors - Role, Composition, Systems and Procedures - Fiduciary relationship - Types of Directors-Promoter/Nominee/Shareholder/Independent - Rights, Duties and Responsibilities of Directors; Role of Directors and Executives - Responsibility for Leadership, Harmony between Directors and Executives -Training of Directors-need, objective, methodology -Scope and Responsibilities and competencies for directors - Executive Management Process, Executive Remuneration - Functional Committees of Board - Rights and Relationship of Shareholders and Other Stakeholders.		
Module No. 3: Legal and Regulatory Framework of Corporate Governance		08
Need for Legislation of Corporate Governance - Legislative Provisions of Corporate Governance in Companies Act 1956, Securities (Contracts and Regulations) Act, 1956 (SCRA), Depositories Act 1996, Securities and Exchange Board of India Act 1992, Listing Agreement, Banking Regulation Act, 1949 and Other Corporate Laws - Legal Provisions relating to Investor Protection.		
Module No. 4: Board Committees and Role of Professionals		
Board Committees - Audit Committee, Remuneration Committee, Shareholders' Grievance Committee, other committees - Need, Functions and Advantages of Committee Management -Constitution and Scope of Board Committees - Board Committees' Charter - Terms of Reference and Accountability and Performance Appraisals - Attendance and participation in committee meetings - Independence		

of Members of Board Committees - Disclosures in Annual Report; Integrity of Financial Reporting Systems - Role of Professionals in Board Committees - Role of Company Secretaries in compliance of Corporate Governance.

Module No. 5: Corporate Governance - Codes and Practices

06

Introduction - Major Expert Committees' Reports of India - Study of Codes of Corporate Governance - Best Practices of Corporate Governance - Value Creation through Corporate Governance - Corporate Governance Ratings.

Skill Development Activities:

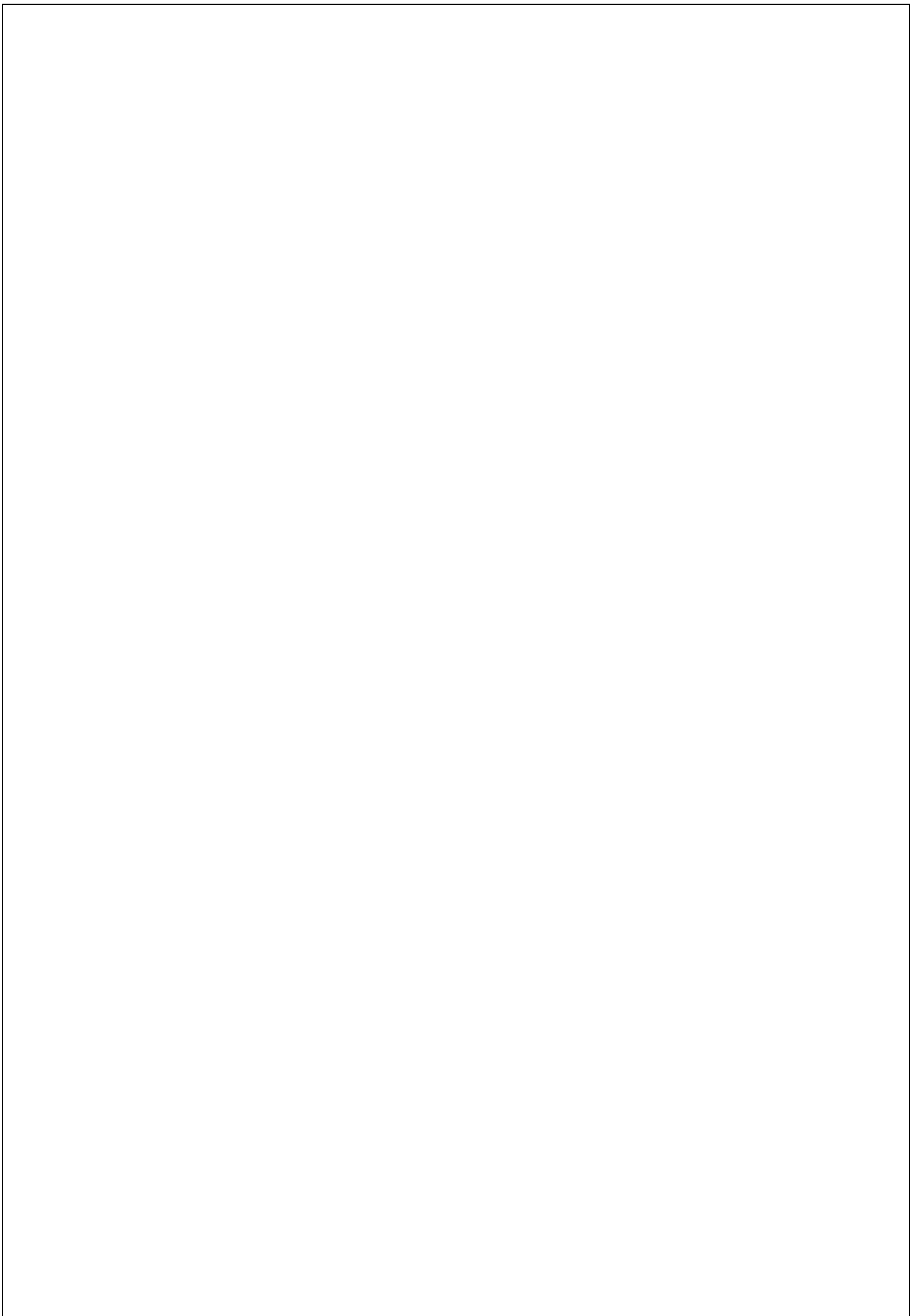
1. Collect the annual reports of any two companies, find out the corporate governance aspects in the reports.
2. Collect any two companies Board of Directors names and find out their nature of directorship.
3. Prepare report on the applicability of different models of Corporate Governance.
4. Critically compare the recommendations of various corporate governance committee.

Note: Any other activities, which are relevant to the course.

Text Books:

1. Bairs N. and D Band, Winning Ways through Corporate Governance, Macmillan London.
2. Charkham J, Keeping Good Company: A Study of Corporate Governance in Five Countries, Oxford University Press, London.
3. Subhash Chandra Das, Corporate Governance in India – An Evaluation (Third edition), PHI Learning Private Limited.
4. Clark T. and E Monk House, Rethinking the Company, Pitman, London.
5. Fernando A.C, Corporate Governance, Pearson Education.
6. Prentice D.D. and PRJ Holland, Contemporary Issues in Governance, Clarendon Press.
7. Report of the Cadbury Committee on Financial Aspects of Corporate Governance, London Stock Exchange, London.
8. Report on Corporate Governance, Confederation of India Industries and Bombay.

Note: Latest edition of text books may be used.





Kuvempu University

Department of Post-Graduate Studies and Research in Commerce

Jnana Sahyadri, Shankaraghatta 577 451 (Shivamogga District, Karnataka)

e-mail: commerce@kuvempu.ac.in

Minutes of the Meeting of Board of Studies in Commerce (UG) held on Friday, 29 December 2017 at 11 am in the DoS in Commerce, Kuvempu University, Jnana Sahyadri

Members:

- | | |
|-----------------------|----------------------------|
| (1) Sri Umapathi K G | (4) Smt V Shalini |
| (2) Sri Poornesh K | (5) Sri B Malleshi Naik |
| (3) Sri B R Dayananda | (6) J. Madegowda: Chairman |

After the formal welcome by the chairman, the Board took up the subjects listed in the Agenda for discussion and after discussion resolved appropriately as presented below.

(1) Review of Question Papers set for April/November 2017 examinations

The Board reviewed the question papers set for April/November 2017 examinations of B.Com (both regular and distance mode) and found them in order.

(2) Preparation and approval of Panels of Examiners for April/November 2018 examinations of B.Com (both regular and DDE)

The Board prepared and approved the Panels of Examiners for B.Com examinations, 2018 (both regular and distance mode), and authorized the Chairman to send the same to the Registrar (Eval) separately (**Appendix – 1**).

(3) Revision and approval of curricula of B.Com (regular) programme

The Board prepared and approved the thoroughly revised and comprehensive course curricula B.Com programme (Regular). Further, the Board resolved to recommend to the Faculty of Commerce for its consideration and approval (**Appendix – 2**).

(4) Any other subject with the permission of the Chairman: Question Papers

Members of the Board discussed the issue of translating the question papers of quantitative courses from English to Kannada from the points of view of its utility to the students, time and cost factors, and resolved to have the question papers of quantitative courses only in English.

Signature of Members:

- | | |
|----------------------|-------------------------|
| (1) Sri Umapathi K G | (3) Sri B R Dayananda |
| (2) Sri Poornesh K | (4) Sri B Malleshi Naik |

(J. Madegowda)

Chairman

Appendix - 2



Kuvempu University

Department of Post-Graduate Studies and Research in Commerce

Jnana Sahyadri, Shankaraghatta 577 451 (Shivamogga District, Karnataka)

e-mail: commerce@kuvempu.ac.in



B. Com Curricula, 2018-19

[prepared and approved by the Board of Studies in Commerce (UG) in its meeting held on
29 December 2017]



Structure of B.Com Programme

Sl. No.	Academic Programme, Semester and Title of the Course	Weekly Teaching Hours	Examination Duration (hours)	Maximum Marks		
				CAP ¹	SEE ²	Total
B.Com, Semester - I						
101	Language – I, Course - I	4	3	20	80	100
102	Language – II, Course – I	4	3	20	80	100
103	Financial Accounting – I	4	3	20	80	100
104	Business Environment and Government Policy	4	3	20	80	100
105	Principles of Business Management	3	3	20	80	100
106	Market Behaviour and Cost Analysis	4	3	20	80	100
Total, Semester - I				120	480	600
B.Com, Semester - II						
201	Language – I, Course – II	4	3	20	80	100
202	Language – II, Course – II	4	3	20	80	100
203	Financial Accounting – II	5	3	20	80	100
204	Human Resource Management	4	3	20	80	100
205	Mathematics for Business	4	3	20	80	100
206	Indian Financial System	4	3	20	80	100
Total, Semester - II				120	480	600
B.Com, Semester - III						
301	Language – I, Course – III	4	3	20	80	100
302	Language – II, Course – III	4	3	20	80	100
303	Corporate Accounting – I	4	3	20	80	100
304	Marketing Management	4	3	20	80	100
305	Small Business Management	4	3	20	80	100
306	Corporation Administration	4	3	20	80	100
307	Environmental Science	4	3	20	80	100
Total, Semester - III				140	560	700
B.Com, Semester - IV						
401	Language – I, Course – IV	4	3	20	80	100
402	Language – II, Course – IV	4	3	20	80	100
403	Corporate Accounting – II	5	3	20	80	100
404	Management of Banking Operations	4	3	20	80	100
405	Computer Applications in Business	4	3	20	80	100
406	Business Regulations	3	3	20	80	100
407	Indian Constitution	4	3	20	80	100
Total, Semester - IV				140	560	700

¹ Continuous Assessment Programme² Semester-end Examination

B.Com, Semester - V						
501	Financial Management	4	3	20	80	100
502	Income Tax – I	4	3	20	80	100
503	Business Statistics - I	4	3	20	80	100
504	Cost Accounting	4	3	20	80	100
505	Advanced Accounts	4	3	20	80	100
506	Goods and Services Tax	4	3	20	80	100
507	Specialization Stream, Course – I	4	3	20	80	100
508	Logical and Analytical Reasoning	2	1½	10	40	50
Total, Semester - V				150	600	750
B.Com, Semester - VI						
601	International Financial Reporting Standards	4	3	20	80	100
602	Income Tax – II	4	3	20	80	100
603	Business Statistics – II	4	3	20	80	100
604	Cost Accounting – Methods and Techniques	4	3	20	80	100
605	Management Accounting	5	3	20	80	100
606	Principles and Practice of Auditing	3	3	20	80	100
607	Specialization Stream, Course – II	4	3	20	80	100
608	Soft Skills	2	1½	10	40	50
Total, Semester - VI				150	600	750
Grand Total				820	3,280	4,100

Specialization Stream – A: Finance Stream

507A Advanced Financial Management

607A Security Analysis and Portfolio Management

Specialization Stream – B: Marketing Stream

507B Product and Sales Management

607B Retail Management

Specialization Stream – C: Banking and Insurance Stream

507C Advanced Bank Management

607C Life and General Insurance

Specialization Stream – D: E-Commerce Stream

507D E-Commerce – 1

607D E-Commerce – 2

Specialization Stream – E: Quantitative Techniques Stream

507E Quantitative Techniques – 1

607E Quantitative Techniques – 2

B.Com, Semester – I
Course – 103: Financial Accounting – I

Course Objective: To acquaint students with the accounting concepts, conventions, accounting process and preparation of Financial Statements

Pedagogy: Combination of lectures, assignments and group discussions

Weekly Teaching Hours: 4 Maximum Marks: 100 Examination Duration: 3 hours

Unit**Course Inputs**

- I. **Introduction to Financial Accounting** (6 hours): Introduction - Meaning and Definition; Objectives of Accounting; Functions of Accounting; Accounting Concepts and Accounting Conventions.
- II. **Final Accounts of Sole Trading Concerns** (12 hours): Financial Statements – Preparation of Manufacturing Accounts; Profit and Loss Account, and Balance Sheet with respect to current market conditions.
- III. **Consignment Accounts** (16 hours): Introduction, Meaning – Consignor, Consignee; Goods Invoiced at Cost Price, Goods Invoiced at Selling Price, Normal Loss, Abnormal Loss, Valuation of Stock, Stock Reserve, Journal Entries, Ledger Accounts in the Books of Consignor and Consignee.
- IV. **Accounting for Joint Ventures** (15 hours): Introduction, Meaning, Objectives, Distinction between Joint Venture and Consignment; Distinction between Joint Venture and Partnership; Maintenance of Accounts – when separate set of Books are maintained, and when separate set of Books are not maintained with Joint Bank Account and Problems.
- V. **Final Accounts of Non-profit Organizations** (15 hours): Meaning of Non-profit Organization, Need for maintaining Accounts, Financial Statements of Non-profit Organizations, Receipts and Payments Account, Income and Expenditure Account, and Balance Sheet. Capital and Revenue Items – Treatment of special Items, Preparation of Income and Expenditure Account, and Balance Sheet from Receipts and Payments Account and Problems.

Skill Development Activities:

- (1) Draft the specimen of various Subsidiary Books
- (2) Collect a Trial Balance from a Sole Trader and prepare Final Accounts
- (3) Prepare Proforma Invoice and Account Sales
- (4) Prepare Joint Venture Account with imaginary figures when joint bank account is maintained
- (5) Collect Receipts and Payment Account of a Non-trading Concern and prepare a note on the contents

Recommended Books for Reference:

- (1) J Madegowda and Dr Giridhar, K V, Financial Accounting (Volume – I), Himalaya Publishing House, Mumbai
- (2) Dr. B. Mariyappa, Anil Kumar – Advanced Financial Accounting, HPH
- (3) Arulanandam & Raman; Advanced Accountancy, HPH
- (4) Dr. Alice Mani: Advanced Financial Accounting, SBH.
- (5) Dr. S.N. Maheswari, Financial Accounting, Vikas Publication
- (6) S P Jain and K. L. Narang, Financial Accounting, Kalyani Publication

B.Com, Semester – I**Course – 104: Business Environment and Government Policy**

Course Objective: To acquaint students with the business environment and government policy

Pedagogy: Combination of lectures, assignments and group discussions

Weekly Teaching Hours: 4 Maximum Marks: 100 Examination Duration: 3 hours

Unit Course Inputs

- I. **Introduction to Business Environment** (14 hours): Meaning, Objectives of Business, Features of Business, Business Environment, Internal and External Environment - Economic Environment, Social Environment, Cultural Environment, Demographic Environment, Legal Environment, Technological Environment, and Emerging Scenario and Business Policy.
- II. **Business Ethic** (13 hours): Principles of Business Ethics, Unethical Practices and Good Ethics of Business; Social Responsibility of Business, Doctrine of Social Responsibility, Rational of Social Responsibility and Unfair Trade Practices.
- III. **Technology in Business** (12 hours): Introduction, Need and Importance, Technological Factors influencing Business, Benefits and Limitations of Modern Technology to Business.
- IV. **Business and Government** (12 hours): Introduction, Government Intervention and Economic Growth, Regulatory Growth, Promotional Growth, Inter Personal Growth and Planning Growth.
- V. **Business Policy** (13 hours): Importance of Business Policy, Essentials of Business Policy, Classifications of Business Policy, Production Policy, Personal Policy, Financial Policy and Marketing Policy.

Skill Development Activities:

- (1) Draw a Business Tree
- (2) Prepare a Partnership Deed
- (3) Prepare Memorandum and Articles of Association of any company
- (4) Discuss the impact of globalization on Indian Business and Industry
- (5) State the impact of technology on Indian Business

Recommended Books for Reference:

- (1) Dr. Aswathappa Essentials of Business, Himalaya Publishing House
- (2) Francis Cherunilam; Economic Environment Business, Prentice Hall of India
- (3) P. Subba Rao, International Business, HPH
- (4) Amarchand, Business and Government
- (5) Vivek Mittall, Business Environment
- (6) Raj Agarwal, Business Environment

B.Com, Semester – I**Course – 105: Principles of Business Management**

Course Objective: To acquaint students with the principles of managing of business concerns

Pedagogy: Combination of lectures, assignments and group discussions

Weekly Teaching Hours: 4 Maximum Marks: 100 Examination Duration: 3 hours

Unit Course Inputs

- I. **Nature and Functions of Management** (14 hours): Meaning and Definition, Functions and Scope of Management, Levels of Management, Management vs Administration; Scientific Management, Evolution of Management Thought, Contributions of F W Taylor, Henry Fayol, Elton Mayo, and C.K Prahlad; and

- Management as Science, Art and Profession.
- II. **Planning and Decision Making** (14 hours): Nature and Importance of Planning, Types, Steps involved in Planning, Planning Premises, Planning Process. Decision Making - Meaning, Role, Steps involved in Decision Making Process, Significance of Decision Making, and Guidelines for effective Decision Making.
 - III. **Organizing** (16 hours): Nature, Principles, Types, Structure of Organization, Line and Staff Organization, Formal vs Informal Organization, Delegation of Authority, Principles of Delegation, Barriers to effective Delegation, Guidelines for Making effective Delegation, Span of Control, Authority and Responsibility, Authority vs Power, and Forms of Organization Structure.
 - IV. **Directing, Motivation and Control** (10 hours): Meaning, Nature, Significance and Techniques of Directing: Motivation - Meaning and Importance; Control - Meaning, Steps in Control, Features of effective Control System, Controlling Tools and Techniques, and Essentials of Effective Control.
 - V. **Leadership and Modern Management Techniques** (10 hours): Meaning of Leadership, Leadership Styles and Importance of Leadership: Modern Management Techniques - MBO, MBE, TQM, ISO, Stress Management (only meaning of modern management techniques).

Skill Development Activities:

- (1) Draft an Organization Chart
- (2) Narrate the steps in Selection Process
- (3) List out F W Taylor's Principles of Management
- (4) Narrate the steps in effective Control System
- (5) Mention the features of Modern Management Techniques

Recommended Books for Reference:

- (1) Principles of Management, Koontz and O'Donnell
- (2) Business Management, Gupta C B, Sultan Chand
- (3) Principles and Practice of Management, Prasad L M, Sultan Chand
- (4) Management, Stoner A F and Freeman R.E, Prentice Hall
- (5) Professional Management, Theo Haimann
- (6) Management Concepts and Practice, B P Singh and T N Chhabra

B.Com, Semester – I

Course – 106: Market Behaviour and Cost Analysis

Course Objective: To acquaint students with the different dimensions of market behaviour and role of cost analysis in decision making

Pedagogy: Combination of lectures, assignments and group discussions

Weekly Teaching Hours: 4 Maximum Marks: 100 Examination Duration: 3 hours

Unit

Course Inputs

- I. **Firms and Decisions** (14 hours): Firms - Meaning and Goals, Profit Maximization vs Wealth Maximization Dynamics, Decision Making – Features, Process, Strategy, Tactical and Operational Decisions, Game Theory, and Problems.
- II. **Market Forces** (12 hours): Demand - Meaning, Law of Demand, Nature of Elasticity of Demand, Determinants of Elasticity of Demand, Derived Demand Relations. Demand Forecasting - Meaning and Methods (Problems on Trend Projection by Method Least Squares); Supply - Law of Supply, and Determinants of Supply.
- III. **Production and Cost Analysis** (16 hours): Production Function – Concept and Importance, Cost Analysis - Meaning of Short-run and Long-run Costs, Fixed and

Variable Costs, Explicit and Implicit Costs, Opportunity Cost and Incremental Costs (concepts only). Total Cost, Average Cost and Marginal Cost Behavior in Short-run and Long-run (including problems). CVP Analysis – Assumptions, Uses, P/V Ratio, BEP, BE Chart, Margin of Safety and Problems.

- IV. **Pricing Practices and Strategies** (12 hours): Price – Pricing, Pricing Policy, Objectives and Determinants of Pricing Policy, Pricing Methods - Marginal Cost Pricing, Target Rate Pricing, Product Line Pricing, Administered Pricing, Competitive Bidding, Dual Pricing, Transfer Pricing; Price Discrimination - Requirements, Types and Dumping Strategies; Pricing over Product Life Cycle - Skimmed Pricing, Penetration Pricing, Product Line Pricing and Price Leadership; Linear Programming Problems – Problems on Profit Maximization and Cost Minimization using Graphic Method with two Variables.
- V. **Location of a Firm** (10 hours): Locating the Firm, Basic Principles, Selecting an Industrial Location, Primary and Secondary Factors; Sources of Capital, Internal and External Sources; Risk and Uncertainty – Concepts, and Investment Decisions under Uncertainty (Models).

Skill Development Activities:

- (1) A case study on decision making under market uncertainties
- (2) A practical example with graphical presentation of Elasticity of Demand
- (3) Construct a table with imaginary figures showing the relationship of Fixed Cost, Variable Cost, Total Cost, Average Fixed Cost, Average Variable Cost, Average Cost and Marginal Cost.
- (4) Practical analysis of product life cycle of a product
- (5) List out factors to be considered for location of a new firm

Recommended Books for Reference:

- (1) Dr. B. Mariyappa: Market Behaviour and Cost Analysis, Himalaya Publishing House, New Delhi
- (2) P L Mehta: Managerial Economics, Sultan Chand & Sons, New Delhi
- (3) D. M. Mithani: Managerial Economics, Himalaya Publishing House, New Delhi
- (4) R. L Varshney and K.L Maheshwari: Managerial Economics, Sultan Chand & Sons, New Delhi
- (5) H. L Ahuja: Business Economics, S. Chand & Company Ltd., New Delhi
- (6) Reddy and Appananiah: Economics for Business
- (7) K. M. Pandey and others: Economics for Managerial Decisions
- (8) K P M Sundaram: Micro Economics, Sultan Chand & Sons, New Delhi
- (9) M L Jhingan & J K Stephen: Managerial Economics, Vrinda Publishing (P) Ltd, Delhi.
- (10) Manoj Kumar Mishra: Managerial Economics, Voyu Education of India, New Delhi

B.Com, Semester – II

Course – 203: Financial Accounting – II

Course Objective: To acquaint students with the different accounting practices in the company

Pedagogy: combination of lectures, assignments and group discussions

Weekly Teaching Hours: 4 Maximum Marks: 100 Examination Duration: 3 hours

Unit

Course Inputs

- I. **Hire Purchase System** (16 hours): Meaning of Hire Purchase and Installment Purchase System; Differences between Hire Purchase and Installment Purchase, Important Definitions – Hire Purchase Agreement, Hire Purchase Price, Cash Price,

- Hire Purchase Charges, Net Hire Purchase Price, Net Cash Price; Calculation of Interest, Calculation of Cash Price; and Journal Entries and Ledger Accounts in the books of Hire Purchaser and Hire vendor (Asset Accrual Method only).
- II. **Departmental Accounts** (8 hours): Meaning, Objectives, Basis of Allocation of Expenses, Trading and Profit and Loss Account in Columnar Form and Balance Sheet.
 - III. **Branch Accounts** (14 hours): Introduction, Meaning, Objectives, Types of Branches - Dependent Branches, Features; Supply of Goods at Cost Price and Invoice Price; Branch Account in the books of Head Office, Debtors System only and Problems.
 - IV. **Fire Insurance Claims** (10 hours): Introduction, Need, Steps for ascertaining Fire Insurance Claim, Treatment of Salvage, Average Clause, Treatment of Abnormal Items, Computation of Fire Insurance Claims and Problems on Loss of Stock.
 - V. **Royalty Accounts** (16 hours): Meaning and Definition, Technical Terms – Royalty, Landlord, Tenant, Minimum Rent, Short Workings, Recoupment of Short Working, Recoupment within the life of the Lease, Treatment of Strike and Stoppage of Work, Accounting Treatment in the books of Lessee and Lessor, and Journal Entries and Ledger Accounts including Minimum Rent Account.

Skill Development Activities:

- (1) Collect Hire Purchase Agreement – analyze and prepare a note on the same
- (2) List out the basis of apportionment of common expenses
- (3) Collect transactions relating to any branch and prepare a Branch Account
- (4) Prepare a Claim Statement with imaginary figures to submit to insurance company
- (5) Collect Royalty Agreement with regard to any suitable situation – analyze and prepare a note on the same

Recommended Books for Reference:

- (1) J Madegowda and Dr Giridhar, K V, Advanced Financial Accounting (Volume – II), Himalaya Publishing House, Mumbai
- (2) Dr. B. Mariyappa, Advanced Financial Accounting, HPH
- (3) Arulanandam and Raman, Financial Accounting – I, HPH
- (4) Dr. S. N. Maheswari: Financial Accounting, Vikas Publications
- (5) S P Jain and K. L. Narang, Financial Accounting - I, Kalyani Publishers
- (6) Radhaswamy and R. L. Gupta, Advanced Accounting , Sultan Chand
- (7) Soundarrajan and K. Venkataramana, Financial Accounting, SHBP

B.Com, Semester – II

Course – 204: Human Resource Management

Course Objective: To acquaint students with different dimensions of HRM in the organizations

Pedagogy: Combination of lectures, assignments and group discussions

Weekly Teaching Hours: 4 Maximum Marks: 100 Examination Duration: 3 hours

Unit

Course Inputs

- I. **Introduction to Human Resource Management** (12 hours): Meaning and Definition of HRM, Evolution of HRM in India, Scope, Objectives, Concepts, Functions and its Strategic Role, and Recent trends in HRM and HRD.
- II. **Employment and Development** (12 hours): Human Resource Planning, Job Analysis and Job Design, and Recruitment and Selection Process including E–Recruitment and Selection.
- III. **Executive Development** (14 hours): Meaning of Training, Need for Training, Importance, Steps in Training Programme, Methods of Training. Performance

Appraisal – Terminology Used, Evaluation Process, Methods and Problems.

- IV. **Compensation Management** (14 hours): Meaning, Nature and Purpose, Wage Levels and Structures, Wage Determination Process, Theory of Wages, Principles and Factors influencing Wage and Salary Structure and Administration, Rewards and Incentives.
- V. **Human Relations** (12 hours): Meaning, Importance, Objectives, Motivation Theories, Employee Morale, Communication, Leadership, Employee Welfare, Health and Safety, Maintenance of HR Data Base, Challenges and Opportunities in Globalized Era, and Outsourcing of HR Functions.

Skill Development Activities:

- (1) Draft an advertisement for recruitment of candidates for an organization
- (2) Prepare a report for training procedure followed in an organization of your choice
- (3) Draft a format of performance appraisal of an employee
- (4) List out wage and salary structure of any five companies
- (5) Write a model of pay roll accounting of a company of your choice
- (6) List out the measures provided under Labour Act for employee welfare, health and safety

Recommended Books for Reference:

- (1) Dr. K. Ashwathappa, Human Resource Management – HPH
- (2) Dr. Appanaiah, Human Resource Management, HPH
- (3) Rao and T.V. Verma, Human Resource Development
- (4) Jean Marleen, Performance Oriented Human Resource Development
- (5) Lalitha Balakrishna and Others, Human Resource Development

B.Com, Semester – II

Course – 205: Mathematics for Business

Course Objective: To acquaint students with the application of mathematical techniques in modern business

Pedagogy: Combination of lectures, assignments and group discussions

Weekly Teaching Hours: 4 Maximum Marks: 100 Examination Duration: 3 hours

Unit **Course Inputs**

- I. **Theory of Indices** (6 hours): Introduction, Meaning of Index, Basic Laws of Indices (statement only), Definition of Zero Index, Fractional Index and Negative Index and Problems on Simplification.
- II. **Progressions** (8 hours): Arithmetic Progression, Finding the n^{th} Term of AP and Sum to n^{th} Term of AP; Insertion of Arithmetic Mean; Geometric Progression – Finding the n^{th} Term of GP and Sum to n^{th} Term GP and Insertion of Geometric Mean.
- III. **Mathematics of Finance, Ratios, Proportions and Variations** (14 hours): Simple Interest, Problems on Simple Interest, Compound Interest, Annuities, Present and Future Value of Annuity, Discounting Bills of Exchange (Present Worth, Future Face Value, Trade Discount and Banker Discount, Bankers Gain and Amount Receivable); Equality of Ratios; Proportions – Fourth Proportional – Third Proportional and Mean Proportional – Continued Proportion, Direct and Inverse Proportions, Problems; Variations - Problems on Speed, Time and Work Completion.
- IV. **Theory of Sets** (10 hours): Meaning, Elements of a Set, Methods of Describing a Set, Types of Sets and Operations, Demargan's Laws Venn Diagram and their Application to Theory of Sets.
- V. **Theory of Equations** (14 hours): Simple Linear Equations, Simultaneous Linear Equation (Elimination, Substitution and Cross Multiplication Methods only),

Quadratic Equation, Pure Quadratic, General Form of Quadratic Equations, Factorization and Sridharacharya's Methods and Problems.

- VI. **Matrices and Determinants** (12 hours): Meaning of Matrix, Types of Matrices, Operations of Addition, Subtraction and Multiplication of Matrices, Problems, Transpose of A Matrix, Determinants of a Square Matrix, Minor of an Element, Co-Factor of an Element, Ad Joint of a Square Matrix, Singular and Non-singular of a Square Matrix, Inverse of a Square Matrix. Solutions of System of Linear Equations in two Variables using Cramer's Rule and Problems.

Skill Development Activities:

- (1) Collect details from your nearest trading concern regarding normal discount and prepare a note on the same
- (2) Collect information from a financial company or firm regarding rate of interest charged on advances and deposits and how the bills are discounted by the business firms and banks - prepare a note on the same
- (3) Develop an amortization table for loan amount – EMI Calculation
- (4) Secondary Overhead Distribution Summary using Simultaneous Equations Method
- (5) Preparation of Bank Statement
- (6) Application of Matrix in business problems

Recommended Books for Reference:

- (1) Dr. Sancheti & Kapoor: Business Mathematics and Statistics, Sultan Chand
- (2) Zamarudeen: Business Mathematics, Vikas
- (3) R.S Bhardwaj :Mathematics for Economics & Business
- (4) Madappa, Mahadi Hassan, M. Iqbal Taiyab, Business Mathematics
- (5) G.R. Veena and Seema, Business Mathematics and Statistics, I. K. Intl Publishers

B.Com, Semester – II

Course – 206: Indian Financial System

Course Objective: To acquaint students with the requisite knowledge about present Indian Financial System

Pedagogy: Combination of lectures, assignments and group discussions

Weekly Teaching Hours: 4 Maximum Marks: 100 Examination Duration: 3 hours

Unit

Course Inputs

- I. **Introduction to Financial System** (12 hours): Meaning, Role and Classification of Financial System, Organizational Structure of Indian Financial System, Major Components - Financial Institutions, Intermediaries and Financial Instruments.
- II. **Financial Markets in India** (16 hours): Capital Market, Role and Importance, Development Initiatives and Reforms – Narasimham Committee Reports 1991 and 1998; Primary Market - Meaning, Instruments, Players and Problems; Secondary Market – Meaning, Function; Stock Exchange, Listing of Securities and Benefits, Types of Securities, Types of Dealings. Indian Stock Exchange (BSE, NSE, OTCET) Online Trading, and Demat Accounting.
- III. **Money Market and Regulatory Institutions** (12 hours): Meaning, Features, Organized and Unorganized Money Market Instruments – Treasury Bills, Certificate of Deposits, Commercial Papers, Call Money, Commercial Bills; Emerging Structure of Indian Money Market; Reserve Bank of India (RBI) - Objectives and Functions; Monetary Policy of RBI, SEBI and IRDI – Role and Functions.
- IV. **Co-operative Banking and Non-Banking Financial Institutions** (12 hours): Evaluation of Co-operative as Financial Institutions in India, Structure, Role and

Importance of Co-operative Banks, Agricultural and Non-agricultural Co-operative Banks, NBFIs – Importance, Role and Types of NBFIs In India, IDBI, ICICI, SFCs, SIDCs, LIC And NABARD.

- V. **Financial Services** (12 hours): Meaning, Importance of Financial Services, Insurance, Mutual Funds, Lease Finance, Merchant Banking, Venture Capital Financing, Factorizing, Credit Rating Agencies, Micro Finance and Self Help Groups, Financial Inclusion Programs in India.

Skill Development Activities:

- (1) Draft a chart showing the financial services in the Indian Financial System
- (2) List the instrument traded in the financial markets
- (3) Collect and record the foreign exchange rates of different currencies
- (4) Collect the different schemes of mutual funds offered by various financial institutions
- (5) Make a list of institutions providing housing and vehicle finance in your area

Recommended Books for Reference:

- (1) Principles of Bank Management by Vasantdesai, Himalaya Publishing House
- (2) Indian Financial System by Bharti, Pathak, Pearson Education
- (3) Financial Markets and Services, E. Gordon and K. Natarajan, Himalaya Publishing House
- (4) Indian Financial System, K Gupta, N. Garwal, Kalyani Publications.
- (5) The Indian Financial System – Markets, Institutions, and Services, Pearson, New Delhi
- (6) Financial Institutions and Markets, Growth and Innovation, Bhole L. M: Tata McGraw-Hill, New Delhi

B.Com, Semester – III

Course – 303: Corporate Accounting – I

Course Objective: To acquaint students with the procedure of preparing the accounts of corporate enterprises with the help of principles and regulations

Pedagogy: combination of lectures, assignments and group discussions

Weekly Teaching Hours: 4 Maximum Marks: 100 Examination Duration: 3 hours

Unit **Course Inputs**

- I. **Profit Prior To Incorporation** (10 hours): Meaning, Calculation of Time Ratio, Sales Ratio and Weighted Ratio, Treatment of Capital and Revenue Expenditure, and Ascertainment of Pre-incorporation and Post-incorporation Profit by preparing Profit and Loss Account and Balance Sheet.
- II. **Valuation of Shares** (8 hours): Meaning, Need for Valuation of Shares, Factors affecting Valuation of Shares, Methods of Valuation - Intrinsic Value Method, Yield Method & Earning Capacity Method and Calculation of Fair Value of Shares.
- III. **Valuation of Goodwill** (8 hours): Meaning, Circumstances of Valuation of Goodwill, Factors influencing the Value of Goodwill, Methods of Valuation of Goodwill - Average Profit Method, Super Profit Method, Capitalization of Average Profit Method, Capitalization of Super Profit Method, and Annuity Method and Problems.
- IV. **Company Final Accounts** (20 hours): Statutory Provisions regarding preparation of Company Final Accounts, Treatment of Special Items – Tax Deducted at Source, Advance Payment of Tax, Provision for Tax, Depreciation, Interest on Debentures; Dividends – Rules regarding payment of Dividends, Transfer to Reserves; Preparation of Profit and Loss Account, and Balance Sheet in Vertical Form (as per Companies Act, 2013).
- V. **Underwriting of Shares and Debentures** (12 hours): Meaning, Underwriting

Commission; Underwriter – Functions, Advantages of Underwriting, Types of Underwriting – Marked and Unmarked Applications; – Problems on Underwriting including Firm Underwriting.

- VI. **Recent Trends in Company Accounts** (6 hours): Buy Back of Shares, Issue of Bonus Shares and Right Issue and Problems

Skill Development Activities:

- (1) Collect and fill the share application form of a limited company
- (2) Collect Prospectus of a company and identify its salient features, and prepare a note on the same
- (3) Collect annual report of a company and List out its assets and Liabilities
- (4) Collection of latest final accounts of a company and find out the intrinsic value of shares
- (5) Collect the annual reports of company and calculate the value of goodwill under different methods

Recommended Books for Reference:

- (1) J Madegowda, Dr Giridhar, K V, and Inchara P M Gowda, Corporate Accounting (Financial Accounting, Volume – III), Himalaya Publishing House, Mumbai
- (2) Dr. B. Mariyappa, Corporate Accounting, HPH
- (3) Arulanandam & Raman, Corporate Accounting – II
- (4) Dr. S. N. Maheswari, Financial Accounting
- (5) S. P. Jain and K. L. Narang, Corporate Accounting
- (6) S. Bhat- Corporate Accounting
- (7) S P Iyengar, Advanced Accountancy, Sultan Chand
- (8) R L Gupta, Advanced Accountancy
- (9) Shukla and Grewal, Financial Accounting

B.Com, Semester – III

Course – 304: Marketing Management

Course Objective: To acquaint students with different dimensions of present day marketing management

Pedagogy: Combination of lectures, assignments and group discussions

Weekly Teaching Hours: 4 Maximum Marks: 100 Examination Duration: 3 hours

Unit

Course Inputs

- I. **Introduction to Marketing** (10 hours): Meaning and Definition, Goals, Concepts of Marketing, Approaches to Marketing and Functions of Marketing.
- II. **Marketing Environment** (Macro) (10 hours): Meaning, Demographic, Economic, Natural, Technological, Political, Legal, and Socio-Cultural Environment.
- III. **Marketing Mix** (22 hours): Meaning, Elements, Product, Product Mix, Product Line, Product Lifecycle, Product Planning, New Product Development, Failure of new Product; Branding, Packing and Packaging; Pricing – Objectives, Factors influencing Pricing Policy and Methods of Pricing; Physical Distribution – Meaning, Factors affecting Channel Selection, Types of Marketing Channels; Promotion – Meaning and Significance of Promotion, Personal Selling and Advertising.
- IV. **Market Segmentation and Consumer Behavior** (10 hours): Meaning and Definition, Bases of Market Segmentation, Requisites of Sound Market Segmentation; Consumer Behaviour – Factors influencing Consumer Behaviour and Buying Decision Process.
- V. **Customer Relationship Management and Recent Trends in Marketing** (12 hours): Meaning and Definition, Role of CRM, Advantages and Disadvantages, Consumer

Protection Act 1986 and Recent Trends in Marketing; e-Business –Tele-Marketing, M-Business, Green Marketing, Relationship Marketing; Retailing – Concept Marketing and Virtual Marketing.

Skill Development Activities:

- (1) Identify the product of your choice and describe in which stage of the product life cycle it is positioned
- (2) Suggest strategies for development of a product
- (3) Study of consumer behavior for a product of your choice
- (4) Develop an advertisement copy for a product
- (5) Prepare a chart for distribution network for different products

Recommended Books for Reference:

- (1) Philip Kotler, Marketing Management
- (2) Bose Biplab, Marketing Management
- (3) Bholanath Datta, Marketing Management
- (4) J.C. Gandhi, Marketing Management
- (5) Ramesh and Jayanti Prasad: Marketing Management, I.K. International
- (6) Stanton W.J. Michael and Walker, Fundamentals of Management.
- (7) P N Reddy and Appannaiah, Marketing Management
- (8) Sontakki, Marketing Management

B.Com, Semester – III

Course – 305: Small Business Management

Course Objective: To acquaint students with different aspects managing small business units

Pedagogy: combination of lectures, assignments and group discussions

Weekly Teaching Hours: 4 Maximum Marks: 100 Examination Duration: 3 hours

Unit

Course Inputs

- I. **Introduction** (10 hours): Meaning of Small Business, Small Business Management, Importance, Role, Characteristics and Types of Small Business, Scope and Role of Government in promoting Micro, Small Scale Industries.
- II. **Woman Entrepreneurs** (12 hours): Concept, Types of Woman Entrepreneurs, Suitability of Business, Problems faced by Woman Entrepreneurs in India, Measures taken by the Governments for the development of Woman Entrepreneurs.
- III. **Rural Entrepreneurs** (10 hours): Definitions, Risk faced by Rural Entrepreneurs, Strategies for development of Rural Entrepreneurship, and Scope of Rural Entrepreneurship.
- IV. **Project Identification and Formulation** (12 hours): Meaning of Project, Project Identification and Project Reports, Importance of Project Report, Contents of Project Report, and General Format of Project Report.
- V. **Problems of Small Scale Industries** (12 hours): Types of Problems, Causes and Remedies, Sickness in Small Scale Industries, Symptoms, Reasons for Sickness and Remedial Measures.
- VI. **Institutions engaged in Financing Small Business** (8 hours): SIDBI, ICICI, DICs, IDBI, KSFC, RRBs, NABARD, Commercial Banks and their Functions.

Skill Development Activities:

- (1) Visit five small scale units in your area and collect the details regarding the nature of business, sources of capital, employees and raw materials – prepare a note
- (2) Visit DIC and list out the schemes of Government of Karnataka for rural industries
- (3) Visit the financial institutions in your area and collect the information about the loan

- sanctioned by them
- (4) Collect the details about the institutions engaged in providing training for small entrepreneurs
 - (5) Prepare a simple project report required to start a small unit

Recommended Books for Reference:

- (1) Entrepreneur Development, K Natarajan
- (2) Small Scale Industries and Entrepreneurship, Vasant Desai
- (3) Small Scale Industries and Entrepreneurship, S. V Murthy
- (4) Entrepreneurial Development, Arora

B.Com, Semester – III

Course – 306 Corporate Administration

Course Objective: To familiarize students with the essentials of corporate administration

Pedagogy: Combination of lectures, assignments and group discussions

Weekly Teaching Hours: 4 Maximum Marks: 100 Examination Duration: 3 hours

Unit

Course Inputs

- I. **Introduction to Indian Companies Act, 1956** (14 hours): Company –Definition and Characteristics, Kinds of Companies - Private, Public Company, Statutory Company, Foreign Company, Holding Company, Subsidiary Company, and Licensed Companies, Government Company, Foreign Company, Global Company, Listed Company, Body Corporate, Corporate Veil and Lifting of Corporate Veil.
- II. **Formation of a Company**(14 hours) Promoter - Meaning, Functions, Fiduciary Position and Remuneration, Stages Involved in formation (in brief), Basic Documents of a Company - Memorandum Association, Articles of Association, Prospectus, and Statement in Lieu of Prospectus, and Misleading Prospectus and its Consequences.
- III. **Corporate Administration** (8 hours): Company Secretary – Meaning and Definition of Company Secretary, Legal Position, Qualification and Appointment, Duties, Rights and Liabilities of a Company Secretary; Managing Director - Qualification, Powers, Duties and Liabilities.
- IV. **Shares and Membership of a Company Equity** (16 hours): Shares, Kinds of Shares - Equity Shares, (including Sweat Equity Shares) and Preferences Shares Issue and Allotment of Shares, Legal Rules for Allotment of Shares, Essentials of Valid Allotment, Shares Certificate – Physical Form and Electronic Form, Buyback of Shares – Legal Provisions Relating to Buy Back of Shares; Transfer and Transmission of Shares – Distinction, Electronic Transfer, Demat Account, Membership - Member and Share Holder – Distinction, Mode of Acquiring Membership, and Register of Members - Contents And Closer.
- V. **Corporate Meetings** (8 hours): Meetings and Types – Statutory Meeting, Board Meetings, Annual General Meeting, Extra-Ordinary General Meeting – Statutory Requirements of Valid Meeting - Notice of a Meeting, Agenda, Quorum, Proxy, Resolutions–Ordinary and Special Resolutions, and Distinction Between Ordinary and Special Resolutions; and Meaning of Minutes and its Contents.
- VI. **Highlights of Company Act 2013** (4 hours): New Concepts – One-man Company, Women Director, Corporate Social Responsibility and Other Amendments (brief).

Skill Development Activities:

- (1) Drafting of Memorandum of Association
- (2) Drafting of Articles of Association

- (3) Draft the following – Notice of annual general meeting, Extra ordinary general meeting and board meetings
- (4) Drafting resolutions of meetings - Annual general meeting, extra ordinary general meeting
- (5) Collect and fill Demat account opening form

Recommended Books for Reference:

- (1) Company Law and Secretarial Practice – M.C. Kuchal
- (2) Company Law and Secretarial Practice- N. D. Kapoor
- (3) Elements of Corporate Law, S.N Maheshwari
- (4) Corporate administration- K Venkataramana
- (5) The companies Act 2013, Taxman
- (6) Business Law- B.S Raman
- (7) Corporate Administration Dr. B.G Bhaskar, K.R Mahesh Kumar

B.Com, Semester – III

Course – 307: Environment Science

Course Objective: To acquaint students with the ecological structure of environment

Pedagogy: Combination of lectures, assignments and group discussions

Weekly Teaching Hours: 4 Maximum Marks: 100 Examination Duration: 3 hours

Unit

Course Inputs

- I. **The Multidisciplinary Nature of Environmental Studies** (2 hours): Meaning, Definition, Scope and Importance, and Need for Public Awareness.
- II. **Natural Resources** (8 hours): Renewable and Non-Renewable Resources; Natural Resources and Associated Problems; Forest Resources - Use and Over-exploitation, Deforestation, Case Studies; Timber Extraction, Mining Dams and their effects on Forests and Tribal People; Water Resources - Use and Over-utilization of Surface and Ground Water, Floods, Drought, Conflicts over Water; Dams - Benefits and Problems; Mineral Resources - Use and Exploitation, Environmental effects of Extraction and using Mineral Resources, Case Studies; Food Resources - World Food Problems, Changes caused by Agriculture and Overgrazing, Effects of Modern Agriculture, Fertilizer-Pesticide Problems, Water Logging, Salinity, Case Studies; Energy Resources - Growing Energy Needs, Renewable and Non-Renewable Energy Sources, Use of Alternate Energy Sources, Case Studies; Land Resources - Land as a Resource, Land Degradation, Man-induced Landslides, Soil Erosion and Desertification, Role of an individual in Conservation of Natural Resources; and Equitable Use of Resources for Sustainable Lifestyles.
- III. **Ecosystems** (6 hours): Concept of an Ecosystem, Structure and Function of an Ecosystem, Producers, Consumers and Decomposers, Energy Flow in the Ecosystem, Ecological Succession, Food Chains, Food Webs and Ecological Pyramids, Introduction, Types, Characteristic Features, Structures and Functions of the Following Ecosystem - Forest Ecosystem, Grassland Ecosystem, Desert Ecosystem, Aquatic Ecosystem (Ponds, Streams, Lakes, Rivers, Oceans, Sanctuaries).
- IV. **Biodiversity and its Conservation** (8 hours): Introduction, Definition, Genetic, Species and Ecosystem Diversity, Biogeographically Classification of India, Value of Biodiversity, Consumptive Use, Productive Use, Social Ethical Aesthetic and Option Values; Biodiversity at Global, National and Local Levels; India as a Mega-Diversity Nation; Hot-Spots of Biodiversity; Threats to Biodiversity; Habitual Loss, Poaching of Wildlife, Man-Wildlife Conflicts, Endangered and Endemic Species of India,

Conservation of Biodiversity, in-Situ and Ex-Situ Conservation of Biodiversity.

- V. **Environmental Pollution** (8 hours): Meaning, Definition, Causes, Effects and Control Measures of Air Pollution, Water Pollution, Soil Pollution, Marine Pollution, Noise Pollution, Thermal Pollution, and Nuclear Pollution; Solid Waste Management - Causes, Effects and Control Measures of Urban and Industrial Wastes; Role of an individual in prevention of Pollution, Pollution Case Studies; Disaster Management - Floods, Earthquake, Cyclone and Landslides.
- VI. **Social Issues and the Environment** (12 hours): From Unsustainable to Sustainable Development, Urban Problems related to Energy. Water Conservation, Rain Water Harvesting, Water Shed Management, Resettlement and Rehabilitation of People - Its Problems and Concern, Case Studies; Environmental Ethics - Issues and Possible Solutions, Climate Change, Global Warming, Acid Rain Ozone Layer Depletion, Wasteland Reclamation Consumerism and Waste Products, Environment Protection Act, Air (Prevention and Control of Pollution) Act, Water (Prevention and Control of Pollution) Act, Wild Life Protection Act, Forest Conservation Act, Issues involved in Enforcement of Environmental Legislation, and Public Awareness.
- VII **Human Population and the Environment** (6 hours): Population Growth, Variation among Nations, Population Explosion – Family Welfare Programme, Environment and Human Health, Human Rights, Value Education, HIV/AIDS, Women and Child Welfare, Role of Information Technology in Environment and Human Health, and Case Studies

Skill Development Activities:

- (1) Visit to a local polluted site -urban/rural/industrial/agriculture
- (2) Visit to local area to document environmental assets – rivers/forests/grassland/hill/mountain
- (3) Study of common plants, insects, birds
- (4) Study of simple ecosystems - pond, river, hill, slopes etc (field work equal to 5 lecture hours)
- (5) Each student has to submit a field report on any one of the above topics which forms the basis for evaluation of field work

Recommended Books for Reference:

- (1) Aggarwal K.C, Environmental Biology, Nidhi Publications Ltd, Bikaner
- (2) Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd
- (3) Brunnet R.C, Hazardous Waste incineration, McGraw Hill Inc
- (4) Clark R.S. marine Pollution, Canderson Press, Oxford (TB)
- (5) De A.K. Environmental Chemistry, Wiley Eastern ltd.
- (6) Down to Earth, Centre for Science and Environment
- (7) Gleick H.P, Water in Crisis, Pacific Institute for Studies in Dev. Environment and Security, Stockholm Env. Instt, Oxford Univ. Press
- (8) Hawkins R.E. Encyclopedia of Indian Natural History, Bombay Natural History Society, Bombay
- (9) Heywood VII and Watson, R.T. 1995, Global Biodiversity Assessment, Cambridge Univ. Press
- (10) Jadhav II and Bhosale V.M. 1995, Environmental Protection Laws, Himalaya Publishing House, Delhi
- (11) Sharma B.K. 2001, Environmental Chemistry, Goel Pub. House, Meerut
- (12) Trivedi. R.K, Handbook of Environmental Laws Rules, Guidelines, Compliances and Standards Vol I and II Enviro Media

(13) Wagner K.D, Environmental Management, W.B. Saunders Co Philandering, USA

B.Com, Semester – IV

Course – 403: Corporate Accounting – II

Course Objective: To enable the students to understand principles and procedure of preparing accounts of specialized corporate sectors

Pedagogy: Combination of lectures, assignments and group discussions

Weekly Teaching Hours: 5 Maximum Marks: 100 Examination Duration: 3 hours

Unit

Course Inputs

- I. **Liquidation of Companies** (8 hours): Meaning, Types of Liquidation, Order of Payment, Calculation of Liquidator's Remuneration, and Preparation of Liquidators Final Statement of Account.
- II. **Banking Company Final Accounts** (16 hours): Business of Banking Companies, Some Important Provisions of Banking Regulation Act of 1949 – Minimum Capital and Reserves, Restriction on Commission, Brokerage, Discounts, Statutory Reserves – Cash Reserves, Books of Accounts, Special features of Bank Accounting, Final Accounts - Balance Sheet and Profit and Loss Account – Interest on Doubtful Debts – Rebate on Bill Discounted, Acceptance, Endorsement and other Obligations and Problems as per New Provisions
- III. **Life Insurance Company Final Accounts** (20 hours): Meaning of Life Insurance, Accounting Concepts relating to Insurance Companies, Preparation of Final Accounts of Life Insurance Companies – Revenue Account and Balance Sheet, and Calculation of Profit by preparing Valuation Balance Sheet.
- IV. **General Insurance Company Final Accounts** (14 hours): Meaning of General Insurance, Differences between Life Insurance and General Insurance – Fire Insurance, Marine Insurance and Accident Insurance; and Preparation of Revenue Account, Profit and Loss Account and Balance Sheet (vertical format).
- V. **Social Responsibility Accounting** (6 hours): Meaning and Definition, Features and Objectives of Social Responsibility Accounting (theory only).

Skill Development Activities:

- (1) Collect and fill the share application form of a limited company
- (2) Collect Prospectus of a company and identify its salient features
- (3) Collect annual report of a company and list out its assets and liabilities
- (4) Collection of latest final accounts of a company and find out the intrinsic value of shares
- (5) Collect the annual reports of a company and calculate the value of goodwill under different methods

Recommended Books for Reference:

- (1) J Madegowda, Dr Giridhar, K V, and Inchara P M Gowda, Advanced Financial Accounting (Volume – IV), Himalaya Publishing House, Mumbai
- (2) Arulanandam and Raman, Corporate Accounting –II
- (3) Anil Kumar, Dr B. Mariyappa, Financial Accounting, HPH
- (4) Dr. S.N. Maheswari, Financial Accounting
- (5) Soundarajan. A and K. Venkataramana, Corporate Accounting, VBH
- (6) S. P. Jain and K. L. Narang, Corporate Accounting
- (7) S. Bhat Corporate Accounting.
- (8) S P Iyengar, Advanced Accountancy, Sultan Chand
- (9) R L Gupta, Advanced Accountancy.

(10) Shukla and Grewal, Financial Accounting

B.Com, Semester – IV

Course – 404: Management of Banking Operations

Course Objective: To acquaint students with the different banking operations

Pedagogy: combination of lectures, assignments and group discussions

Weekly Teaching Hours: 4 Maximum Marks: 100 Examination Duration: 3 hours

Unit Course Inputs

- I. **Banker and Customer** (16 hours): Introduction, Meaning and Definition of Banker and Customer, General and Special relationship between Banker and Customer, Special types of Customers – Minor, Joint Account, Partnership, Joint Stock Company, Trustee, Clubs and Associations.
- II. **Types of Accounts and Lending of Fund** (14 hours): Savings Bank Account, Current Account and Fixed Deposit Account – Features, Procedure for opening these Accounts; Lending of Funds – Different types of Loans, Overdrafts, Discounting of Bills, Cash Credit and Principles of Bank Lending.
- III. **Negotiable Instruments** (14 hours): Introduction, Meaning and Definition, Features, Kinds of Negotiable Instruments - Meaning, Definition and Features of Promissory Notes, Bills of Exchange and Cheques; Crossing of Cheques, Types of Crossing, Material Alteration, Endorsements - Meaning, Essentials and Kinds of Endorsement.
- IV. **Banking Operations** (12 hours): Collecting Banker – Meaning, Duties and Responsibilities of Collecting Banker, Holder for Value, Holder in Due Course, Statutory Protection to Collecting Banker; Paying Banker – Meaning, Precautions, Statutory protection to the Paying Banker, Dishonor of Cheques, Grounds for Dishonor, and Consequences of wrongful Dishonor of Cheques.
- V. **Banking** (8 hours): New Technology in Banking, e-Services, Debit and Credit Cards, Internet Banking, ATM, Electronic Fund Transfer, MICR, RTGS, NEFT, DEMAT. e-Banking, Core Banking and Mobile Banking.

Skill Development Activities:

- (1) Collect and fill account opening form of SB Account or Current Account
- (2) Collect and fill pay in slip of SB Account or Current Account
- (3) Draw specimen of Demand Draft
- (4) Draw different types of endorsement of cheques
- (5) Draw specimen of Travellers Cheques/Gift cheques/Credit cheques
- (6) List various customer services offered by atleast two banks of your choice

Recommended Books for Reference:

- (1) Gordon and Natarajan, Banking Theory Law and Practice, HPH
- (2) S. P Srivastava, Banking Theory and Practice, Anmol Publications
- (3) Tandan M.L, Banking Law and Practice in India, Indian Law House
- (4) Sheldon H.P, Practice and Law of Banking
- (5) K. Venkataramana, Banking Operations, SHBP
- (6) Kothari N. M, Law and Practice of Banking
- (7) Neelam C Gulati, Principles of Banking Management
- (8) Maheshwari. S.N, Banking Law and Practice, Vikas Publication
- (9) Shekar. K.C, Banking Theory Law and Practice, Vikas Publication
- (10) Dr. Alice Mani, Banking Law and Operation, SBH

B.Com, Semester – IV
Course – 405: Computer Applications in Business

Course Objective: To enable the students to learn the Accounting Package Tally and SQL Programs.

Pedagogy: combination of lectures, assignments, practical and group discussions

Weekly Teaching Hours: 4 Maximum Marks: 100 Examination Duration: 3 hours

Unit

Course Inputs

- I. **Introduction** (10 hours): Meaning and Definition, Characteristics of Computers, Types of Computers, Application of Computers in Business Operating System – Meaning and Functions of Operating System; Introduction to Windows OS, Computer Memory – Primary and Secondary, RAM and ROM.
- II. **Tally ERP 9.0** (14 hours): Introduction, Features, Advantages, Basic Rules - Real, Personal and Nominal Accounts, Assets and Liabilities, Debtors and Creditors, Menus in Tally, Company Creation, Company Info Menu, Creating Inventory of Products, Company Features (F11) and Configuration of Tally (F12), Gateway of Tally Menu, Master, Transaction, Import and Report.
- III. **Software Support for GST** (8 hours): Introduction, Features, Concept, Supporting Software, GST Working Principles in Tally, Power and Functions, GST Group Creation in Tally, GST adapting in Goods or Stock Creation Section, Creating CGST, SGST, IGST, Ledgers, and GST Entry System in Tally.
- IV. **Accounting Ledger and Vouchers** (12 hours): Predefined Accounting Groups, Primary Groups and Sub Groups, Steps for Creating - Alter and Delete Ledgers and Groups, Types of Ledgers, Types of Vouchers, Rules of Vouchers Entry, Balance Sheet, Profit and Loss Account, Trial Balance, Stock Summary, Computation of GST and TDS, and Exercises for making Voucher Entries.
- V. **Introduction to ORACLE** (14 hours): SQL Meaning, Concepts, Commands, Data Definition Commands, Data Manipulation Commands, SQL*Plus Editing Commands, Create Table, Insert Integrity Constraints, Primary Key, Secondary Key, Aggregate Functions, Select, Delete Form, and Update Order Commands.
- VI. **SQL *Plus Reports** (6 hours): Additional Operators: Like Between, in, Referential Integrity, on Delete Cascade, Join Operation - Inner Join, Outer Join, Alter Table, SQL Clauses - Where Clause, Order By, Group by Clause, Having Clause, Sub Queries, Introduction to PL/SQL, and Simple Programs.

Skill Development Activities:

- (1) Write steps for creating a new company in Tally
- (2) Solve the two exercise problems with GST
- (3) Simple Programs - Mathematical Calculation, Simple and Compound Interest, Area of Circle, Triangle, Biggest and Smallest number
- (4) Write down the student data base table in SQL Query
- (5) Steps for creating GST in Tally with example

Recommended Books for Reference:

- (1) Ashok K Nandani, Advanced Tally 9.0 ERP, 2017 Edition.
- (2) Niranjana Shrivastava, Computer Application In Management (Dreamtech Press)
- (3) P. Mohan, Computer Application Business (Himalaya Publication)
- (4) Sanjay Saxena, A First Course in Computers (Vikas Publishing House)
- (5) Ivan Bayross: Oracle – 7 (BPB Publications)

B.Com, Semester – IV
Course – 406: Business Regulations

Course Objective: To acquaint students with e different business laws and their interruptions

Pedagogy: Combination of lectures, assignments and group discussions

Weekly Teaching Hours: 3 Maximum Marks: 100 Examination Duration: 3 hours

Unit Course Inputs

- I. **Introduction to Business Laws** (8 hours): Introduction, Nature of Law, Meaning and Definition of Business Laws, Scope and Sources of Business Laws.
- II. **Contract Laws** (18 hours): Indian Contract Act, 1872 - Definition of Contract, Essentials of a Valid Contract, Classification of Contracts, Discharge of Contracts, Remedies for Breach of Contract; Indian Sale of Goods Act, 1930 - Definition of Contract of Sale, Essentials of Contract of Sale, Conditions and Warrantees, Rights and Duties of Buyer, and Rights of an Unpaid Seller.
- III. **Competition and Consumer Laws** (14 hours): The Competition Act, 2002 - Objectives of Competition Act, Features of Competition Act, CAT, Offences and Penalties under the Act, Competition Commission of India; Consumer Protection Act, 1986 - Definition of the Terms Consumer, Consumer Dispute, Defect, Deficiency, Unfair Trade Practices and Services; Rights of the Consumer under the Act, Consumer Redressal Agencies – District Forum, State Commission, and National Commission.
- IV. **Economic Laws** (12 hours): Indian Patent Laws and WTO Patent Rules - Meaning of IPR, Invention and Non-Invention, Procedure to get Patent, Restoration and Surrender of Lapsed Patent, Infringement of Patent; FEMA 1999 - Objects of FEMA, Salient Features of FEMA, Definition of Important Terms - Authorized Person, Currency, Foreign Currency, Foreign Exchange, Foreign Security, Offences and Penalties.
- V. **Environmental Law** (8 hours): Environment Protection Act, 1986 - Objects of the Act, Definitions of Important Terms - Environment, Environment Pollutant, Environment Pollution, Hazardous Substance and Occupier, Types of Pollution, and Rules and Powers of Central Government to Protect Environment in India.

Skill Development Activities:

- (1) Prepare a chart showing sources of business laws and Indian Constitution Articles having economic significance
- (2) Draft an agreement on behalf of a MNC to purchase raw materials indicating therein terms and conditions and all the essentials of a valid contract
- (3) Draft an application to the Chief Information Officer of any government office seeking information about government spending
- (4) Draft digital signature certificate
- (5) Draft a complaint to District Consumer Forum on the deficiency of service in a reputed corporate hospital for medical negligence
- (6) Collect leading cyber-crime cases and form groups in the class room and conduct group discussion
- (7) Draft a constructive and innovative suggestions note on global warming reduction

Recommended Books for Reference:

- (1) K. Aswathappa, Business Laws, HPH
- (2) Bulchandni, Business Laws, HPH
- (3) K. Venkataramana, Business Regulations, SHBP
- (4) Kamakshi P and Srikumari P, Business Regulations, VBH
- (5) N.D. Kapoor, Business Laws, Sultan Chand publications

- (6) S.S Gulshan, Business Law
- (7) S.C. Sharma, Business Law, I.K International Publishers
- (8) Tulsion Business Law, TMH

B.Com, Semester – IV
Course – 407: Indian Constitution

Course Objective: To acquaint students with essential knowledge about Indian Constitution

Pedagogy: Combination of lectures, assignments and group discussions

Weekly Teaching Hours: 4 Maximum Marks: 100 Examination Duration: 3 hours

Unit **Course Inputs**

- I. **Framing of the Constitution and Major Features** (14 hours): Constituent Assembly at Work, Preamble and Salient Features, Citizenship, Fundamental Rights, Directive Principles of State Policy, and Fundamental Duties.
- II. **Union and State Legislatures** (16 hours): Composition, Powers and Functions; Presiding Officers, Law Making Process, Committees of Parliament, Decline of Legislatures, and Reforms.
- III. **Union and State Executive** (16 hours): President and Vice-President – Elections, Powers and Functions; Prime Minister and Council of Ministers – Powers and Functions; Governor, Chief Minister and Council of Ministers – Powers and Functions; and Debate over Parliamentary and Presidential Forms of Government.
- IV. **Judiciary** (14 hours): Supreme Court and High Courts – Composition, Jurisdiction and Functions; and Judicial Activism.

Skill Development Activities:

- (1) List out the powers and functions of different levels of government
- (2) Understand the Union-State relations in India

Recommended Books for Reference:

- (1) D.D. Basu, Introduction to the Indian Constitution
- (2) A.S. Narang, Indian Constitution, Government and Politics
- (3) Nani Palkhivala, We, the People, UBS Publishers, New Delhi
- (4) A.G. Noorani, Indian Government and Politics
- (5) J.C. Johari, Indian Government and Politics Vol. I and II, Vishal, New Delhi
- (6) Gran Ville Austin, The Indian Constitution – Corner Stone of a Nation, Oxford, New Delhi
- (7) M.U. Pylee, Constitutional Government in India
- (8) K.K. Ghai, Indian Constitution

B.Com, Semester – V
Course – 501: Financial Management

Course Objective: To acquaint students with the principles of mobilizing and utilizing financial resources by the industrial enterprises

Pedagogy: Combination of lectures, assignments and group discussions

Weekly Teaching Hours: 4 Maximum Marks: 100 Examination Duration: 3 hours

Unit **Course Inputs**

- I. **Introduction to Financial Management** (10 hours): Introduction – Meaning of Finance, Business Finance, Finance Function, Aims of Finance Function; Organization Structure of Finance Department, Financial Management, Goals of Financial Management, Financial Decisions, Role of Financial Manager, Financial Planning - Steps in Financial Planning, Principles of sound Financial Planning, and Factors influencing sound Financial Plans.

- II. **Time Value of Money** (12 hours): Introduction – Meaning and Definition, Need, Future Value (Single Flow – Uneven Flow and Annuity), Present Value (Single Flow – Uneven Flow and Annuity), Doubling Period, Concept of Valuation - Valuation of Bonds, Debentures and Shares and Simple Problems.
- III. **Capital Structure** (12 hours): Introduction – Meaning of Capital Structure, Factors influencing Capital Structure, Optimum Capital Structure, Computation and Analysis of EBIT, EBT, EPS, Leverages and Simple Problems.
- IV. **Capital Budgeting** (16 hours): Introduction – Meaning and Definition of Capital Budgeting, Features, Significance, Process, Techniques - Payback Period, Accounting Rate of Return, Net Present Value, Internal Rate of Return and Profitability Index, and Simple Problems.
- V. **Dividend Policy** (8 hours): Introduction – Meaning and Definition, Determinants of Dividend Policy, Types of Dividends, Bonus Share, Dividend Theories - M.M Model, Walter's Model and Gordon's Model and Problems.
- VI. **Working Capital Management** (6 hours): Introduction, Concept of Working Capital, Significance of adequate Working Capital, Evils of excess or inadequate Working Capital, Determinants of Working Capital, Sources of Working Capital and Problems on determination of Working Capital.

Skill Development Activities:

- (1) Draw the organization chart of finance function of a company
- (2) Evaluate the NPV of an investment made in any one of the capital projects with imaginary figures for five years
- (3) Capital structure analysis of companies in different industries
- (4) Using imaginary figures, prepare an estimate of working capital requirements
- (5) Calculate dividend under MM Model with imaginary figures

Recommended Books for Reference:

- (1) Dr. B. Mariyappa, Financial Management, HPH
- (2) S N Maheshwari, Financial Management, Sultan Chand
- (3) Dr. Aswathanarayana T, Financial Management, VBH
- (4) K. Venkataramana, Financial Management, SHBP
- (5) Roy, Financial Management, HPH
- (6) Khan and Jain, Financial Management, TMH
- (7) S. Bhat, Financial Management
- (8) Sharma and Sashi Gupta, Financial Management, Kalyani Publication
- (9) I M Pandey, Financial Management. Vikas Publication
- (10) Prasanna Chandra, Financial Management, TMH
- (11) P.K Simha, Financial Management
- (12) M. Gangadhar Rao and Others, Financial management

B.Com, Semester – V
Course – 502: Income Tax – I

Course Objective: To acquaint students with the application with principles and provisions of IT Act 1961 relating to assessment

Pedagogy: Combination of lectures, assignments and group discussions.

Weekly Teaching Hours: 4 Maximum Marks: 100 Examination Duration: 3 hours

Unit

Course Inputs

- I. **Brief History of Indian Income Tax** (10 hours): Brief History of Income Tax, Definition, Assessment Year, Previous Year (including Exceptions), Assesse, Person,

- Income, Casual Income, Gross Total Income, Agricultural Income - Meaning and Classification of Capital and Revenue.
- II. **Exempted Income** (12 hours): Introduction, Exempted Incomes U/S 10 - restricted to Individual Assesse.
 - III. **Residential Status** (12 hours): Residential Status of an Individual, Determination of Residential Status, Incidence of Tax and Problems.
 - IV. **Income from Salary** (16 hours): Meaning, Definition, Basis of Charge, Advance Salary, Arrears of Salary, Allowances, Perquisites, Provident Fund, Profits in Lieu of Salary, Gratuity, Commutation of Pension, Encashment of Earned Leave, Compensation for Voluntary Retirement; Deductions from Salary U/S 16 and Problems on Income from Salary.
 - V. **Deduction** (8 hours): Under Sections 80C to 80U--80C, 80CCD, 80D, 80DD, 80E, 80G, 80GG, 80GGA, 80QQB, 80U and Problems on 80 C to 80 G only.
 - VI. **Income Tax Authorities** (6 hours): Income Tax Authorities - Powers and Functions of CBDT, CIT and A.O.

Skill Development Activities:

- (1) Form No. 49A (PAN) and 49B
- (2) Filling of Income Tax Returns
- (3) List of enclosures to be made along with IT returns (with reference to salary)
- (4) Preparation of Form 16
- (5) Computation of Income Tax and the Slab Rates
- (6) Computation of Gratuity

Recommended Books for Reference:

- (1) Dr. B. Mariyappa, Income Tax – I, HPH
- (2) Dr. Vinod K. Singhanian: Direct Taxes – Law and Practice, Taxman Publication
- (3) B.B. Lal: Direct Taxes, Konark Publisher (P) ltd.
- (4) Dr. Mehrotra and Dr. Goyal: Direct Taxes – Law and Practice, Sahitya Bhavan Publication
- (5) Dinakar Pagare: Law and Practice of Income Tax, Sultan Chand and Sons
- (6) Gaur and Narang, Income Tax
- (7) Dr. V. Rajesh Kumar and Dr. R. K. Sreekantha, Income Tax – I, Vittam Publications
- (8) 7 Lectures, Income Tax – I, VBH

B.Com, Semester – V

Course – 503: Business Statistics – I

Course Objective: To acquaint students with fundamental techniques and tools of business statistics

Pedagogy: Combination of lectures, assignments and group discussions

Weekly Teaching Hours: 4 Maximum Marks: 100 Examination Duration: 3 hours

Unit

Course Inputs

- I. **Introduction to Statistics** (10 hours): Meaning, Definitions, Functions, Scope and Limitations of Statistics and Distrust of Statistics.
- II. **Data and its Collection** (12 hours): Types of Data – Primary and Secondary Data – Methods for Collection of Primary Data – Sources of Secondary Data – Classification – Meaning and Types; Tabulation – Meaning, Rules for Construction of Tables, Parts of Statistical Table and Problems on Tabulation.
- III. **Diagrammatic and Graphic Representation of Statistical Data** (14 hours): Meaning, Types of Diagrams, Simple, Multiple, Subdivided and Percentage,

- Histogram – Location of Mode through Histogram and Frequency Polygon; and Ogive Curves – Location of Median and Quartiles through Ogive Curves.
- IV. **Measures of Central Tendency** (16 hours): Meaning and Definition, Types of Averages – Arithmetic Mean (Simple and Weighted), Median, Mode (excluding missing Frequency problems).
- V. **Measures of Dispersion** (6 hours): Meaning, Absolute and Relative Measures of Dispersion, Types of Dispersion – Range, Quartile Deviation, Standard Deviation, and Co-Efficient of each Method.
- VI. **Skewness** (6 hours): Meaning, Types of Skewness, Measures of Skewness, Absolute and Relative Measures of Skewness, Karl Pearson's Coefficient of Skewness and Bowley's Coefficient of Skewness.

Skill Development Activities:

- (1) Draw a blank table showing different attributes
- (2) Collect marks scored by 50 students in an examination and prepare a frequency distributions table
- (3) Collect data relating to prices of shares of two companies for ten days and ascertain which company's share prices is more stable
- (4) Collect the run scored by the two batsmen in ten one-day international cricket matches, find who is better run getter and who is more consistent
- (5) Select 10 items of daily-consumed products and collect base year quantity, base year price and current year price. Calculate Cost of Living Index

Recommended Books for Reference:

- (1) Anand Sharma, Statistics For Management, HPH
- (2) S P Gupta: Statistical Methods- Sultan Chand, Delhi
- (3) D.P Apte, Statistical Tools for Managers
- (4) Dr. B N Gupta, Statistics (Sahitya Bhavan), Agra
- (5) S.C Gupta: Business Statistics, HPH
- (6) N.V.R Naidu : Operation Research I.K. International Publishers
- (7) Ellahance: Statistical Methods, Kitab Mahal
- (8) Sanchethi and Kapoor: Business Mathematics, Sultan Chand
- (9) Veerachamy: Operation Research I.K. International Publishers
- (10) S. Jayashankar: Quantitative Techniques for Management
- (11) Chikoddi and Satya Prasad: Quantitative Analysis for Business Decision, HPH
- (12) Dr. Alice Mani: Quantitative Analysis for Business Decisions - I, SBH

B.Com, Semester – V

Course – 504: Cost Accounting

Course Objective: To acquaint students with elements of cost and also the reconciliation procedure

Pedagogy: Combination of lectures, assignments and group discussions

Weekly Teaching Hours: 4 Maximum Marks: 100 Examination Duration: 3 hours

Unit

Course Inputs

- I. **Introduction to Cost Accounting** (8 hours): Meaning and Definition of Cost, Costing, Cost Accounting and Cost Accountancy, Objectives, Scope, Advantages and Limitations of Cost Accounting, Differences between Financial Accounting and Cost Accounting, Methods and Techniques of Cost Accounting.
- II. **Elements of Cost** (12 hours): Cost Unit, Cost Centre, Classification of Costs, Problems on Cost Sheet (including Job and Batch Cost Sheet), Tenders and

Quotations.

- III. **Material Cost Control** (12 hours): Materials - Meaning and Types, Material Cost Control - Meaning and Objectives, Purchase of Materials – Centralized and Decentralized Purchasing, Purchase Procedure, Stores Control - Meaning and Techniques, Fixation of Stock Levels, EOQ, ABC Analysis, VED Analysis, Just in Time, Perpetual Inventory System, Bin Card, Stores Ledger, Pricing of Material Issues - FIFO, LIFO, Simple Average and Weighted Average Methods, and Problems thereon.
- IV. **Labour Cost Control** (12 hours): Labour - Meaning and Types; Cost Control, Time Keeping and Time Booking, Treatment of Idle Time and Over Time, Labour Turnover, Methods of Wage Payment - Time Rate, Piece Rate and Incentives Plans - Halsey Plan, Rowan Plan, Emerson's Efficiency Plan; Statement of Wage Sheet, and Problems thereon.
- V. **Overhead Cost Control** (12 hours): Meaning, Classification of Overheads, Allocation and Apportionment of Overheads, Primary Overhead Distribution Summary, Secondary Overhead Distribution Summary, Re-apportionment of Overheads - Direct Distribution, Step Ladder Method; Absorption of Overheads – Methods of Absorption - Problems on Allocation, Apportionment, Re-apportionment and Absorption of Overhead Expenses including Machine Hour Rate.
- VI. **Reconciliation of Cost and Financial Accounts** (8 hours): Meaning of Reconciliation, Need for Reconciliation, Reasons for differences in Profit or Loss shown by Cost Accounts and Financial Accounts, and Problems on Reconciliation Statement including Memorandum Reconciliation Account.

Skill Development Activities:

- (1) Identification of elements of cost in services sector by visiting any service provider/ providing unit
- (2) Cost estimation for making a proposed product
- (3) Draft the specimen of any two documents used in material account
- (4) Collection and classification of overheads in an organization on the basis of functions
- (5) Prepare a reconciliation statement with imaginary figures

Recommended Books for Reference:

- (1) J. Made Gowda, Cost Accounting, Himalaya Publishing House
- (2) M V Shukla – Cost and Management Accounting
- (3) N.K. Prasad: Cost Accounting, Books Syndicate Pvt. Ltd.
- (4) Nigam and Sharma: Cost Accounting, HPH
- (5) Khanna Pandey and Ahuja – Practical Costing, S Chand
- (6) Soundarajan A and K. Venkataramana, Cost Accounting, SHBP

B.Com, Semester – V

Course – 505: Advanced Accounts

Course Objective: To acquaint students with accounting for corporate restructuring

Pedagogy: Combination of lectures, assignments and group discussions

Weekly Teaching Hours: 4 Maximum Marks: 100 Examination Duration: 3 hours

Unit

Course Inputs

- I. **Mergers and Acquisitions** (22 hours): Meaning of Amalgamation and Acquisition, Types of Amalgamation – Amalgamation in the nature of Merger – Amalgamation in the nature of Purchase - Methods of Purchase Consideration – Calculation of Purchase Consideration (Ind AS 103) (Old AS14), Net Asset Method - Net Payment Method,

- Accounting for Amalgamation - Entries and Ledger Accounts in the Books of Transferor Company and Transferee Company and Preparation of New Balance Sheet (Vertical Format).
- II. **Internal Reconstruction** (10 hours): Meaning – Objective – Procedure – Form of Reduction – Passing of Journal Entries – Preparation of Reconstruction Accounts – Preparation of Balance Sheet after Reconstruction (Vertical Format) and Problems.
 - III. **Holding Company Accounts** (16 hours): Meaning of Holding Company and Subsidiary Companies – Concepts of Minority Interest – Majority Interest – Capital Profit – Revenue Profit – Cost of Control – Unrealized Profit included in Stock and Problems on Holding Company Accounts (excluding Cross and Chain Holding).
 - IV. **Investment Accounting** (12 hours): Introduction – Classification of Investment – Cost of Investment – Cum-Interest and Ex-Interest – Securities – Bonus Shares - Right Shares – Disposal of Investment – Valuation of Investments – Procedures of Recording Shares and Problems.
 - V. **Human Resources Accounting** (4 hours): Meaning, Objectives, Methods, Advantages and Limitations and problems thereon.

Skill Development Activities:

- (1) Calculation of purchase consideration with imaginary figures
- (2) List any five cases of amalgamation in the nature of merger or acquisition of Joint Stock Companies
- (3) List out legal Provisions in respect of internal reconstruction
- (4) Narrate the steps for preparation of consolidated balance sheet

Recommended Books for Reference:

- (1) Dr. B. Mariyappa – Advanced Corporate Accounting, HPH
- (2) Arulanandam and Raman; Corporate Accounting-II, HPH
- (3) Roadmap to IFRS and Indian Accounting Standards by CA Shibarama Tripathy
- (4) S.N. Maheswari , Financial Accounting, Vikas
- (5) Soundarajan A and K. Venkataramana, Advanced Corporate Accounting, SHBP
- (6) RL Gupta, Advanced Accountancy, Sultan Chand
- (7) K.K Verma – Corporate Accounting
- (8) Jain and Narang, Corporate Accounting
- (9) Tulsian, Advanced Accounting,
- (10) Shukla and Grewal – Advanced Accountancy, Sultan Chand

B.Com, Semester – V

Course – 506: Goods and Services Tax

Course Objective: To equip students with the principles and provisions of Goods and Services Tax (GST) - implemented from 2017 under the notion of One Nation, One Tax and One Market. And also to provide an insight into practical aspects and apply the provisions of GST laws to various situations.

Pedagogy: Combination of lectures, assignments and group discussions

Weekly Teaching Hours: 4 Maximum Marks: 100 Examination Duration: 3 hours

Unit

Course Inputs

- I. **Introduction to Goods and Services Tax (GST)** (8 hours): Introduction to GST, Meaning and Definition, Objectives and basic scheme of GST, Salient features of GST – Subsuming of taxes – Benefits of implementing GST – Constitutional amendments - Structure of GST (Dual Model) – Central GST – State/Union Territory GST – Integrated GST; GST Council - Structure, Powers and Functions, and

Provisions for amendments.

- II. **Goods and Services Act, 2017** (8 hours): CGST Act, SGST Act (Karnataka State), and IGST Act - Salient features of CGST Act, SGST Act (Karnataka State), IGST Act. Meaning and Definition: Aggregate turnover, Adjudicating authority, Agent, Business, Capital goods, Casual Taxable Person, Composite supply, Mixed supply, Exempt supply, Outward supply, Principal Supply, Place of Supply, Supplier, Goods, Input Service Distributor, Job work, Manufacture, Input tax, Input tax credit, Person, Place of business, Reverse charge, Works contract, Casual taxable person, Non-resident person; Export of goods or services, Import of goods or services, Intermediary, Location of supplier of service, Location of recipient of service and simple problems on Composite Supply and Mixed Supply
- III. **Procedure and Levy under GST** (32 hours): Registration under GST, Procedure for registration, Persons liable for registration, Persons not liable for registration, Compulsory registration, Deemed registration, Special provisions for Casual taxable persons and Non-resident taxable persons; Exempted goods and services, Rates of GST.
 Procedure relating to Levy (CGST and SGST): Scope of supply, Tax liability on Mixed and supply, Time of supply of goods and services Value of taxable supply, Computation of taxable value and tax liability on Goods and Services.
 Procedure relating to Levy: (IGST): Inter-state supply, intra-state supply, Zero rates supply, Value of taxable supply – Computation of taxable value and tax liability; Input tax Credit - Eligibility, Apportionment, Inputs on capital goods, Distribution of credit by Input Service Distributor (ISD) – Transfer of Input tax credit and simple problems on utilization of input tax credit.
- IV. **Assessment and Returns** (10 hours): Meaning, types of assessment - First return, Claim of input tax credit, Matching reversal and reclaim of input tax credit, Annual return and Final return and Problems on Assessment of tax and tax liability.
- V. **GST and Technology** (6 hours): GST Network: Structure, Vision and Mission, Powers and Functions; Goods and Service Tax Suvidha Providers (GSP): Concept, Framework and Guidelines and architecture to integrate with GST system; and GSP Eco System. (theory only).

Skill Development Activities:

- (1) Collect GST Returns form and fill with imaginary figures
 GSTR-3B (Monthly Returns)
 GSTR-1 (Details of Outward supplies of Goods or Services)
 GSTR-2 (Inward Supplies received by tax payer)
- (2) Visit your locality shops and collect information relating to tax rate applicable to them
- (3) Collect information about different tax rates for goods and services and write five examples for each tax rate
- (4) Visit Bank and Insurance Company, collect information relating to GST applicable to them for different services
- (5) Collect information relating to RCM (Reverse Charge Mechanism) for different expenditures

Recommended Books for Reference:

- (1) GST Act 2017, Karnataka Law and Journal Publications
- (2) GST, Taxman Publications
- (3) Introduction to GST, Department of GST New Delhi
- (4) Introduction to GST, Dr B G Bhaskar

- (5) Introduction to GST, Dr M Mariyappa

B.Com, Semester – V

Course – 508: Logical and Analytical Reasoning

Course Objective: To acquaint students with reasoning and analytical ability

Pedagogy: Combination of lectures, assignments and group discussions

Weekly Teaching Hours: 2 Maximum Marks: 50 Examination Duration: 1½ hours

Unit Course Inputs

- I. **Logical Reasoning** (6 hours): Venn Diagram, Logical Sufficiency and Seating Arrangement.
- II. **Intellectual Reasoning** (7 hours): Blood Relations, D Calendar, Series, Coding and Decoding.
- III. **Verbal and Non-verbal Reasoning** (4 hours): Verbal Alphabetical Analogy, Puzzles and Abstract Reasoning.
- IV. **Analytical Reasoning** (5 hours): Cause and Effective Conclusions, Statement and Arguments and Statement and Assumptions.
- V. **Mathematical Reasoning** (6 hours): Problems related to Wages, Speed – Distance, Percentage and Average, Ratio and Proportion.
- VI. **Data Interpretation** (4 hours): Problems on Tables and Graph.

Skill Development Activities:

- (1) Draw Venn Diagram with imaginary Figures
- (2) Draw Coding and Decoding programs with imaginary figures
- (3) Calculate speed of a train with imaginary figures
- (4) Draw Tables and Chart with Imaginary figures

Recommended Books for Reference:

- (1) Agarwal, Quantitative Reasoning.
- (2) Dr. Giridhar K.V. Logical and Analytical Reasoning, 5th Edition, College Book House
- (3) M. N. Tyra, Speed Mathematics

B.Com, Semester – VI

Course – 601: International Financial Reporting Standards

Course Objective: To acquaint students with recent accounting standards

Pedagogy: Combination of lectures, assignments and group discussions

Weekly Teaching Hours: 4 Maximum Marks: 100 Examination Duration: 3 hours

Unit Course Inputs

- I. **Introduction to IFRS** (8 hours): Meaning and Scope of IFRS, Need for IFRS, GAAP Vs IAS, IAS Vs IFRS, Nature and Operations of IASB and IFRIC, Status and use of IFRS around the World.
- II. **Profit Presentation** (8 hours): Presentation of Financial Statements (IAS - 1) Revenue (IAS - 18) and Accounting Policies, Changes in Accounting Estimates and Errors (IAS - 8)
- III. **Group Accounting** (12 hours): Consolidated Financial Statements and Accounting for Investment in Subsidiaries (IAS - 27), Accounting for Investments in Associates (IAS - 28), Joint Ventures (IAS - 31), and Business Combinations (IFRS - 3)
- IV. **Disclosure** (14 hours): Related Party Disclosures (IAS - 24), Earning per Share (IAS - 33) and Interim Financial Reporting (IAS - 34), and First Time Adoption of IFRS (IFRS - 1)
- V. **Asset Recognition and Measurement** (14 hours): Property, Plant and Equipment

(IAS - 16), Intangible Assets (IAS - 38), Investment Property (IAS - 40), Inventories (IAS - 2), and Leases (IAS - 17).

- VI. **Accounting for Liabilities** (8 hours): Share Based Payment (IFRS - 2), Provisions, Contingent Assets and Contingent Liabilities (IAS - 37), and Events after the Reporting Period (IAS - 10).

Skill Development Activities:

- (1) Prepare a note on convergence of Indian Accounting Standards with IFRS
- (2) Analysis of published financial statements for at-least two types of stakeholders
- (3) Comment on recent developments/exposure draft in IFRS
- (4) Preparation of notes to accounts for non-current assets
- (5) Assignment on social reporting
- (6) Preparation of Consolidated Financial Statement of any two existing companies
- (7) Disclosure of change in equity in the annual reports of any two select companies

Recommended Books for Reference:

- (1) IFRSs, Taxman Publications (Blue book)
- (2) IFRS, Barry Larking, Taxman Publications
- (3) IFRS, T.P. Ghosh, Taxman Publications
- (4) IFRS and Ind AS, Kamal Garg, Bharat publishers
- (5) International Accounting, Mohapatra A.K. Das

B.Com, Semester - VI
Course – 602: Income Tax – II

Course Objective: To acquaint students about the computation of different sources of income

Pedagogy: Combination of lectures, assignments and group discussions

Weekly Teaching Hours: 4 Maximum Marks: 100 Examination Duration: 3 hours

Unit

Course Inputs

- I. **Income from House Property** (14 hours): Basis of Charge – Deemed Owners – Exempted Incomes from House Property – Annual Value – Determination of Annual Value – Treatment of Unrealized Rent – Loss Due to Vacancy – Deductions from Annual Value and Problems on Income from House Property.
- II. **Profits and Gains of Business and Profession** (Individual Assesse) (16 hours): Meaning and Definition of Business, Profession – Vocation - Expenses expressly Allowed – Allowable Losses – Expenses expressly Disallowed – Expenses Allowed on Payment Basis - Problems on Business relating to Sole Trader and Problems on Profession relating to Chartered Accountant, Advocate and Medical Practitioner.
- III. **Capital Gains** (12 hours): Basis of Charge – Capital Assets – Transfer of Capital Assets – Computation of Capital Gains –Exemptions U/S 54, 54B, 54D, 54EC, 54F and Problems on Capital Gains.
- IV. **Income from other Sources** (10 hours): Incomes – Taxable under the head ‘Other Sources’ – Securities – Kinds of Securities – Rules for Grossing Up – Ex-Interest Securities – Cum-Interest Securities – Bond Washing Transactions and Problems on Income from Other Sources.
- V. **Set-off and Carry Forward of Losses, Computation of Total Income and Tax Liability** (8 hours): Meaning – Provision for Set-off and Carry Forward of Losses (theory only); Computation of Total Income and Tax Liability of an Individual Assessee (excluding Salary Income).
- VI. **Filing of Returns and Assessment Procedure** (4 hours): PAN, TAN, E-Filing and IT Challan.

Skill Development Activities:

- (1) Table of rates of Tax deducted at source
- (2) Filing of IT returns of individuals
- (3) List of enclosures for IT returns
- (4) Due date for filing of returns
- (5) Income tax proposal as per the recent union budget

Recommended Books for Reference:

- (1) Dr. B. Mariyappa, Income Tax- II, HPH
- (2) Dr. Vinod K. Singhanian: Direct Taxes – Law and Practice, Taxman publication
- (3) B.B. Lal: Direct Taxes, Konark Publisher (P) ltd
- (4) Dr. Mehrotra and Dr. Goyal: Direct Taxes – Law and Practice, Sahitya Bhavan Publication
- (5) Dinakar Pagare: Law and Practice of Income Tax, Sultan Chand and sons
- (6) Gaur and Narang: Income Tax
- (7) Lectures on Income Tax – I, VBH
- (8) Dr. V. Rajesh Kumar and Dr. R. K. Sreekantha: Income Tax – I, Vittam Publications.

B.Com, Semester – VI**Course – 603: Business Statistics – II**

Course Objective: To acquaint students about practical application of statistical tools

Pedagogy: Combination of lectures, assignments and group discussions

Weekly Teaching Hours: 4 Maximum Marks: 100 Examination Duration: 3 hours

Unit

Course Inputs

- I. **Correlation Analysis** (14 hours): Meaning – Methods of Studying Correlation, Karl Pearson's Co-efficient of Correlation (Simple Correlation and Table Correlation) and Probable Error.
- II. **Regression Analysis** (18 hours): Meaning - Correlation Vs Regression, Determination of Regression Co-efficient, Framing Regression Equations, Simple Regression and Regression for Grouped Data.
- III. **Index Numbers** (12 hours): Meaning and Definition – Uses – Classification – Construction of Index Numbers – Methods of constructing Index Numbers – Simple Aggregative Method – Simple Average of Price Relative Method – Weighted Index Method – Fisher's Ideal Method (including TRT and FRT) – Consumer Price Index and Problems.
- IV. **Interpolation and Extrapolation** (12 hours): Meaning – Utility – Algebraic Methods – Binomial and Newton's Methods only.
- V. **Association of Attributes** (4 hours): Meaning – Correlation Vs Association of Attributes, Methods of Studying Association – Yule's Method only
- VI. **Statistical Quality Control** (4 hours): Meaning – Objectives – Control Charts and their Uses, Types of Control Charts, Construction Charts, Construction of Mean and Range Charts only.

Skill Development Activities:

- (1) Collect age statistics of 10 newly married couples and compute correlation coefficient
- (2) Collect age statistics of 10 newly married couples and compute regression equations; estimate the age of bride when age of bridegroom is given
- (3) Select 10 items of daily consumed products and collect base year quantity, base year price and current year price. Calculate Cost of Living Index
- (4) Collect the sales or production statistics of a company for five years and extrapolate

the production or sales for the 6th year

- (5) Draw a mean chart of any company to ascertain the quality of the product

Recommended Books for Reference:

- (1) Anand Sharma : Statistics for Management, HPH
- (2) S P Gupta: Statistical Methods- Sultan Chand, Delhi
- (3) D.P Apte, Statistical Tools for Managers
- (4) Dr. B N Gupta: Statistics, Sahitya Bhavan, Agra.
- (5) S.C Gupta: Business Statistics, HPH
- (6) N.V.R Naidu: Operation Research I.K. International Publishers
- (7) Ellahance: Statistical Methods, Kitab Mahal
- (8) Sanchethi and Kapoor: Business Mathematics, Sultan Chand
- (9) Veerachamy: Operation Research I.K. International Publishers
- (10) S. Jayashankar: Quantitative Techniques for Management
- (11) Chikoddi and Satya Prasad: Quantitative Analysis for Business Decision, HPH
- (12) Dr. Alice Mani: Quantitative Analysis for Business Decisions - I, SBH

B.Com, Semester - VI

Course – 604: Cost Accounting - Methods and Techniques

Course Objective: To acquaint students about methods and techniques of cost accounting

Pedagogy: Combination of lectures, assignments and group discussions

Weekly Teaching Hours: 4 Maximum Marks: 100 Examination Duration: 3 hours

Unit

Course Inputs

- I. **Contract Costing** (10 hours): Meaning, Nature and Types of Contract, Difference between Contract Costing and Job Costing, Concepts of Escalation Clause, Retention Money, Profit on Incomplete Contracts and Problems.
- II. **Process Costing** (12 hours): Meaning, Nature and Applicability, By-Products and Joint Products and Problems on Process Costing including Joint Products and By-Products.
- III. **Operating Costing** (10 hours): Meaning and Applicability of Operating Costing, Operating Cost and its Classification, Problems on Preparation of Operating Cost Sheet (only Transport Undertakings).
- IV. **Marginal Costing** (14 hours): Meaning, Basic Concepts, Assumptions, Marginal Cost Statements, Contribution, BE Analysis, P/V Ratio, BEP, Margin Of Safety and Problems.
- V. **Standard Costing** (10 hours): Meaning, Definitions, Differences between Standard Costing and Budgetary Control, Analysis of Variances, Problems on Material Cost Variance - Material Price Variance, Material Usage Variance; Labour Cost Variance, Labour Rate Variance, and Labour Efficiency Variance.
- VI. **Activity Based Costing and Learning Curve Theory** (8 hours): Concept of Activity Based Costing, Cost Drivers and Cost Pools, Allocation of Overheads under ABC – Characteristics, Implementation and Benefits of ABC; Concept and Phases of Learning Curve, Graphical Representation, Learning Curve Applications and Factors affecting Learning Curve (theory only)

Skill Development Activities:

- (1) Listing of industries located in your area and methods of costing adopted by them
- (2) List out materials used in any two organizations
- (3) Preparation with imaginary figures composite job cost statement
- (4) Preparation of activity based cost statement

- (5) Prepare a chart showing the apportionment of overheads under ABC

Recommended Books for Reference:

- (1) J. Madegowda, Cost Accounting, Himalaya Publishing House
- (2) J. Madegowda, Marginal Costing for Managerial Decisions, Prateeksha Publications
- (3) J. Madegowda, Cost Management, Himalaya Publishing House
- (4) S P Iyengar, Cost Accounting
- (5) Nigam and Sharma, Advanced Costing
- (6) B.S. Raman, Cost Accounting
- (7) Dr. B. Mariyappa, Cost Accounting Methods - HPH
- (8) M.N. Arora, Cost Accounting
- (9) Ashish K Bhattacharyya: cost accounting for business managers
- (10) N. Prasad, Costing
- (11) Palaniappan and Hariharan: Cost Accounting, I.K. International Publishers
- (12) Jain and Narang, Cost Accounting
- (13) Ravi M. Kishore – Cost Management
- (14) Charles T Horngren, George Foster, Srikant M. Data, Cost Accounting: A Managerial Emphasis
- (15) Rathnam: Cost Accounting

B.Com, Semester - VI

Course – 605: Management Accounting

Course Objective: To acquaint students with necessary knowledge of practical aspects of Management Accounting

Pedagogy: Combination of lectures, assignments and group discussions

Weekly Teaching Hours: 5 Maximum Marks: 100 Examination Duration: 3 hours

Unit

Course Inputs

- I. **Management Accounting** (10 hours): Meaning and Definition of Management Accounting, Scope and Objectives of Management Accounting – Differences between Management Accounting and Financial Accounting – Management Accounting and Cost Accounting and Limitations of Management Accounting.
- II. **Analysis of Financial Statements** (10 hours): Meaning and Definition of Financial Statements – Financial Analysis – Types of Financial Analysis, Techniques of Financial Analysis - Common Size Statements, Comparative Statements and Trend Analysis and Problems.
- III. **Ratio Analysis** (14 hours): Meaning and Objectives – Types of Ratios – Re-arrangement of Income Statements and Balance Sheet – (A) Profitability Ratios – GP Ratio, NP Ratio, Operating Ratio – Operating Profit Ratio - Return on Capital Employed Ratio – EPS; (B) Turnover Ratios – Debtors Turnover Ratio – Creditors Turnover Ratio; (C) Financial Ratios, Current Ratio - Liquidity Ratio, Debt-Equity Ratio, Capital Generating Ratio and Advantages and Limitations of Ratios.
- IV. **Fund Flow Analysis** (10 hours): Meaning, Concepts of Funds – Meaning and Definition of Fund Flow Statements – Uses and Limitations – Procedure for Preparation of Funds Flow Statement – Statement of Changes in Working Capital, Statement of Funds from Operations, and Statements of Sources and Application of Funds.
- V. **Cash Flow Statements** (10 hours): Meaning, Definition, Uses and Limitations- Differences between Fund Flow Statement and Cash Flow Statement – Preparation of Cash Flow Statements (Ind AS - 7): Direct Method and Indirect Method.

VI. **Budgetary Control** (10 hours): Meaning of Budget, Budgeting and Budgetary Control, Types of Budgets, Limitations of Budgetary Control, Problems on Sales Budget and Flexible Budget.

Skill Development Activities:

- (1) Preparation of common size financial statements, trend percentages and comparative financial statements of an organization at least for two years
- (2) Calculation of ratios based on the above financial statements – gross profit ratio, net profit ratio, operation profit ratio, current ratio and operations
- (3) Identify current assets, current liabilities, and non-current liabilities from the above financial statements
- (4) Preparation of fund flow statement and determination fund from operations with imaginary figures
- (5) Preparation of flexible budget with imaginary figures
- (6) Visit an organization, collect information regarding budgets prepared by them, and prepare budget based on the given information

Recommended Books for Reference:

- (1) Advanced Management Accounting: J. Madegowda, 2nded, Himalaya Publishing House
- (2) Management Accounting: J. Madegowda, Himalaya Publishing House
- (3) Management Accounting: Dr. S.P. Gupta
- (4) Management Accounting :M.Y. Khan And P.K. Jain
- (5) Management Accounting: Dr. S.N. Maheshwari
- (6) Management Accounting: B.S. Raman
- (7) Management Accounting; Howard And Brown
- (8) Management Accounting : S.M. Goyal And Dr. Manmohan
- (9) Management Accounting-Dr, B. Mariyappa

B.Com, Semester – VI

Course – 606: Principles and Practice of Auditing

Course Objective: To acquaint students with auditing principles and different dimensions of Auditing

Pedagogy: Combination of lectures, assignments and group discussions

Weekly Teaching Hours: 3 Maximum Marks: 100 Examination Duration: 3 hours

Unit

Course Inputs

- I. **Introduction to Auditing** (12 hours): Meaning, Definition, Objectives, Types of Audit, Advantages and Disadvantages of Audit, Preparation before Commencement of New Audit, Audit Note, Audit Working Paper, Audit Programme, Recent Trends in Auditing, Nature and Significance of Tax Audit, Cost Audit and Management Audit.
- II. **Internal Check** (10 hours): Meaning, Objectives, Fundamental Principles, Internal Check as Regards Wage Payment, Cash Book, Purchases, Cash Sales; Merits of Internal Check, Differences between Internal Check and Internal Audit.
- III. **Vouching** (14 hours): Definition, Importance, Objectives, Routine Checking and Vouching - Types of Vouchers, Vouching Receipts, Cash Sales, Receipts from Debtors, Proceeds of Sales, Sale of Investment, Vouching of Payments, Cash Purchase and Payment to Creditors.
- IV. **Verification and Valuation of Assets and Liabilities** (14 hours): Meaning and Objectives of Verification and Valuation - Position of an Auditor as regards the Valuation of Assets - Verification and Valuation of different Items - Land and

Building, Plant and Machinery, Goodwill – Investments - Stock in Trade, Bills Payable and Sundry Creditors.

- V. **Company Audit and Others** (10 hours): Company Auditor – Appointment – Qualifications - Powers – Duties and Liabilities; Types of Audit Report - Clean and Qualified Report, Audit of Educational Institutions, Audit of Insurance Company and Audit of Cooperative Societies.
- VI. **Audit Standards** (4 hours): Audit of Computerized Accounts - Audits in an EDP - General EDP Controls, EDP Application Controls and Computer Assist Auditing Techniques

Skill Development Activities:

- (1) Draft an audit programme
- (2) Draft an investigation report on behalf of a public limited company
- (3) Visit an audit firm, write about the procedure followed by them in auditing the books of account of a firm
- (4) Formulate internal check system for cash sales
- (5) Prepare qualified/clean audit report

Recommended Books for Reference:

- (1) Auditing - T.R Sharma
- (2) Principles of Auditing - Dr. Nanjgowda
- (3) Principles and Practice of Auditing - M.S Ramaswamy
- (4) Principles and Practice of Auditing –R.G Sexena
- (5) Auditing – B.S Raman
- (6) Practical auditing – B.N Tandon
- (7) Auditing – Kamal Gupta

B.Com, Semester - VI

Course – 608: Soft Skills

Course Objective: To acquaint students with the essential of communication

Pedagogy: Combination of lectures, assignments and group discussions

Weekly Teaching Hours: 2 Maximum Marks: 50 Examination Duration: 1½ hours

Unit

Course Inputs

- I. **Elements of Communication** (4 hours): Meaning, Importance, Objectives and Principles of Communication, Types and Forms of Communication, Process, Impediments of Effective Communication, and Strategies for Effective Communication.
- II. **Non-verbal Communication**(8 hours): Body Language, Gestures, Postures, Facial Expressions, Dress Codes, Cross Cultural Dimensions of Business Communication, Listening and Speaking, Techniques of Eliciting Response, Probing Questions, Observation, Business and Social Etiquettes.
- III. **Public Speaking** (8 hours): Principles of Effective Speech and Presentations, Technical Speeches and Non-Technical Presentations, Speech of Introduction of a Speaker - Speech of Vote of Thanks - Occasional Speech - Theme Speech; Moderating Programs and Use of Technology
- IV. **Interview Techniques** (6 hours): Importance of Interviews, Art of Conducting and Giving Interviews, Placement Interviews - Discipline Interviews - Appraisal Interviews and Exit Interviews.
- V. **Meetings** (6 Hours): Importance, Meetings Opening and Closing Meetings Participating and Conducting Group Discussions, Brain Storming, and E- Meetings,

Career Counseling, and Resume Preparation.

Skill Development Activities:

- (1) Conduct a mock meeting and draft minutes of the meeting
- (2) Draft a letter of enquiry to purchase a laptop
- (3) Draft your bio-data

Recommended Books for Reference:

- (1) Soft Skills of Personality Development: C.G.G Krishnamacharyulu and Lalitha
- (2) Lesikar, R.V. and Flatley, M.E. Basic Business Communication Skills for Empowering the Internet Generation, TMH, New Delhi.
- (3) Rai and Rai: Business Communication Himalaya Publishing House
- (4) Ludlow, R. and Panton, F. (1998). The Essence of Effective Communications, Prentice Hall of India Pvt. Ltd
- (5) M.S. Rao : Soft Skills – Enhancing Employability I.K. International
- (6) Rao and Das: Communication Skills
- (7) Adair, J. (2003). Effective Communication. Pan McMillan.
- (8) Thill, J.V. and Bovee, G. L, Excellence in Business Communication, TMH, New York.
- (9) Bowman, J.P. and Branchaw, P.P, Business Communications: From Process to Product. Dryden Press, Chicago.
- (10) Sharma S.P and Others, Business Communication
- (11) Rajkumar, Basic of Business Communication
- (12) Banerjee: Soft Skills Business and Professional Communication, I.K. International

Specialization Stream – A: Finance Stream

B.Com, Semester – V

Course – 507A: Advanced Financial Management

Course Objective: To acquaint students with the ways of mobilizing and using of financial resources by industrial enterprises

Pedagogy: Combination of lectures, assignments and group discussions.

Weekly Teaching Hours:4 Maximum Marks: 100 Examination Duration: 3 hours

Unit **Course Inputs**

- I. **Investment Decisions and Risk Analysis** (14 hours): Risk Analysis – Types of Risks – Risk and Uncertainty – Techniques of Measuring Risks – Risk Adjusted Discount Rate Approach – Certainty Equivalent Approach – Sensitivity Analysis - Probability Approach - Standard Deviation and Co-efficient of Variation – Decision Tree Analysis and Problems,
- II. **Sources of Capital** (12 hours): Long Term Sources – Meaning – Equity Shares – Preference Shares – Debentures – Differences between Shares and Debentures – Retained Earnings – Long Term Loans and Loans From Financial Institutions.
- III. **Capital Structure Theories** (10 hours): Introduction – Capital Structure – Capital Structure Theories - Net Income Approach - Net Operating Income Approach - Traditional Approach – MM Approach and Problems.
- IV. **Dividend Theories** (12 hours): Introduction – Irrelevance Theory – MM Model; Relevance Theories - Walter Model - Gordon Model and Problems on Dividend Theories.
- V. **Planning and Forecasting of Working Capital** (14 hours): Concept of Working Capital – Determinants of Working Capital – Estimating Working Capital Needs – Operating Cycle – Cash Management – Motives of Holding Cash – Cash Management

Techniques – Preparation of Cash Budget, Receivables Management – Preparation of Ageing Schedule and Debtors Turnover Ratio; Inventory Management Techniques and Problems on EOQ.

Skill Development Activities:

- (1) Preparation of a small project report of a small business concern covering all components - Finance, Marketing, Production, Human Resources, General administration (any one component can be selected as the title of the report)
- (2) Designing a capital structure for a trading concern
- (3) Preparing a blue print on working capital of a small concern
- (4) Prepare a chart on modes of cash budget
- (5) List out different modes of Dividend Policy
- (6) List out the companies which have declared dividends recently along with the rate of dividend

Recommended Books for Reference:

- (1) Narendra Singh, Advanced Financial Management
- (2) K. Venkataramana, Advanced Financial Management, SHBP.
- (3) Ghousia Khatoon, Mahanada B. C., Advanced Financial Management, VBH
- (4) S N Maheshwari, Financial Management Principles and Practice, Sultan Chand
- (5) Khan and Jain, Financial Management, Tata McGraw Hill
- (6) Sudhindra Bhat, Financial Management, Prentice Hall of India
- (7) Sharma and Sashi Gupta, Financial Management, Kalyani Publication
- (8) I M Pandey, Financial Management, Vikas Publication
- (9) Prasanna Chandra, Financial Management, Tata McGraw Hill
- (10) R.M Srivastava, Financial Management & Policy, Sterling publishers

Specialization Stream – A: Finance Stream

B.Com, Semester - VI

Course – 607A: Security Analysis and Portfolio Management

Course Objective: To acquaint students with investment decisions and portfolio management

Pedagogy: Combination of lectures, assignments and group discussions

Weekly Teaching Hours: 4 Maximum Marks: 100 Examination Duration: 3 hours

Unit

Course Inputs

- I. **Introduction to Investment Management** (15 hours): Meaning of Investment – Selection of Investment – Classification of Securities – Risk and Uncertainty – Types of Risks – Risk and Expected Return – Measurement of Portfolio Risk – Benefits of Diversification – Investment Strategies – Types of Companies and Stocks – Matrix Approach in Investment Decision and Investment Avenues
- II. **Security Analysis** (15 hours): Introduction – Fundamental Analysis – Economic Analysis – Industry Analysis – Company Analysis; Technical Analysis – Dow Theory – Advanced Declined Theory and Chartism Assumptions of Technical Analysis.
- III. **Modern Portfolio Theory** (14 hours): Introduction – Mean – Variance Model – Capital Market Line – Market Portfolio – Capital Asset Pricing Model – Security Market Line – Beta Factor – Alpha and Beta Coefficient and Arbitrage Pricing Model.
- IV. **Portfolio Management** (10 hours): Markowitz Model – Sharpe Model – Jensen and Treynor Model.
- V. **Global Markets** (10 hours): Global Investment Benefits - Introduction to ADRs, GDRs, FCCBs, Foreign Bonds, Global Mutual Funds – Relationship between Trends

in Global Markets and Domestic Markets.

Skill Development Activities:

- (1) Prepare an imaginary investment portfolio for salaried man whose income is ₹ 10 lakhs per annum and estimate savings is ₹ 2 lakhs per annum
- (2) Make a list of 30 companies which have gone for IPO very recently
- (3) Prepare a statement showing the ups and downs in the BSE index for the last one year

Recommended Books for Reference:

- (1) Avadhani, Investment Analysis and Portfolio Management, HPH
- (2) Preeti Singh - Security Analysis and Portfolio Management, HPH
- (3) K. Venkataramana, Security Analysis and Portfolio Management, SBHP
- (4) Kevin, Investment and Portfolio Management
- (5) Prasanna Chandra, Investment Analysis and Portfolio Management, McGraw-Hill
- (6) Sudhindra Bhat, Security Analysis and Portfolio Management - Fischer and Jordan, Security Analysis and Portfolio Management, Prentice Hall
- (7) A.P. Dash, Security Analysis and Portfolio Management, I.K. Intl
- (8) Rohini Singh, Security Analysis and Portfolio Management
- (9) Punithvathy Pandian, Security analysis & portfolio Management

Specialization Stream – B: Marketing Stream

B.Com, Semester – V

Course – 507B: Product and Sales Management

Course Objective: To acquaint students with adequate knowledge of product and sales management

Pedagogy: Combination of lectures, assignments and group discussions.

Weekly Teaching Hours: 4 Maximum Marks: 100 Examination Duration: 3 hours

Unit

Course Inputs

- I. **Introduction to Product Management** (12 hours): Meaning, Definition of Product, Market - Market focused Organization; Functionally focused Organization; Product Management – Facts Vs Fiction; Changes affecting Product Management; and Product Strategy.
- II. **Product Planning and Management** (12 hours): Meaning, Definition and Objectives of Product Planning; Frequent mistakes in Planning; Planning Process; Components of a good Plan; Product Life Cycle; Market Growth; Product Attractiveness - Factors influencing a Product; Threat of New Entrants, Product Differentiation; Bargaining Power of Buyers and Suppliers; Pressure from Substitutes; Environment Analysis; and Product Line Management.
- III. **New Product Development** (12 hours): Meaning, Definition and Organization for New Product Development; Idea Generation and Screening; Concept of Development and Evaluation; New Product Development and Evaluation; Product Modification; Product Variants; Brand Extension; Test Marketing, Evaluation for Market Acceptance; Commercialization and Product Failure.
- IV. **Salesman** (14 hours): Meaning, Definition and Qualities of a good Salesman, Recruitment of Salesmen in the Organization, Product, Knowledge, Planned Selling, Approach - Pre-Approach-Meeting, Objectives, Closing the Sale-Scales Call; Customer Psychology - Buying Motives of our Customer, Effective Speaking, Consumer Products Vs Industrial Products Selling - Trade Relations – Sales Personnel Recruitment, Selection, Training, and Remuneration.

- V. **Sales and Marketing System** (14 hours): Meaning, Definition, Objectives of Sales, Promotion Schemes and Situations in which they Launched. 42 Direct Premiums (Branded Packs, Price Rebates, Quantity Deals, Sampling, *etc*), Criteria for Judging the Success or Failure of Sales Promotion Schemes, What Sales Promotion can achieve and its Limitations; Consumer Contests, Interim Action Premiums (Coupon, Offers, *etc*), Self-Liquidating Premium; Survey of Gift Scheme Window Display, Types of Dealer Promotion Schemes, Wholesale and Retail Trade (Discount and Bonus Incentives for the Trade Sales Promotion and Industrial Products - Merchandising and Display - Sales Aids and Dealers Aids. Marketing System - Marketing Channels Behavioral Process in Marketing Channels, Designing Channels, Channels of Distribution and Promotion, Physical Distribution; and Factors affecting Channel Choice.

Skill Development Activities:

- (1) Select any product and examine the features of channels selected for distribution
- (2) Visit any organization and understand about remuneration and incentives to salesman
- (3) Chart out product planning process
- (4) Chart Sales Promotion schemes of two consumer durable products and two non-consumer durable products
- (5) Identify a product and position it in the market – chart it out

Recommended Books for Reference:

- (1) Lehmann R. Donald & Winer. S. Russell; Product Management; Tata McGraw-Hill Edition; 3rd Edition
- (2) Still R. Richard, Cundiff W. Edward and Govoni A P Norman, Sales Management Decisions, Strategies and Cases; Prentice Hall of India (P) Ltd; New Delhi
- (3) Ramanujam and Majumdar, Product management
- (4) Chunawalla S.A, Product management.
- (5) Aswathappa, Product management
- (6) Verma and Agarwal, Sales management

Specialization Stream – B: Marketing Stream

B.Com, Semester – VI

Course – 607B: Retail Management

Course Objective: To acquaint students about the consumer behavior in retail management

Pedagogy: Combination of lectures, assignments and group discussions.

Weekly Teaching Hours: 4 Maximum Marks: 100 Examination Duration: 3 hours

Unit

Course Inputs

- I. **Introduction to Retail Business** (12 hours): Definition – Functions of Retailing - Types of Retailing – Forms of Retail Business Ownership; Retail Theories – Wheel of Retailing – Retail Life Cycle; Retail Business in India: Influencing Factors – Present Indian Retail Scenario and International Perspective in Retail Business.
- II. **Consumer Behavior in Retail Business** (14 hours): Buying Decision Process and its Implications on Retailing – Influence of Group and Individual Factors, Customer Shopping Behaviour, Customer Service and Customer Satisfaction; Retail Planning Process: Factors to consider in preparing a Business Plan – Implementation and Risk Analysis.
- III. **Retail Operations** (12 hours): Factors influencing Location of Store - Market Area Analysis – Trade Area Analysis – Rating Plan Method - Site Evaluation; Retail Operations: Stores Layout and Visual Merchandising, Stores Designing, Space

Planning, Inventory Management, Merchandise Management, and Category Management.

- IV. **Retail Marketing Mix** (16 hours): Introduction; Product: Decisions related to selection of Goods (Merchandise Management Revisited) – Decisions related to Delivery of Service; Pricing: Influencing Factors – Approaches to Pricing – Price Sensitivity - Value Pricing – Markdown Pricing; Place: Supply Channel – SCM Principles – Retail Logistics – Computerized Replenishment System – Corporate Replenishment Policies; Promotion: Setting Objectives – Communication Effects - Promotional Mix; Human Resource Management in Retailing – Manpower Planning – Recruitment and Training – Compensation and Performance Appraisal Methods.
- V. **Impact of Information Technology in Retailing** (10 hours): Non Store Retailing (E-Retailing) - Impact of Information Technology in Retailing - Integrated Systems and Networking – EDI – Bar Coding – Electronic Article Surveillance – Electronic Shelf Labels – Customer Database Management System; Legal aspects in Retailing, Social Issues in Retailing, and Ethical Issues in Retailing.

Skill Development Activities:

- (1) Draw a retail life cycle chart and list the stages
- (2) Draw a chart showing a store operations
- (3) List out the major functions of a store manager diagrammatically
- (4) List out the current trends in e-retailing
- (5) List out the factors influencing in the location of a New Retail outlet

Recommended Books for Reference:

- (1) Suja Nair; Retail Management, HPH
- (2) Karthic – Retail Management, HPH
- (3) S.K. Poddar & others – Retail Management, VBH
- (4) R.S Tiwari ; Retail Management, HPH
- (5) Barry Bermans and Joel Evans: "Retail Management – A Strategic Approach", 8th edition, PHI
- (6) A.J. Lamba, The Art of Retailing, 1st edition, Tata McGraw-Hill, New Delhi
- (7) Swapna Pradhan, Retailing Management, TMH
- (8) K. Venkataramana, Retail Management, SHBP
- (9) James R. Ogden and Denise T., Integrated Retail Management
- (10) A Sivakumar Retail Marketing , Excel Books

Specialization Stream – C: Banking and Insurance Stream

B.Com, Semester – V

Course – 507C: Advanced Bank Management

Course Objective: To acquaint students about the advanced aspects of banking system

Pedagogy: Combination of lectures, assignments and group discussions

Weekly Teaching Hours: 4 Maximum Marks: 100 Examination Duration: 3 hours

Unit

Course Inputs

- I. **Branch Operation and Core Banking** (14 hours): Introduction and Evolution of Bank Management – Technological Impact on Banking Operation – Total Branch Computerization – Concept of Opportunities – Centralized Banking – Concept, Opportunities, Challenges and Implementation.
- II. **Delivery Channels** (14 hours): Delivery Channels – Automated Teller Machine (ATM) – Phone Banking – Call Centers – Internet Banking – Mobile Banking – Payment Gateways – Card Technologies and MICR Electronic Clearing.

- III. **Back Office Operations** (12 hours): Bank Back Office Management – Inter Branch Reconciliation – Treasury Management – Forex Operations – Risk Management – Data Center Management – Network Management – Knowledge Management (MIS/DSS/EIS) and Customer Relationship Management (CRM).
- IV. **Inter Bank Payment System** (12 hours): Interface with Payment System Network – Structured Financial Messaging System – Electronic Fund Transfer – RTGSS – Negotiated Dealing Systems and Securities Settlement Systems – Electronic Money and E- Cheques.
- V. **Contemporary Issues in Banking Techniques** (12 hours): Analysis of Rangarajan Committee Reports – E Banking Budgeting and Banking Software.

Skill Development Activities:

- (1) Filling of application for opening a Bank Account
- (2) Preparations of Bank Reconciliation Statement
- (3) Identify and compare the banking delivery channels of nationalized banks and private banks
- (4) List out the boons and the banes of computerization of banks operations
- (5) Current issues in banking technology to be discussed in class

Recommended Books for Reference:

- (1) Kaptan S S and Choubey N S, E-Indian Banking in Electronic Era, Sarup & Sons, New Delhi
- (2) Vasudeva, E-Banking, Common Wealth Publishers, New Delhi
- (3) Chandramohan: Fundamental of Computer Network I.K. International Publishers
- (4) Effraim Turban, Rainer R. Kelly, Richard E. Potter, Information Technology, John Wiley & Sons Inc
- (5) Andrew S. Tanenbaum, Computer Networks, Tata McGraw Hill,
- (6) Padwal & Godse : Transformation of Indian Banks with Information Technology

Specialization Stream – C: Banking and Insurance Stream

B.Com, Semester – VI

Course – 607C: Life and General Insurance

Course Objective: To acquaint students about the principles of managing and administration of insurance business

Pedagogy: Combination of lectures, assignments and group discussions.

Weekly Teaching Hours: 4 Maximum Marks: 100 Examination Duration: 3 hours

Unit

Course Inputs

- I. **Introduction to Life Insurance** (14 hours): Introduction to Life Insurance - Principles of Life Insurance - Life Insurance Products, Pensions and Annuities - Life Insurance Underwriting - Need for Selection - Factors affecting Rate of Mortality - Sources of Data - Concept of Extra Mortality - Numerical Methods of Undertaking and Occupational Hazards.
- II. **Legal Aspects of Life Insurance** (14 hours): Legal Aspects of Insurance - Indian Contract Act, Special Features of Insurance Contract; Insurance Laws, Insurance Act, LIC Act, and IRDA Act.
- III. **Claim Management and Re-Insurance** (12 hours): Claim Management - Claim Settlement - Legal Framework - Third Party Administration, Insurance Ombudsman - Consumer Protection Act - Re-Insurance in Life Insurance - Retention Limits - Methods of Re-Insurance.
- IV. **Introduction to General Insurance** (12 hours): Introduction to General Insurance;

Principles of General Insurance, Types of General Insurance - Personal General Insurance Products (Fire, Personal Liability, Motors, Miscellaneous Insurance); Terminology, Clauses and Covers, Risk Assessment, Underwriting and Ratemaking, Product Design, Development and Evaluation and Loss of Provincial Control.

- V. **Insurance Industry** (12 hours): Insurance Industry - Brief History - Pre Nationalization and Post Nationalization - Current Scenario, and Re-Insurance – Functions.

Skill Development Activities:

- (1) Calculation of policy premium with imaginary figures
- (2) Calculation of fair claims with imaginary figures
- (3) Preparation of list occupational hazards under life insurance
- (4) List out top 10 private life insurance companies
- (5) Write a note on the current developments under IRDA Act

Recommended Books for Reference:

- (1) Annie Stephen L, HPH
- (2) P. Perya Swamy, Principles and Practice of Life Insurance
- (3) Raman B, Your Life Insurance, Hand Book
- (4) William C. Arthur, Risk Management and Insurance
- (5) G. Krishna Swamy, A Text book on Principles and Practices of Life Insurance
- (6) Gopal Krishnan, Liability Insurance
- (7) Aramvalarthan, Risk Management I.K. Intl
- (8) Mishra M.N, Insurance Principles and Practice
- (9) Bose A.K, Engineering Insurance
- (10) Fire Insurance Claim, Insurance institute of India
- (11) P. K Gupta, Insurance and Risk Management

Specialization Stream – D: E-commerce Stream

B.Com, Semester – V

Course – 507D: E-Commerce – I

Course Objective: To acquaint students about programming language ‘C’

Pedagogy: Combination of lectures, assignments and group discussions

Weekly Teaching Hours: 4 Maximum Marks: 100 Examination Duration: 3 hours

Unit

Course Inputs

- I. **E-Commerce** (8 hours): E-Commerce Vs E-Business, Advantages of E-Commerce, Internet Banking - Advantages of Online Banking, Facilities, Internet Banking in India, ATM, Credit Card/Debit Card, Smart Card; Advantages of Internet Marketing, and Advertising over Internet.
- II. **Introduction to HTML** (10 hours): HTML Documentation, Structure and Tags, Defining Web Page Appearance, Text Formatting, Writing simple HTML Documents, Front Page, Advantages and Options.
- III. **Introduction To ‘C’** (3 hours): History of ‘C’, Features and Merits of ‘C’, Basic Structure of a ‘C’ Program, Character Set, Key Words, Identifiers, Data Types, Constants and Variables, Data Type Declaration Statement, Assigning Values to a Variable, Operators, Expressions, Loading, Editing, Saving and Executing C Programs, and Turbo ‘C’ Hot Keys
- IV. **Input/Output Statements** (15 hours): Input/Output Statements - Unformatted (Getchar; Puchar; Gets; Puts; Getch; Gerche) and Formatted I/O Functions (Scanf; Printf); Program Flow Control Statements, Branching Statements, Looping Statements,

Jumping Statements, If Statement, If-else Statement, Switch Statement, While Statement, Do-While Statement, For Statement, and Nested for Loop Statement.

- V. **Arrays** (8 hours): One Dimensional Array, Two Dimensional Array, and Library Functions (Abs, Sqrt, Pow).
- VI. **Writing Simple Programmes Using ‘C’** (20 hours): Language involving Arithmetical Operations on Numbers, Number Generations of Various Types - Natural Numbers, Even and Odd Numbers, Multiplication Table, Fibonacci Series, Factorial of A Number, Array Addition, Inverse of Matrix, Use of Formulas - Simple Interest, Compound Interest, Area Calculations, etc.

Skill Development Activities:

- (1) Write a C Program to find the area and circumference of the circle
- (2) Write a C Program to show the use of Char and String used
- (3) Write a C Program to the use of Do and While statement
- (4) Write a C Program to show the use of mul and pow functions
- (5) Write a Program to display the growth of a fixed deposit in a bank
- (5) Write a C Program for finding Biggest and Smallest among many numbers using array
- (5) Write a C Program to show the use of Switch Case
- (5) Write a C Program for calculation of salesman's commission
- (5) Write a C Program for preparation of marks statement
- (5) Write a C Program to show arithmetical operations on numbers
- (5) Write a C Program to calculate simple interest and compound interest
- (5) Write a C program to find whether the number is a perfect square or not
- (5) Write a HTML document for display of an Advertisement message with suitable tags
- (5) Write a HTML document to show a moving message on the screen

Recommended Books for Reference:

- (1) Rajaraman, Computer Programming in ‘C’ (Prentice Hall of India).
- (2) Yashwanth, P. Kanetkar, Let Us C (BPB Publications).
- (3) Byron S Gottrifried, Programming with C (Tata McGraw Hill Publishing Co. Ltd)

Specialization Stream – D: E-commerce Stream

B.Com, Semester – VI

Course – 607D: E-Commerce – II

Course Objective: To acquaint students with knowledge about internet and visual basics

Pedagogy: Combination of lectures, assignments and group discussions.

Weekly Teaching Hours: 4 Maximum Marks: 100 Examination Duration: 3 hours

Unit

Course Inputs

- I. **Introduction to Internet** (6 hours): Meanings of Internet and Intranet, Modem, LAN, WAN, MAN, WWW; Advantages and Disadvantages of Internet.
- II. **Email** (6 hours): Meaning, Advantages, Steps in Creating E-Mail ID, Internet Browsing, Information through Web-Sites, Search Engines, and Browser (Internet Explorer).
- III. **Power Point** (16 hours): Start, End, Open, Format, Edit, Print and Save a Presentation; Insert, Format and Modify Text, Select a Design Template, Create a Title Slide, Create a Multi-Level Bulleted List Slide, Display and Print in Black and White, Describe Speech Recognition Capabilities of Power Point, Add Slides to and Delete Slides from a Presentation; Create a Presentation from an Outline and Use Outline Features, Change the Slide Layout, Insert and Edit Clip Art, Add a Header and Footer, Add

Animation and Slide Transition Effect, Create Presentation using Embedded Visuals, Create a Slide Background using a Picture, Customize Graphical Bullets, Create and Embed an Organizational Chart, Insert and Format a Table into a Slide, Add an Animation Scheme to selected Slides, Print Handouts, and Rearrange Slides.

- IV. **Introduction to Visual Basic Programming** (12 hours): Introduction to Visual Basic, Terminologies, Creating an Application, Modular Environment; Building an Application, Setting Properties of Objects, Forms; Introduction to Controls; Event-Driven Programming.
- V. **B Coding: Examining Code** (12 hours): Using Object Browser, Statements and Functions, Conditional Statements and Looping Statements in Visual Basic; Native Code Compiler; Debugging, Overview of Debugging, Forms, Using Forms, Multiple Forms, Events; Start Up and End of Application Variables, Data Types, Scope and Life Time of Variables, Constants, Arrays and User-Defined Types.
- VI. **Procedure** (12 hours): Introduction to Procedure, Arguments and Parameters; Named Arguments and Optional Arguments; Controls – Using Controls, and Standard Controls (Custom Controls).

Skill Development Activities:

- (1) Write the steps for addition of any two numbers in Visual Basic
- (2) Write the steps for Swapping two numbers in Visual Basic
- (3) Write the steps for finding Simple Interest/Compound Interest in Visual Basic
- (4) Write the steps for creating Presentation having atleast five slides related to a new product launching
- (5) Write the steps for creating Presentation having atleast four or five slides related to motivating the salesmen

Recommended Books for Reference:

- (1) U. S. Pandey, Rahul Srivastava and Others, E-Commerce and Its Applications (S. Chand & Co)
- (2) Kamlesh N. Agarwal and Deeksha Agarwal, Business on the Net (McMillan India Ltd)
- (3) Jerke, Visual Basic
- (4) White, Visual Basic Programming

Specialization Stream – E: Quantitative Techniques Stream

B.Com, Semester – V

Course – 507E: Quantitative Techniques – I

Course Objective: To acquaint students about the application of mathematical and statistical techniques to practical business problems

Pedagogy: Combination of lectures, assignments and group discussions.

Weekly Teaching Hours: 4 Maximum Marks: 100 Examination Duration: 3 hours

Unit

Course Inputs

- I. **Arithmetic and Geometric Progression** (8 hours): Arithmetic Progression, Geometric Progression, Some of n^{th} Term of Arithmetic Progression and Geometric Progression, Arithmetic Mean and Geometric Mean.
- II. **Matrices and Determinants Matrices** (13 hours): Matrices, Types of Matrices; Operation of Addition, Subtraction and Multiplication of Matrix with Special Application to Business; Transpose of Matrix, Determinants of Square Matrix, Cramer's Rule with Two and Three Unknown Properties, Adjoint of a Square Matrix, and Inverse of a Square Matrix (excluding Matrix Method).
- III. **Differential Calculus** (13 hours): Variables and Constant, Function, Real/Valued

Function, Limits of Function, Methods of Evaluating Limits, Differentiation of Linear Function, Finding Maxima and Minima of a Function, Application of Differential to Commerce, (excluding Derivations).

- IV. **Linear Programming** (14 hours): Linear Inequalities, Linear Programming, Formation of Linear Programming Problems, Mode/Solutions to Linear Programming Problems by Graphic and Simplex Method (problems to be restricted to two variables).
- V. **Theory of Probability** (10 hours): Introduction, Random Experiments, Sample Space and Probability, Theory of Expectations, Random Variables, Problems related to Probability based on Combination, Law of Probability, Events, and Compound Events.
- VI **Theoretical Distribution** (6 hours): Introduction, Binomial Distribution, Poisson Distribution, Normal Distribution, and Problems

Skill Development Activities:

- (1) Apply Arithmetic Progression and Geometric Progression methods to find the growth rate of food grains and population
- (2) Use Matrix Principles to implement food requirement and protein for two families. Show the way in which price and demand situations will help to purchase goods and services by the use of matrices
- (3) Select different ways to go to Bengaluru from your native place through permutation techniques
- (4) Use different techniques to show price, supply and demand position for a particular product, and also show maximum and minima
- (5) Visit a nearest Industry or Computer Centre and draw Linear Programming Problem model regarding different problems. Find a solution to the problem

Recommended Books for Reference:

- (1) Business Mathematics, Sanchethi Kapoor
- (2) Business Mathematics, S. P. Gupta
- (3) Mathematics for Cost Accountants, R. Gupta
- (4) Business Mathematics: Madappa and Sridhara Rao
- (5) Business Mathematics: Dorairaj, S. N
- (6) Business Mathematics: B. H. Suresh
- (7) Business Mathematics: Sanchethi Aggarwal
- (8) Business Mathematics: Aggarwal
- (9) Business Mathematics: Oak and other (Himalaya Publishing House)

Specialization Stream – E: Quantitative Techniques Stream

B.Com, Semester – VI

Course – 607E: Quantitative Techniques – II

Course Objective: To acquaint students with the application of mathematical techniques to business situations

Pedagogy: Combination of lectures, assignments and group discussions

Weekly Teaching Hours: 4 Maximum Marks: 100 Examination Duration: 3 hours

Unit

Course Inputs

- I. **Games and Strategies** (10 hours): Introduction to Games, Two-Person Zero-Sum Games, Some Basic Terms, the Maxi-min– Mini-max Principle, Games without Saddle Points - Mixed.
- II. **Assignment Problems** (10 hours): Introduction, Mathematical Function of the Problems, Assignment Cases in Assignment Problems, Typical Assignment Problem, and Travelling Salesman Problem.

- III. **Transportation Problems** (12 hours): Introduction, General Transportation Problem, Transportation Table, Duality in Transportation Problem, Loops in Transportation Problem, LP Formulation of the Transportation Problem, Solution of a Transportation Problem, Finding an Initial Basic Feasible Solution, and Test for Optimality
- IV. **Decision Analysis** (10 hours): Introduction, Decision Making Problem, Decision Making Process, Decision Making Environment, Decision under Uncertainty, Decisions under Risk, and Decision Tree Analysis.
- V. **Simulation** (12 hours): Introduction, Why Simulation, Methodology of Simulation, Simulation Models, Event-Type Simulation; Generation of Random Numbers; Monte-Carlo Simulation, Simulation of Inventory Problems, Simulation of Queuing System, Simulation of Maintenance Problems, Simulation of Investment and Budgeting, Simulation of Job Sequencing, Advantages and Limitations of Simulation.
- VI. **Project Management** (10 hours): Introduction, Basic Concepts of Network Analysis, Time Estimates in Vertical Path Analysis, PERT and CPM, Simple Problems on PERT and CPM.

Skill Development Activities:

- (1) Play game for competing with the rival trader, find Games Strategies to withstand in the game
- (2) Give an assignment to a particular person who is capable to find suitable measures to particular assigned task
- (3) Find the least route to go to the places when a travelling agent is supposed to visit more than two places simultaneously
- (4) Find strategies for assigning a particular task to various persons
- (5) How simulation can be derived and give suitable examples
- (6) Experiment different events for finding solution for probable events

Recommended Books for Reference:

- (1) Business Mathematics, Sanchethi Kapoor
- (2) Business Mathematics, S. P. Gupta
- (3) Mathematics for Cost Accountants, R. Gupta
- (4) Business Mathematics: Madappa Sridhara Rao
- (5) Business Mathematics: Dorairaj, S. N
- (6) Business Mathematics: B. H. Suresh
- (7) Business Mathematics: Sanchethi Aggarwal
- (8) Business Mathematics: Aggarwal
- (9) Business Mathematics: Oak and other (Himalaya Publishing House)
- (10) Kanti Swarup, P. K Gupta Man Mohan, Operations Research
- (11) V. K. Kapoor, Quantitative Techniques

Question Paper Pattern for Semester-end Examinations

[Each Question Paper shall be divided into three Sections *viz.*, Section – A (Conceptual), Section – B (Analytical) and Section – C (Application)]

Section – A:

Maximum Marks: 15,

Three Questions shall be answered out five Questions (including three Problems in the case of Quantitative Courses),

Each question carries five marks, and

Answer to each theory question shall be in not more than two pages.

Section – B:

Maximum Marks: 20,

Two Questions shall be answered out four Questions (including three Problems in the case of Quantitative Courses),

Each Question carries ten marks, and

Answer to each theory Question shall be in not more than five pages.

Section – C:

Maximum Marks: 45,

Three Questions shall be answered out five Questions (including four Problems in the case of Quantitative Courses),

Each Question carries 15 marks, and

Answer to each theory Question shall be in not more than eight pages.

Note: Calculators, Mathematical Tables and Present Value Tables are allowed.

**Question Paper Pattern for Course – 508: Logical and Analytical Reasoning
(B.Com, Semester – V)**

Duration: 90 minutes,

Maximum Marks: 40,

40 multiple answer questions and all are compulsory, and

Each question carries 1 mark.

**Question Paper Pattern for Course – 608: Soft Skills
(B.Com, Semester – VI)**

Duration: 90 minutes,

Maximum Marks: 40,

Students shall answer 8 questions out of 10 questions, and

Each question carries 5 marks.

**Question Paper Pattern
for**

**Course – 307: Environmental Science (B.Com, Semester - III) and
Course – 407: Indian Constitution (B.Com, Semester - IV)**

Duration: 3 hours,

Maximum Marks: 80,

80 multiple answer questions and all are compulsory, and
Each question carries 1 mark.

KUVEMPU



UNIVERSITY

NEP-2020

curriculum structure and Syllabus

Bachelor of Science (Basic and Honors) Programme with
Computer Science as Major and Minor Courses

And

Open Elective courses in Computer Science

w.e.f Academic Year 2021-22 onwards

UG BOS IN COMPUTER SCIENCE

The objectives of the Program

1. The primary objective of this program is to provide a foundation of computing principles for effectively using information systems and enterprise softwares.
2. It helps students analyze the requirements for system programming and exposes students for information systems
3. This programme provides students with options to specialize in various software system.
4. To produce outstanding Computer Scientists who can apply the theoretical knowledge into practice in the real world and develop standalone live projects themselves
5. To provide opportunity for the study of modern methods of information processing and its applications.
6. To develop among students the programming techniques and the problem-solving skills through programming
7. To prepare students who wish to go on to further studies in computer science and related subjects.
8. To acquaint students to Work effectively with a range of current, standard, Office Productivity software applications

Program Outcomes

1. Discipline knowledge: Acquiring knowledge on basics of Computer Science and ability to apply to design principles in the development of solutions for problems of varying complexity
2. Problem Solving: Improved reasoning with strong mathematical ability to Identify, formulate and analyze problems related to computer science and exhibiting a sound knowledge on data structures and algorithms.
3. Design and Development of Solutions: Ability to design and development of algorithmic solutions to real world problems.
4. Programming a computer: Exhibiting strong skills required to program a computer for various issues and problems of day-to-day scientific applications.
5. Application Systems Knowledge: Possessing a minimum knowledge to practice existing computer application software.
6. Communication: Must have a reasonably good communication knowledge both in oral and writing.
7. Ethics on Profession, Environment and Society: Exhibiting professional ethics to maintain the integrality in a working environment and also have concern on societal impacts due to computer-based solutions for problems.
8. Lifelong Learning: Should become an independent learner. So, learn to learn ability.
9. Motivation to take up Higher Studies: Inspiration to continue educations towards advanced studies on Computer Science.

Additional Program Outcomes for B.Sc (Hons) in Computer Science

The four years Bachelors in Computer Science (Hons) program enables students to attain the following additional attributes besides the afore-mentioned attributes:

1. Apply standard Software Engineering practices and strategies in real-time software project development
2. Design and develop computer programs/computer-based systems in the areas related to AI, algorithms, networking, web design, cloud computing, IoT and data analytics.
3. Acquaint with the contemporary trends in industrial/research settings and thereby innovate novel solutions to existing problems
4. The ability to apply the knowledge and understanding noted above to the analysis of a given information handling problem.
5. The ability to work independently on a substantial software project and as an effective team member.

Curriculum Structure

Program: B.Sc. (Basic and Honors) Subject: Computer Science

1. Computer Science as MAJOR with another Subject as MINOR (Table IIA of Model Curriculum)

Sem	Discipline Specific Core Courses (DSC)	Hour of Teaching/ Week		Discipline Specific Elective Courses (DSE)/ Vocational Courses (VC)	Hour of Teaching / Week
		Theory	Lab		
1	DSC-1: Computer Fundamentals and Programming in C DSC-1Lab: C Programming Lab	4	4		
2	DSC-2: Data Structures using C DSC-2Lab: Data structures Lab	4	4		
3	DSC-3: Object Oriented Programming Concepts and Programming in JAVA DSC-3Lab: JAVA Lab	4	4		
4	DSC-4: Database Management Systems DSC-4Lab: DBMS Lab	4	4		
5	DSC-5: Programming in PYTHON DSC-6: Computer Networks DSC-5Lab: PYTHON Programming lab DSC-6Lab: Computer Networks Lab	3 3	4 4	VC-1: Any one from Vocational Courses, Group – 1*	3
6	DSC-7: Internet Technologies DSC-8: Operating System Concepts DSC-7Lab: JAVA Script, HTML, CSS Lab DSC-8Lab: C# Programming Lab	3 3	4 4	VC-2: Any one from Vocational Courses, Group – 2* Internship:	3 2
7	DSC-9: Computer Graphics and Visualization DSC-10: Design and Analysis of Algorithms DSC-11: Software Engineering DSC-9Lab: Computer Graphics and Visualization Lab DSC-10Lab: Algorithms Lab	3 3 3	4 4	DSE-1: Any one from Discipline Specific Elective Courses, Group – 1** DSE-2: Any one from Discipline Specific Elective Courses, Group – 2** Research Methodology:	3 3 3
8	DSC-12: Artificial Intelligence and Applications DSC-13: Computer Organization and Architecture DSC-14: Data Warehousing and Data Mining DSC-12Lab: AI Lab	3 3 3	4	DSE-3: Any one from Discipline Specific Elective Courses, Group – 3** Research Project:	3 6

2. Computer Science as MINOR with another Subject as MAJOR (As per Table IIA of Model Curriculum)

Sem	Discipline Specific Core Courses (DSC)	Hour of Teaching/ Week	
		Theory	Lab
1	DSC-1: Computer Fundamentals and Programming in C DSC-1Lab: C Programming Lab	4	4
2	DSC-2: Data Structures using C DSC-2Lab: Data structures Lab	4	4
3	DSC-3: Object Oriented Programming Concepts and Programming in JAVA DSC-3Lab: JAVA Lab	4	4
4	DSC-4: Database Management Systems DSC-4Lab: DBMS Lab	4	4
5	DSC-5: Programming in PYTHON DSC-5Lab: PYTHON Programming lab	3	4
6	DSC-6: Internet Technologies DSC-6Lab: JAVA Script, HTML, CSS Lab	3	4

* Vocational Courses:

<p>Group-1:</p> <ul style="list-style-type: none"> • DTP, CAD and Multimedia • Hardware and Server Maintenance • Web Content Management Systems • E-Commerce • Web Designing 	<p>Group-2:</p> <ul style="list-style-type: none"> • Health Care Technologies • Digital Marketing • Office Automation • Multimedia Processing • Accounting Package
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** Discipline Specific Elective Courses:

<p>Group-1:</p> <ul style="list-style-type: none"> • IoT • Cyber Law and Cyber Security • Web Programming - PHP and MySQL • Clouds, Grids, and Clusters • Software Testing 	<p>Group-2:</p> <ul style="list-style-type: none"> • Information and Network Security • Data Compression • Discrete Structures • Opensource Programming • Multimedia Computing • Big Data 	<p>Group-3:</p> <ul style="list-style-type: none"> • Data Analytics • Storage Area Networks • Pattern Recognition • Digital Image Processing • Parallel Programming • Digital Signal Processing
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Open Electives in Computer Science

Sl. No.	Semester	Open Electives
01	FIRST SEMESTER	<u>Any one from the following</u> <ul style="list-style-type: none">• Office Automation• Computer Fundamentals• Problem Solving and C Programming Concepts
02	SECOND SEMESTER	<u>Any one from the following except elective chosen in the first semester</u> <ul style="list-style-type: none">• Office Automation• Computer Fundamentals• Problem Solving and C Programming Concepts
03	THIRD SEMESTER	<u>Any one from the following</u> <ul style="list-style-type: none">• Web Designing• E-Commerce
04	FOURTH SEMESTER	<u>Any one from the following except elective chosen in the third semester</u> <ul style="list-style-type: none">• Web Designing• E-Commerce

Syllabus for B.Sc. (Basic and Honors)

Semester: I

Course Code: DSC-1	Course Title: Computer Fundamentals and Programming in C
Course Credits: 04	Hour of Teaching/Week: 04
Total Contact Hours: 52	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 03

Course Content

Content	Hours
Unit - 1	
Fundamentals of Computers: Introduction to Computers - Computer Definition, Characteristics Computers, Evolution and History of Computers, Types of Computers, Basic Organisation of a Digital Computer; Number Systems – different types, conversion from one number system to another; Computer Codes – BCD, Gray Code, ASCII and Unicode; Boolean Algebra – Boolean Operators with Truth Tables; Types of Software – System Software and Utility Software; Computer Languages - Machine Level, Assembly Level & High Level Languages, Translator Programs – Assembler, Interpreter and Compiler; Planning a Computer Program - Algorithm, Flowchart and Pseudo code with Examples. (at least 5hrs)	10
Unit - 2	
Introduction to C Programming: Over View of C; History and Features of C; Structure of a C Program with Examples; Creating and Executing a C Program; Compilation process in C. C Programming Basic Concepts: C Character Set; C tokens - keywords, identifiers, constants, and variables; Data types; Declaration & initialization of variables; Symbolic constants. Input and output with C: Formatted I/O functions - <i>printf</i> and <i>scanf</i> , control stings and escape sequences, output specifications with <i>printf</i> functions; Unformatted I/O functions to read and display single character and a string - <i>getchar</i> , <i>putchar</i> , <i>gets</i> and <i>puts</i> functions.	8
Unit - 3	
C Operators & Expressions: Arithmetic operators; Relational operators; Logical operators; Assignment operators; Increment & Decrement operators; Bitwise operators; Conditional operator; Special operators; Operator Precedence and Associativity; Evaluation of arithmetic expressions; Type conversion.	12
Control Structures: Decision making Statements - <i>Simple if</i> , <i>if_else</i> , <i>nested if_else</i> , <i>else_if ladder</i> , <i>Switch-case</i> , <i>goto</i> , <i>break</i> & <i>continue</i> statements; Looping Statements - Entry controlled and exit controlled statements, <i>while</i> , <i>do-while</i> , <i>for</i> loops, Nested loops.	
Unit - 4	

<p>Arrays: One Dimensional arrays - Declaration, Initialization and Memory representation; Two Dimensional arrays - Declaration, Initialization and Memory representation.</p> <p>Strings: Declaring & Initializing string variables; String handling functions - <i>strlen</i>, <i>strcmp</i>, <i>strcpy</i> and <i>strcat</i>; Character handling functions - <i>tolower</i>, <i>toupper</i>, <i>isalpha</i>, <i>isnumeric</i> etc.</p> <p>Pointers in C: Understanding pointers - Declaring and initializing pointers, accessing address and value of variables using pointers; Pointers and Arrays; Pointer Arithmetic; Advantages and disadvantages of using pointers;</p>	12
Unit - 5	
<p>User Defined Functions: Need for user defined functions; Format of C user defined functions; Components of user defined functions - return type, name, parameter list, function body, return statement and function call; Categories of user defined functions - With and without parameters and return type.</p> <p>User defined data types: Structures - Structure Definition, Advantages of Structure, declaring structure variables, accessing structure members, Structure members initialization, comparing structure variables, Array of Structures; Unions - Union definition; difference between Structures and Unions.</p>	10

Text Books

1. Pradeep K. Sinha and Priti Sinha: Computer Fundamentals (Sixth Edition), BPB Publication
2. E. Balagurusamy: Programming in ANSI C (TMH)

References

1. Kamathane: Programming with ANSI and TURBO C (Pearson Education)
2. V. Rajaraman: Programming in C (PHI – EEE)
3. S. Byron Gottfried: Programming with C (TMH)
4. Kernighan & Ritchie: The C Programming Language (PHI)
5. Yashwant Kanitkar: Let us C
6. P.B. Kottur: Programming in C (Sapna Book House)

Course Code: DSC-1Lab	Course Title: C Programming Lab
Course Credits: 02	Hour of Teaching/Week: 04
Total Contact Hours: 52	Formative Assessment Marks: 25
Exam Marks: 25	Exam Duration: 04

Practice Lab

The following activities be carried out/ discussed in the lab during the initial period of the semester.

1. Basic Computer Proficiency
 - a. Familiarization of Computer Hardware Parts
 - b. Basic Computer Operations and Maintenance.
 - c. Do's and Don'ts, Safety Guidelines in Computer Lab
2. Familiarization of Basic Software – Operating System, Word Processors, Internet Browsers, Integrated Development Environment (IDE) with Examples.
3. Type Program Code, Debug and Compile basic programs covering C Programming fundamentals discussed during theory classes.

Programming Lab

Part A:

1. Write a C Program to read radius and find area and volume of a sphere.
2. Write a C Program to read three numbers and find the biggest of three
3. Write a C Program to demonstrate library functions in *math.h* (at least 5)
4. Write a C Program to read a number, find the sum of the digits, reverse the number and check it for palindrome
5. Write a C Program to read numbers from keyboard continuously till the user presses 999 and to find the sum of only positive numbers
6. Write a C Program to read percentage of marks and to display appropriate grade (using switch case)
7. Write a C Program to find the roots of quadratic equation (if else ladder)
8. Write a C program to read marks scored in 3 subjects by n students and find the average of marks and result (Demonstration of single dimensional array)
9. Write a C Program to remove Duplicate Element in a single dimensional Array
10. Program to perform addition and subtraction of Matrices

Part B:

1. Write a C Program to find the length of a string without using built in function
2. Write a C Program to demonstrate string functions (at least 3).
3. Write a C Program to demonstrate pointers in C
4. Write a C Program to generate n prime number by defining *isprime ()* function
5. Write a C Program to find the trace of a square matrix using function
6. Write a C Program to read, display and multiply two matrices using functions
7. Write a C Program to read a string and to find the number of alphabets, digits, vowels, consonants, spaces and special characters.
8. Write a C Program to Reverse a String using Pointer
9. Write a C Program to demonstrate student structure to read & display records of n students.
10. Write a C Program to demonstrate the difference between structure & union.

Note: Student has to execute a minimum of 8 programs in each part to complete the Lab course

Evaluation Scheme for Lab Examination

Assessment Criteria		Marks
Program -1 from Part A	Write up of the program -1	5
Program -2 from Part B	Write up of the program -2	5
Execution and formatting (Any one program)		10
Viva Voce based on Lab Activities		05
Total		25

Semester: II

Course Code: DSC-2	Course Title: Data Structures using C
Course Credits: 04	Hour of Teaching/Week: 04
Total Contact Hours: 52	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 03

Course Outcomes (COs):

After completing this course satisfactorily, a student will be able to:

- Describe how arrays, records, linked structures, stacks, queues, trees, and graphs are represented in memory and used by algorithms
- Describe common applications for arrays, records, linked structures, stacks, queues, trees, and graphs
- Write programs that use arrays, records, linked structures, stacks, queues, trees, and graphs
- Demonstrate different methods for traversing trees
- Compare alternative implementations of data structures with respect to performance
- Describe the concept of recursion, give examples of its use
- Discuss the computational efficiency of the principal algorithms for sorting and searching

Course Content

Content	Hours
Unit - 1	
Introduction to data structures: Definition; Types of data structures - Primitive & Non-primitive, Linear and Non-linear; Operations on data structures. Algorithm Specification, Performance Analysis, Performance Measurement Recursion: Definition; Types of recursions; Examples - Fibonacci numbers, GCD, Binomial coefficient nC_r , Towers of Hanoi; Comparison between iterative and recursive functions.	8
Unit - 2	
Arrays: Basic Concepts – Definition, Declaration, Initialization, Operations on arrays; Types of arrays; Arrays as abstract data types (ADT); Representation of Linear Arrays in memory; Traversing linear arrays; Inserting and deleting elements; Sorting – Selection sort, Bubble sort, Quick sort, Insertion sort, merge sort; Searching - Sequential Search, Binary search; Iterative and Recursive searching; Multidimensional arrays; Representation of multidimensional arrays; Sparse matrices.	12

Unit - 3	
Stacks: Basic Concepts – Definition and Representation of stacks; Operations on stacks; Applications of stacks; Infix, postfix and prefix notations; Conversion from infix to postfix using stack; Evaluation of postfix expression using stack; Application of stack in function calls. Queues: Basic Concepts – Definition and Representation of queues; Types of queues – Simple queues, Circular queues, Double ended queues, Priority queues; Operations on Simple queues;	10
Unit - 4	
Dynamic memory allocation: Static & Dynamic memory allocation; Memory allocation and de- allocation functions - malloc, calloc, realloc and free. Linked list: Basic Concepts – Definition and Representation of linked list, Types of linked lists - Singly linked list, doubly linked list, Header linked list, Circular linked list; Representation of Linked list in Memory; Operations on Singly linked lists – Traversing, Searching, Insertion, Deletion; Memory allocation; Garbage collection	12
Unit - 5	
Trees: Definition; Tree terminologies –node, root node, parent node, ancestors of a node, siblings, terminal & non-terminal nodes, degree of a node, level, edge, path, depth; Binary tree: Type of binary trees - strict binary tree, complete binary tree, binary search tree and heap tree; Array representation of binary tree. Traversal of binary tree; preorder, inorder and postorder traversal; Reconstruction of a binary tree when any two of the traversals are given.	10

Text Books

1. Sartaj Sahani: Fundamentals of Data Structures

References

1. Tanenbaum: Data structures using C (Pearson Education)
2. Kamathane: Introduction to Data structures (Pearson Education)
3. Y. Kanitkar: Data Structures Using C (BPB)
4. Sudipa Mukherjee: Data Structures using C – 1000 Problems and Solutions (McGraw Hill Education, 2007))

Course Code: DSC-2Lab	Course Title: Data Structures Lab
Course Credits: 02	Hour of Teaching/Week: 04
Total Contact Hours: 52	Formative Assessment Marks: 25
Exam Marks: 25	Exam Duration: 04

Programming Lab

Part A:

1. Write a C Program to find GCD using recursive function
2. Write a C Program to display Pascal Triangle using binomial function
3. Write a C Program to generate n Fibonacci numbers using recursive function.
4. Write a C Program to implement Towers of Hanoi.
5. Write a C Program to implement dynamic array, find smallest and largest element of the array.
6. Write a C Program to read the names of cities and arrange them alphabetically using bubble sort.
7. Write a C Program to sort the given list using selection sort technique.
8. Write a C Program to sort the given list using insertion sort technique.

Part B:

1. Write a C Program to sort the given list using quick sort technique.
2. Write a C Program to sort the given list using merge sort technique.
3. Write a C Program to search an element using linear search technique and recursive binary search technique.
4. Write a C Program to implement Stack.
5. Write a C Program to convert an infix expression to postfix.
6. Write a C Program to implement simple queue.
7. Write a C Program to implement linear linked list.
8. Write a C Program to implement traversal of a binary tree.

Evaluation Scheme for Lab Examination

Assessment Criteria		Marks
Program -1 from Part A	Write up of the program -1	5
Program -2 from Part B	Write up of the program -2	5
Execution and formatting (Any one program)		10
Viva Voce based on Lab Activities		05
Total		25

BSc-Semester-III

Course Title: Object Oriented Programming Concepts and Programming in Java	Course code: DSC-3
Total Contact Hours: 52	Course Credits: 04
Formative Assessment Marks: 40	Duration of SEE/Exam: 03 Hours
Summative Assessment Marks: 60	

Course Outcomes (COs):

After completing this course satisfactorily, a student will be able to:

- Understand the features of Java and the architecture of JVM
- Write, compile, and execute Java programs that may include basic data types and control flow constructs and how type casting is done
- Identify classes, objects, members of a class and relationships among them needed for a specific problem and demonstrate the concepts of polymorphism and inheritance
- The students will be able to demonstrate programs based on interfaces and threads and explain the benefits of JAVA's Exceptional handling mechanism compared to other Programming Language
- Write, compile, execute Java programs that include GUIs and event driven programming and also programs based on files

DSC-3: Object Oriented Programming Concepts and Programming in Java

Unit	Description	Hours
1	OOPs Concepts: Basics of OOPs: Object, Class, Data abstraction, Data Hiding, Polymorphism, Inheritance; Introduction to Java: Basics of Java programming, Data types, Variables, Operators, Control structures: Branching, Looping, Labeled Loop; Arrays (1D,2D).	12
2	Object and Classes: Basics of Objects and Classes, Constructors-Definition and Types; Destructors, Finalizer, Visibility modifiers, Java Overloading, Inbuilt classes: String, Character, String Buffer.	09
3	INHERITANCE AND INTERFACES: Inheritance: Definition, Types: Single, Multilevel, hierarchical; Interface: Definition Extending & implementing interface, Generic Programming, Introduction to Package in java.	09
4	Multithreading and Exceptions: Creating a thread, Extending the thread class, stopping and blocking the thread, Thread life cycle, Runnable interface, Exception handling with try-catch-finally, Throwing and Rethrowing exceptions classes, Multiple catch statements, finally clause.	10

5	Event and GUI programming: Event handling in java, Event types, Mouse and key events, GUI Basics, Panels, Frames, Layout Managers: Flow Layout, Border Layout, Grid Layout, GUI components: Buttons, Check Boxes, Radio Buttons, Labels, Text Fields, Text Areas, Combo Boxes, Lists, Scroll Bars, Sliders, Menus, Dialog Boxes, Applet and its life cycle, Introduction to swing.	12
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Text Books

1. Programming with Java, By E Balagurusamy – A Primer, Fourth Edition, Tata McGraw Hill Education Private Limited.
2. Core Java Volume I – Fundamentals, By Cay S. Horstmann, Prentice Hall
3. Object Oriented Programming with Java : Somashekara, M.T., Guru, D.S., Manjunatha, K.S

Reference Books:

1. Java 2 - The Complete Reference – McGraw Hill publication.
2. Java - The Complete Reference, 7th Edition, By Herbert Schildt– McGraw Hill publication.

Course Code: DSC-3Lab	Course Title: JAVA LAB
Course Credits: 02	Hour of Teaching/Week: 04
Total Contact Hours: 52	Formative Assessment Marks: 25
Exam Marks: 25	Exam Duration: 03

Course Outcomes (COs):

After completing this course satisfactorily, a student will be able to:

- Implement Object Oriented programming concept using basic syntaxes of control Structures
- Identify classes, objects, members of a class and the relationships among them needed for a finding the solution to specific problem
- Demonstrates how to achieve reusability using inheritance
- Demonstrate understanding and use of interfaces, packages, different exception handling mechanisms and concept of multithreading for robust faster and efficient application development.
- Identify and describe common user interface components to design GUI in Java using Applet & AWT along with response to events

Practice Lab

1. Program to print the following triangle of numbers 1
1 2
1 2 3
1 2 3 4
1 2 3 4 5
2. Program to simple java application, to print the message, "Welcome to java"
3. Program to display the month of a year. Months of the year should be held in an array.
4. Program to find the area of rectangle.
5. program to demonstrate a division by zero exception
6. Program to create a user defined exception say Pay Out of Bounds.

Programming Lab

PART A: Java Fundamentals OOPs in Java

1. Program to add two integers and two float numbers. When no arguments are supplied, give a default value to calculate the sum. Use function overloading.
2. Program to perform mathematical operations. Create a class called AddSub with methods to add and subtract. Create another class called MulDiv that extends from AddSub class to use the member data of the super class. MulDiv should have methods to multiply and divide A main function should access the methods and perform the mathematical operations.
3. Program with class variable that is available for all instances of a lass. Use static variable declaration. Observe the changes that occur in the object's member variable values.

4. Program to create a student class with following attributes; Enrollment No: Name, Mark of sub1, Mark of sub2, mark of sub3, Total Marks. Total of the three marks must be calculated only when the student passes in all three subjects. The pass mark for each subject is 50. If a candidate fails in any one of the subjects his total mark must be declared as zero. Using this condition write a constructor for this class. Write separate functions for accepting and displaying student details. In the main method create an array of n student objects and display the details.
5. In a college first year class are having the following attributes Name of the class (BCA, BCom, BSc), Name of the staff No of the students in the class, Array of students in the class. Define a class called first year with above attributes and define a suitable constructor. Also write a method called best Student () which process a first-year object and return the student with the highest total mark. In the main method define a first-year object and find the best student of this class
6. Program to define a class called employee with the name and date of appointment. Create ten employee objects as an array and sort them as per their date of appointment. ie, print them as per their seniority.

PART B: Exception Handling & GUI Programming

1. Program to catch Negative Array Size Exception. This exception is caused when the array is initialized to negative values.
2. Program which create and displays a message on the window
3. Program to draw several shapes in the created window
4. Program which creates a frame with two buttons father and mother. When we click the father button the name of the father, his age and designation must appear. When we click mother similar details of mother also appear.
5. Program to move any one shape according to the arrow key pressed.
6. Program to create a window when we press M or m the window displays Good Morning, A or a the window displays Good After Noon E or e the window displays Good Evening, N or n the window displays Good Night
7. Demonstrate the various mouse handling events using suitable example.
8. Program to create menu bar and pull-down menus.

Evaluation Scheme for Lab Examination

Assessment Criteria		Marks
Program -1 from Part A	Write up of the program -1	5
Program -2 from Part B	Write up of the program -2	5
Execution and formatting (Any one program)		10
Viva Voce based on Lab Activities		05
Total		25

BSc-Semester-IV

Course Title: Database Management Systems	Course code: DSC-4
Total Contact Hours: 52	Course Credits: 04
Formative Assessment Marks: 40	Duration of SEE/Exam: 03 Hours
Summative Assessment Marks: 60	

Course Outcomes (COs):

At the end of the course, students will be able to:

- Explain the various database concepts and the need for database systems.
- Identify and define database objects, enforce integrity constraints on a database using DBMS.
- Demonstrate a Data model and Schemas in RDBMS.
- Identify entities and relationships and draw ER diagram for a given real-world problem.
- Convert an ER diagram to a database schema and deduce it to the desired normal form.
- Formulate queries in Relational Algebra, Structured Query Language (SQL) for database manipulation.
- Explain the transaction processing and concurrency control techniques.

Database Management Systems (DBMS)

Unit	Description	Hours
1	Database Architecture: Introduction to Database system applications. Characteristics and Purpose of database approach. People associated with Database system. Data models. Database schema. Database architecture. Data independence. Database languages, and classification of DBMS.	10
2	E-R Model: Entity-Relationship modeling: E – R Model Concepts: Entity, Entity types, Entity sets, Attributes, Types of attributes, key attribute, and domain of an attribute. Relationships between the entities. Relationship types, roles and structural constraints, degree and cardinality ratio of a relationship. Weak entity types, E -R diagram.	10
3	Relational Data Model: Relational model concepts. Characteristics of relations. Relational model constraints: Domain constrains, key constraints, primary & foreign key constraints, integrity constraints and null values. Relational Algebra: Basic Relational Algebra operations. Set theoretical	12

4	<p>SQL and Data Normalization: SQL – DML, DDL, DCL and TCL commands, Aggregate Functions and Grouping. Nested Sub Queries, Views. Normalization - Anomalies in relational database design. Decomposition. Functional dependencies. Normalization. First normal form, Second normal form, Third normal form. Boyce-Codd normal form.</p>	10
5	<p>Introduction to PL/SQL programming: Introduction to PL/SQL • Features and Advantages, PL/SQL Blocks - basic syntax, Variables and their scope, Constants, Literals, Data Types, Operators, Executable Statements.</p> <p>Control Execution Flow • Conditional Control: IF Statements • CASE Statements • Iterative Control: Basic Loops -WHILE and FOR Loops, Reverse FOR LOOP Statement, Nested Loops, Labeling a PL/SQL Loop, exception handling.</p> <p>STRINGS: Declaring String Variables, String Functions and Operators, ARRAYS: Creating a Varray Type. Cursors - Implicit and Explicit Cursors, Cursor Attributes, parameterized Cursor, Functions and procedure – syntax and usage.</p>	10

References:

1. Fundamentals of Database Systems, Ramez Elamassri, Shankant B. Navathe, 7th Edition, Pearson, 2015
2. An Introduction to Database Systems, Bipin Desai, Galgotia Publications, 2010.
3. Introduction to Database System, C J Date, Pearson, 1999.
4. Database Systems Concepts, Abraham Silberschatz, Henry Korth, S.Sudarshan, 6th Edition, McGraw Hill, 2010.
5. Database Management Systems, Raghu Rama Krishnan and Johannes Gehrke, 3rd Edition, McGraw Hill, 2002
6. Oracle Database 11G PL/SQL Programming

Course Code: DSC-4Lab	Course Title: DBMS LAB
Course Credits: 02	Hour of Teaching/Week: 04
Total Contact Hours: 52	Formative Assessment Marks: 25
Exam Marks: 25	Exam Duration: 03

Course Outcomes (COs):

After completing this course satisfactorily, a student will be able to:

- Formulate query, using SQL, solutions to a broad range of query and data update problems
- using SQL in database creation and interaction
- Design a commercial relational database system (Oracle, MySQL) by writing SQL using the system
- Use a desktop database package to create, populate, maintain, and query a database.
- Analyze an information storage problem and derive an information model expressed in the form and views
- Formulate PL SQL query blocks using cursor

Programming Lab

PART A: SQL Queries

1. Implementation of DDL and DML commands of SQL with suitable examples
 - a) Create table b) Alter table c) Drop Table 4) Insert 5) Update 6) Delete
2. Implementation of different types of constraints.
3. Implementation of different types of Joins
 - a) Inner Join b) Outer Join c) Natural Join
4. Study and Implementation of
 - a) Group By & having clause b) Order by clause
5. Implementation of Views
6. Execute DCL and TCL Commands

PART B: PL/SQL

1. Create a library table with attributes book id, author_name, publisher, price and edition. Write PL/SQL code block to accept the publisher's name and count number of books under that publisher and display it. Also display the publisher with maximum publication.
2. Write a function to display employee name with distinct salaries
For eg.
if a 's salary is 100
b 's salary is 200
c 's salary is 100 display either (a or c) and b
3. Write a function to rank the employees based on their salary (use RANK function)
4. Write a function to validate the Employee email id.
5. Write a procedure to capture the error log in a table in case of an exception using

autonomous transaction, from employee table, store ename and salary in varrays and display the contents of the arrays in table format.

6. Write an Anonymous block which raise a user defined exception on Thursday?
7. Write a PL/SQL cursor program which is used to calculate total salary from emp table
8. without using sum () function?

Evaluation Scheme for Lab Examination

Assessment Criteria		Marks
Program -1 from Part A	Write up of the program -1	5
Program -2 from Part B	Write up of the program -2	5
Execution and formatting (Any one program)		10
Viva Voce based on Lab Activities		05
Total		25

Syllabus for Open Electives in Computer Science:

Course Code: CSOE-1	Course Title: Computer Fundamentals
Course Credits: 03	Hour of Teaching/Week: 03
Total Contact Hours: 42	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 03

Course Outcomes (COs):

After completing this course satisfactorily, a student will be able to:

- Introduction to computers, classification of computers, anatomy of computer, constituents and architecture, microcontrollers
- Operating systems, functions of operating systems, classification of operating systems, kernel, shell, basics of Unix, shell programming, booting
- Databases, why databases are used, users, SQL, data types in SQL, introduction of queries - select, alter, update, delete, truncate, using where, and or in not in
- Internet basics, features, applications, services, internet service providers, domain name system, browsing, email, searching
- Web Programming basics, introduction of HTML and CSS programming
- Introduction of computers, classification of computers, anatomy of computer, constituents and architecture, microcontrollers.

Course Content

Content	Hours
Unit - 1	
Fundamentals of Computers: Introduction to Computers - Computer Definition, Evolution and History of Computers, Basic Organisation of a Digital Computer; Number Systems – different types, conversion from one number system to another; Computer Codes – BCD, Gray Code, ASCII and Unicode; Boolean Algebra – Boolean Operators with Truth Tables; Types of Software – System Software and Utility Software; Computer Languages - Machine Level, Assembly Level & High Level Languages, Translator Programs – Assembler, Interpreter and Compiler; Planning a Computer Program - Algorithm, Flowchart and Pseudo code with Examples(at least 5 hours of teaching .	10
Unit-2	

Introduction to Computer: Characteristics of computers, Classification of Digital Computer Systems: Microcomputers, Minicomputers, Mainframes, Super computers. Anatomy of Computer: Introduction, Functions & Components of a Computer, Central Processing Unit, Storage units, Input and output Devices. How CPU and memory works. Program execution with illustrative examples. Introduction to microcontrollers.	10
Unit-3	
Operating System Fundamentals: Operating Systems: Introduction, Functions of an operating System, Classification of Operating Systems, System programs, Application programs, Utilities, The Unix Operating System, Basic Unix commands, Microkernel Based Operating System, Booting.	08
Unit-4	
Introduction to Database Management Systems: Database, DBMS, Why Database - File system vs DBMS, Database applications, Database users, Introduction to SQL, Data types, Classification of SQL-DDL with constraints, DML, DCL, TCL	08
Unit-5	
Internet Basics: Introduction, Features of Internet, Internet application, Services of Internet, Logical and physical addresses, Internet Service Providers, Domain Name System. Web Basics: Introduction to web, web browsers, http/https, URL, HTML5, CSS	06

Text Books:

1. Pradeep K. Sinha and Priti Sinha: Computer Fundamentals (Sixth Edition), BPB Publication
2. David Riley and Kenny Hunt, Computational thinking for modern solver, Chapman & Hall/CRC,

Reference:

1. J. Glenn Brook shear, " Computer Science: An Overview", Addison-Wesley, Twelfth Edition,
2. R.G. Dromey, "How to solve it by Computer", PHI,

Course Code: CSOE-2	Course Title: Problem Solving and C Programming Concepts
Course Credits: 03	Hours/Week: 03
Total Contact Hours: 42	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 03 Hours

Course Outcomes (COs):

After completing this course satisfactorily, a student will be able to:

1. Introduction to computers, classification of computers, anatomy of computer, constituents and architecture, microcontrollers
2. Operating systems, functions of operating systems, classification of operating systems, kernel, shell, basics of Unix, shell programming, booting
3. Databases, why databases are used, users, SQL, data types in SQL, introduction of queries - select, alter, update, delete, truncate, using where, and or in not in
4. Internet basics, features, applications, services, internet service providers, domain name system, browsing, email, searching
5. Web Programming basics, introduction of HTML and CSS programming
6. Introduction of computers, classification of computers, anatomy of computer, constituents and architecture, microcontrollers.

Course Content

Content	Hours
Unit – 1	
Problem Solving Techniques: Problem solving techniques – problem definition, analysis, design, debugging, testing, documentation and maintenance. Design Tools - ALGORITHM: definition, characteristics, advantages and disadvantages. FLOWCHART - definition, symbols, advantages and disadvantages. Writing an algorithm and flowchart: Area of circle, arithmetical operations, simple interest and compound interest, quadratic equation, largest of three numbers, sum of N natural numbers, factorial of number, Fibonacci series, prime number, reverse a given number, evaluation of series like $\sin(x)$, $\cos(x)$, e^x , $\log(x)$ etc.	10
Unit-2	

Introduction to C Programming: Overview of C; History and Features of C; Structure of a C Program with Examples; Creating and Executing a C Program; Compilation process in C. C Programming Basic Concepts: C Character Set; C tokens - keywords, identifiers, constants, and variables; Data types; Declaration & initialization of variables; Symbolic constants, Formatted I/O functions - printf and scanf,	10
Unit-3	
C Operators & Expressions: Arithmetic operators; Relational operators; Logical operators; Assignment operators; Increment & Decrement operators; Bitwise operators; Conditional operator; Special operators; Operator Precedence and Associativity; Evaluation of arithmetic expressions; Type conversion.	08
Unit-4	
Decision making, branching and looping: Decision making - if and if-else statement, nested if, else if ladder, switch statements, conditional operator, goto statement. Looping - while, do-while and for, nested for. break and continue statements. Programs on these concepts.	08
Unit-5	
Arrays: One Dimensional arrays - Declaration, Initialization and Memory representation; Two Dimensional arrays - Declaration, Initialization and Memory representation.	06

References:

1. Computer Concepts and Programming, Padma Reddy
2. Let us C , Yashwanth Kanetkar
3. Ansi C, Balagurusamy
4. Problem solving with C, M. T. Somashekara and D. S. Guru

Course Code: CSOE03	Course Title: Office Automation
Course Credits: 03	Hours/Week: 03
Total Contact Hours: 42	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 03 Hours

Course Content

Content	Hours
Unit – 1	
Windows Desk top - GUI: Definition, Standards, Cursors/Pointers, Icons, GUI Menus, GUI-Share Data – Desktop icons and their functions: My computer, My documents, Network neighbourhood, Recycle Bin, Quick launch tool bar, System tray, Start menu, Task bar – Dialog Boxes: List Box, Spin Control Box, Slide, Drop-down list, Radio button, Check box, Text box, Task Bar - System Tray - Quick launch tool bar - Start button - Parts of Windows -Title bar-Menu bar - Scroll bar-Status bar, Maximize, Minimize, close and Resize & Moving a Window – Windows - Start Menu –Help Menu- Preview Menu; Logoff & Shutdown – Keyboard Accelerators: Key board short keys or hotkeys	06
Unit-2	
MS Word - Working with Documents -Opening & Saving files, Editing text documents, Inserting, Deleting, Cut, Copy, Paste, Undo, Redo, Find, Search, Replace, Formatting page & setting Margins, Converting files to different formats, Importing & Exporting documents, Sending files to others, Using Tool bars, Ruler, Using Icons, using help, Formatting Documents - Setting Font styles, Font selection- style, size, colour etc, Type face - Bold, Italic, Underline, Case settings, Highlighting, Special symbols, Setting Paragraph style, Alignments, Indents, Line Space, Margins, Bullets & Numbering. Setting Page style - Formatting Page, Page tab, Margins, Layout settings, Paper tray, Border & Shading, Columns, Header & footer, Setting Footnotes & end notes – Shortcut Keys; Inserting manual page break, Column break and line break, creating sections & frames, Anchoring & Wrapping, Setting Document styles, Table of Contents, Index, Page Numbering, date & Time, Author etc., Creating Master Documents, Web page. Creating Tables- Table settings, Borders, Alignments, Insertion, deletion, Merging, Splitting,	10

Sorting, and Formula, Drawing - Inserting ClipArt, Pictures/Files etc., Tools – Word Completion, Spell Checks, Mail merge, Templates, Printing Documents – Shortcut keys.	
Unit-3	
MS Excel: Spread Sheet & its Applications, Opening Spreadsheet, Menus - main menu, Formula Editing, Formatting, Toolbars, Using Icons, Using help, Shortcuts, Spreadsheet types. Working with Spreadsheets- opening, saving files, setting Margins, converting files to different formats (importing, exporting, sending files to others), Spread sheet addressing - Rows, Columns & Cells, Referring Cells & Selecting Cells – Shortcut Keys. Entering & Deleting Data- Entering data, Cut, Copy, Paste, Undo, Redo, Filling Continuous rows, columns, highlighting values, Find, Search & replace, Inserting Data, Insert Cells, Column, rows & sheets, Symbols, Data from external files, Frames, Clipart, Pictures, Files etc, Inserting Functions, Manual breaks, Setting Formula - finding total in a column or row, Mathematical operations (Addition, Subtraction, Multiplication, Division, Exponentiation), Using other Formulae. Formatting Spreadsheets, Formatting layout for Graphics, Clipart etc., Worksheet Row & Column Headers, Sheet Name, Row height & Column width, Visibility - Row, Column, Sheet, Security, Sheet Formatting & style, Sheet background, Colour etc, Borders & Shading – Shortcut keys. Working with sheets – Sorting, Filtering, Validation, Consolidation, and Subtotal. Creating Charts - Drawing. Printing. Using Tools	10
Unit-4	
MS Power point: Introduction to presentation – Opening new presentation, Different presentation templates, Setting backgrounds, Selecting presentation layouts. Creating a presentation - Setting Presentation style, Adding text to the Presentation. Formatting a Presentation - Adding style, Colour, gradient fills, Arranging objects, Adding Header & Footer, Slide Background, Slide layout. Adding Graphics to the Presentation- Inserting pictures, movies, tables etc into presentation, Drawing Pictures using Draw. Adding Effects to the Presentation- Setting Animation & transition effect. Printing Handouts, Generating Standalone Presentation viewer.	10

Unit-5	
Internet and Web Browsers: Definition of Web Addressing-URL-Different types of Internet Connections; Dial up connection, Broad band (ISDN, DSL, Cable), Wireless (Wi-Fi, WiMax, Satellite, Mobile) naming convention, browsers and its types, internet browsing, searching - Search Engines - Portals - Social Networking sites- Blogs - viewing a webpage, downloading and uploading the website; Creating an email-ID, e-mail reading, saving, printing, forwarding and deleting the mails, checking the mails, viewing and running file attachments, addressing with cc and bcc.	06

References:

1. Fundamentals of computers - V.Rajaraman - Prentice- Hall of india
2. Microsoft Office 2007 Bible - John Walkenbach,Herb Tyson,Faihe Wempen,cary N.Prague,Michael R.groh,Peter G.Aitken, and Lisa a.Bucki -Wiley India pvt.ltd.
3. Computer Fundamentals - P. K. Sinha Publisher: BPB Publications.
4. Computer & Internet Basics Step-by-Step - Etc-end the Clutter - Infinity Publishing.
5. <https://en.wikipedia.org>
6. <http://windows.microsoft.com/en-in/windows/windows-basics-all-topics>

Open Elective

THIRD SEMESTER :

ELECTRONIC COMMERCE

Course Code: CSOE04	Course Title: E-Commerce
Course Credits: 03	Hours/Week: 03
Total Contact Hours: 42	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 03 Hours

Course Outcomes (COs):

- Compare how internet and other information technologies support business processes.
- Demonstrate an overall perspective of the importance of application of internet technologies in business administration
- Explain the basic business management concepts.
- Demonstrate the basic technical concepts relating to E-Commerce.
- Identify the security issues, threats and challenges of E-Commerce.

Content	Hours
Unit – 1	
Introduction to E-Commerce and Technology Infrastructure Working of Web - HTML Markup for Structure - Creating simple page - Marking up text - Adding Links - Adding Images - Table Markup - Forms – HTML	9
Unit-2	
Building an E-Commerce Website, Mobile Site and Apps: Systematic approach to build an E-Commerce: Planning, System Analysis, System Design, Building the system, Testing the system, Implementation and Maintenance, Optimize Web Performance – Choosing hardware and software – Other E-Commerce Site tools – Developing a Mobile Website and Mobile App	10
Unit-3	
E-Commerce Security and Payment Systems: E-Commerce Security Environment – Security threats in E-Commerce – Technology Solutions: Encryption, Securing Channels of Communication, Protecting Networks,	09

Protecting Servers and Clients – Management Policies, Business Procedure and Public Laws- Payment Systems	
Unit-4	
Business Concepts in E-Commerce: Digital Commerce Marketing and Advertising strategies and tools – Internet Marketing Technologies – Social Marketing – Mobile Marketing – Location based Marketing – Ethical, Social, Political Issues in E-Commerce	09
Unit-5	
Project Case Study: Case Study: Identify Key components, strategy, B2B, B2C Models of E-commerce Business model of any e-commerce website - Mini Project : Develop E-Commerce project in any one of Platforms like Woo-Commerce, Magento or OpenCart	05

Text Book:

1. Kenneth C. Laudon, Carol Guercio Traver - E-Commerce, Pearson, 10th Edition, 2016

References:

1. <http://docs.opencart.com/>
2. <http://devdocs.magento.com/>
3. <http://doc.prestashop.com/display/PS15/Developer+tutorials>
4. Robbert Ravensbergen, –Building E-Commerce Solutions with Woo Commerce||,PACKT, 2nd Edition

WEB DESIGNING

Course Code: CSOE05	Course Title: Web Designing
Course Credits: 03	Hours/Week: 03
Total Contact Hours: 42	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 03 Hours

Course Outcomes (COs):

- Students can understand the basics of internet technology.
- Demonstrate the various tags useful to create a web page.
- Write HTML and understand how to effectively implement it in the web environment.
- Write CSS effectively to create well organized, styled web pages.

Content	Hours
Unit – 1	
Internet Basics: Basic concepts, communicating on the Internet, Internet Domains, Internet server identities – Registering a virtual domain with inter NIC, Domain Name Extension, establishing connectivity on the internet, Client IP Address – How Client IP Address are assigned, How ISPs achieve the task of assigning IP Address, How IP Address came into existence, A brief overview of TCP/IP and its services – Internet Protocol, Transmission control protocol – world wide web, FTP, Telnet.	08
Unit-2	
Introduction to HTML - Information files creation, Web server, Web browser – understanding how a browser communicates with a web server, establish connection, Client issues a request and sends a response, server terminates the connection.	10
Unit-3	
HTML: HTML tags, Paired tags, Singular tags, Structure of HTML program – Head, Body, Title and footers, Text Formatting tags – Paragraph breaks, line breaks, Head styles, Drawing Lines, Text Styles – Bold, Italic, Underline, Centering (Text, Images., etc). Lists: Types of Lists: Unordered list (Bullets), Ordered list (Numbering), Definition list Adding Graphics to HTML document: Using the border attribute, width and height attribute, align attribute, alt attribute. Tables: Introduction, the caption tag, Using the width and border attribute, cellpadding attribute, cellspacing attribute, the background-color property, the colspan and Rowspan attribute.	08

Unit-4	
Linking Documents: External document references, Internal document references, hyper linking to a HTML FILE, Images as Hyperlinks. Frames: Introduction to frames- frameset tag, frame tag	08
Unit-5	
Dynamic HTML(DHTML): CSS (Cascading Style Sheets) – Font attributes, color and background attributes, Text attribute, Border attribute, Margin attributes, List attribute, Using the span and div tags, External Style Sheets.	08

Text Book:

- 1.HTML, JavaScript, DHTML and PHP – Ivan Bayross 4th edition

References:

- 1.<https://www.w3schools.com/TAg/default.asp>
- 2.<https://w3schools.sinsixx.com/dhtml/>
- 3.Web Design With HTML & CSS: HTML & CSS Complete Beginner's Guide – Prem Kumar

Pattern of continuous Evaluation and Semester End Examination

Total Marks for each course = 100

Continuous assessment (C1) = 20 marks

Continuous assessment (C2) = 20 marks

Semester End Examination (C3) = 60 marks

i. Formative evaluation process (Internal Assessment).

a. The first component (C1) of assessment is for 20 marks. This shall be based on tests, assignments, seminars, case studies, fieldwork, project work etc. This assessment and score process should be completed after completing 50% of the syllabus of the course/s and within 45 working days of the semester program.

b. The second component (C2) of assessment is for 20 marks. This shall be based on the test, assignment, seminar, case study, fieldwork, internship / industrial practicum/project work etc. This assessment and score process should be based on the completion of the remaining 50 per cent of the syllabus of the courses of the semester.

Summative evaluation process (Semester End theory Examination).

During the 17th – 19th week of the semester, a semester-end examination shall be conducted by the University for each course. This forms the third and final component of assessment (C3) and the maximum marks for the final component will be 60 marks.

Practical Examination: For the practical course of full credits, marks shall be for 50 marks awarded as follows

Internal Assessment for 25 Marks: 15 Marks for maintaining Practical record and 10 marks for practical test. Test shall be conducted after the completion of Practical Classes.

End Semester Practical Examination: End Semester Practical examination shall be conducted for 25 marks.

**QUESTION PAPER PATTERN FOR DEGREE COURSES
(DSC, OE and Languages)**

First Semester Degree Examination, April/May 2022

(CBCS NEP Scheme)

Paper: DSC/OE/Languages

Time: 02 Hours

Max. Marks: 60

I. Select the most appropriate answer from the options provided: 10 x 1 = 10

1).....

a) b) c) d)

2).....

a) b) c) d)

.

.

.

10).....

a) b) c) d)

II. Answer/Write short notes on any **FIVE** of the following: 05 x 03 = 15

1)

2)

3)

4)

5)

6)

7)

8)

III. Answer any **THREE** questions from the following: 03 x 05 = 15

1)

2)

3)

4)

5)

IV. Answer the following* 02 x 10 = 20

1) -----

OR

2) -----

OR

*May have sub questions if required

Syllabus Distribution for Question Paper Setting

Section-I	Ten Questions of each carrying 02 marks	Two questions from each unit
Section -II	Eight Questions of each carrying 03 marks	At least one question from each unit and remaining questions from those units with higher teaching hours
Section -III	Five Questions of each carrying 05 marks	At least one question from each unit.
Section -IV	Four Questions of each carrying 10 marks	First question from unit-1 or Second question from unit-2 ----- Third question from unit-3 or Fourth question from unit-4 &unit-5



NEP-2020

**CURRICULUM STRUCTURE AND SYLLABUS OF
SKILL ENHANCEMENT COURSE (SEC) FOR ALL UG PROGRAMMES
(EXCEPT BCA PROGRAMME)**

UG BOS IN COMPUTER SCIENCE

w.e.f Academic Year 2022-23 onwards

SEC FOR FIRST/SECOND SEMESTER
Syllabus for Digital Fluency

The Institution can select any one model among the below two models

Digital Fluency - Model 1

Course Title: Digital Fluency	Course Credits: 2
Total Contact Hours: 15 hours + 30 hours practical demonstration in classroom	Duration of Exam: 01 hour
Formative Assessment Marks: 40 marks	Summative Assessment Marks: 60 marks

Course Content: In concurrence with Digital Fluency 101 on NASSCOM 101 environment

Sl.no	Content	Details of topic	Duration
1.	Registration	Future Skills Course Registration Process	
2.	Module 1: Emerging Technologies	Overview of Emerging Technologies: i. Artificial Intelligence, Machine Learning, Deep Learning, ii. Database Management for Data Science, Big Data Analytics, iii. Internet of Things (IoT) and Industrial Internet of Things (IIoT) iv. Cloud computing and its service models v. Cyber Security and Types of cyber attack	05 Theory hours and 10 practical hours
3.	Module 2: Applications of Emerging Technologies	Applications of emerging technologies: i. Artificial Intelligence ii. Big Data Analytics iii. Internet of Things iv. Cloud Computing v. Cyber Security	05 Theory hours and 10 practical hours
4.	Module 3: Building Essential Skills Beyond Technology	Importance of the following: i. Effective Communication Skills ii. Creative Problem Solving & Critical Thinking iii. Collaboration and Teamwork Skills iv. Innovation & Design Thinking v. Use of tools in enhancing skills	05 Theory hours and 10 practical hours

References to learning resources:

1. The learning resources made available for the course titled “Digital 101” on Future Skills Prime Platform of NASSCOM

Pedagogy

1. Flipped classroom pedagogy is recommended for the delivery of this course. For every class:
2. Before coming to the class students are expected to go through the content (both video and other resources) on the related topic and give the quiz on Future Skills Prime Platform of NASSCOM.
3. Class room activities are designed around the topic of the session towards developing better understanding, clearing misconceptions and discussions of higher order thinking skills like application, analysis, evaluation and design.
4. Every theory class ends with announcement of exercise for practical activity of the week

Assessment

Formative Assessment	
Assessment Occasion	Weightage in Marks
1. After watching videos of each topic, 05 marks tests are to be given by the students on Future Skills Prime Platform. The total marks earned by students is to be computed.	No weightage
2. Formative Assessment (Internal Assessment): All activities and Practical sessions from Module 1, Module 2 and Module 3 need be completed by students. All the activities are expected to be done in teams with each team comprising of 02 -03 students. Each of Module 1 and Module 2 carry 15 marks weightage and Module 3 carries 10 marks weightage.	40%
Summative Assessment	
University will conduct examination which carries 60 marks weightage.	60%
In addition, after completion of all 3 modules students will be giving final assessment with 30 questions (30 min) on Digital course on Future Skills Prime platform. Students will have maximum of two attempts and those who score at least 50% marks will get certificate from NASSCOM.	

Digital Fluency- Model 2

Course Code: SEC-1	Course Title: Digital Fluency	
Course Credits: 02	Hours/Week: Theory -01 hour + 02 hours practical demonstration in classroom	
Total Contact Hours: 45 Theory -15 hours + 30 hours practical demonstration in classroom	Formative Assessment Marks: 25	
Summative Assessments Marks: 25	Exam Duration: 01 hr.	
Content		Hours
Unit - I		
Operating Systems: types of operating systems, major functions of the operating systems, types of user interface, examples of operating systems: MS-DOS, Windows, Mac OS, Linux, Solaris, Android. Office automation tools: word processor, power point, and spread sheet.		5
Unit - II		
Introduction to Computer Networks: Evolution of Networking, types of networks, Network devices - Modem, ethernet card, RJ45, Repeater, Hub, Switch, Router, and Gateways, Identification of Nodes in a Networked Communication, Internet, Web and the Internet of Things, Domain Name Systems. Security Aspects - Threats and Prevention, Malware - virus, Worms, Ransomware, Trojan, spyware, adware, key loggers, Modes of Malware distribution, Antivirus, HTTP vs HTTPS, Firewall, Cookies, Hackers and Crackers		5
Unit - III		
Database Management Systems: Relational Data Model. Introduction to e-learning platforms such as Swayam, and MOOC. Virtual Meet: Technical Requirements, Scheduling a meeting, joining virtual meet, recording the meeting, Online Forms: Creating questionnaire, Publishing Questionnaire, conducting online responses, Analysing the responses, copying graphics into PowerPoint, Downloading the response to spreadsheet. Introduction to societal impacts, Digital Foot prints, Digital Society and Netizen, Data Protection, E-waste, Impact on Health.		5
Laboratories Activities: Identifying the configuration of a computer system, laptop, and a mobile phone,		30

Identifying the version and the configuration of the operating system of a computer, laptop, and a mobile phone, Identifying the network components like patch cord, switch, RJ 45 Jack, Socket, and wireless router, creating a hotspot from a mobile phone, and allowing others to use the hotspot, creating a Google form, and send it to five users, scheduling a Google meet and invite three people to join the Google meet, record the Google Meet, Creating an account in the railway reservation website, IRCTC, and finding trains from Tumkur to Hubli, creating a one minute video of your choice in your native tongue, and upload the video to YouTube.	
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Web Resources:

1. Operating Systems - https://ftms.edu.my/v2/wp-content/uploads/2019/02/csca0101_ch06.pdf
2. Database Concepts - <https://ncert.nic.in/textbook/pdf/keip107.pdf>
3. Computer Networks - <https://ncert.nic.in/textbook/pdf/lacs110.pdf>
4. Security Aspects - <https://ncert.nic.in/textbook/pdf/lacs112.pdf>
5. Offences and Penalties Under IT Act 2000 - <https://taxguru.in/corporate-law/offences-penaltiesinformation-technology-act-2000.html>
6. Societal Impact - <https://ncert.nic.in/textbook/pdf/leip106.pdf>
7. Google Meet Tutorial - <https://edvance.hawaii.hawaii.edu/wp-content/uploads/Google-Meet-Tutorial-Getting-Started-and-Recording-a-Lecture.pdf>
8. [Tutorial-Getting-Started-and-Recording-a-Lecture.pdf](https://edvance.hawaii.hawaii.edu/wp-content/uploads/Google-Meet-Tutorial-Getting-Started-and-Recording-a-Lecture.pdf)
9. Google Forms - https://pdst.ie/sites/default/files/Google%20Drive_1.pdf

SEC FOR THIRD/FOURTH SEMESTER Syllabus for Artificial Intelligence

The Institution can select any one model among the below two models

Artificial Intelligence-Model 1

Course Code: SEC-2	Course Title: Artificial Intelligence
Course Credits: 02	Hours/Week: Theory -01 hour + 02 hours practical demonstration in classroom
Total Contact Hours: 45 Theory -15 hours + 30 hours practical demonstration in classroom	Formative Assessment Marks: 25
Summative Assessments Marks: 25	Exam Duration: 01 hr.

Course Outcomes (COs):

At the end of the course, students will be able to:

- Appraise the theory of Artificial intelligence and list the significance of AI.
- Discuss the various components that are involved in solving an AI problem.
- Illustrate the working of AI Algorithms in the given contrast.
- Analyze the various knowledge representation schemes, Reasoning and Learning techniques of AI.
- Apply the AI concepts to build an expert system to solve the real-world problems.

Course Content

Unit - 1	
Overview of AI: Definition of Artificial Intelligence, Philosophy of AI, Goals of AI, Elements of AI system, Programming a computer without and with AI, AI Techniques, History of AI. Intelligent Systems: Definition and understanding of Intelligence, Types of Intelligence, Human Intelligence vs Machine Intelligence.	05
Unit – 2	
AI Applications: Virtual assistance, Travel and Navigation, Education and Healthcare, Optical character recognition, E-commerce and mobile payment systems, Image based search and photo editing. AI Examples in daily life: Installation of AI apps and instructions to use AI apps.	05
Unit – 3	
Robotics: Introduction to Robotics, Difference in Robot System and Other AI Program, Components of a Robot.	05

Laboratory Activities:

- **Amazon Alexa:**
<https://play.google.com/store/apps/details?id=com.amazon.dee.app&hl=en&gl=US>
- **Google Lens:**
<https://play.google.com/store/search?q=google+lens&c=apps&hl=en&gl=US>
- **Image to Text to Speech ML OCR:**
https://play.google.com/store/apps/details?id=com.mlscanner.image.text.speech&hl=en_IN&gl=US
- **Google Pay:**
https://play.google.com/store/apps/details?id=com.google.android.apps.nbu.paisa.user&hl=en_IN&gl=US
- ☑ Grammarly:
https://play.google.com/store/search?q=grammarly&c=apps&hl=en_IN&gl=US
- ☑ Google Map:
<https://play.google.com/store/search?q=google+maps&c=apps&hl=en&gl=US>
- ☑ FaceApp:
https://play.google.com/store/apps/details?id=io.faceapp&hl=en_IN&gl=US
- ☑ Socratic:
https://play.google.com/store/apps/details?id=com.google.socratic&hl=en_IN&gl=US
- ☑ Google Fit: Activity Tracking:
https://play.google.com/store/apps/details?id=com.google.android.apps.fitness&hl=en_IN&gl=US
- ☑ SwiftKey Keyboard:
<https://swiftkey-keyboard.en.uptodown.com/android>
- ☑ E-commerce App:
https://play.google.com/store/apps/details?id=com.jpl.jiomart&hl=en_IN&gl=US

30

Text Books:

1. Wolfgang Ertel, "Introduction to Artificial Intelligence", 2nd Edition, Springer International Publishing 2017.
2. Michael Negnevitsky, "Artificial Intelligence A Guide to Intelligent Systems", 2nd Edition, Pearson Education Limited 2005.

References:

1. https://www.tutorialspoint.com/artificial_intelligence/artificial_intelligence_tutorial.pdf
2. Kevin Knight, Elaine Rich, Shivashankar B. Nair, "Artificial Intelligence", 3rd Edition, July 2017.

Reference Links:

1. Voice Assistant: <https://alan.app/blog/voiceassistant-2/>
2. Browse with image: <https://www.pocket-lint.com/apps/news/google/141075-what-is-google-lens-and-how-does-it-work-and-which-devices-have-it>
3. OCR: <https://aws.amazon.com/what-is/ocr/>
4. Mobile Payment system: <https://gocardless.com/en-us/guides/posts/how-do-mobile-payment-systems-work/>
5. Grammarly: <https://techjury.net/blog/how-to-use-grammarly/#gref>
6. Travel & Navigation: <https://blog.google/products/maps/google-maps-101-ai-power-new-features-io-2021/>
7. AI in photo editing: <https://digital-photography-school.com/artificial-intelligence-changed-photo-editing/>
8. AI in education: <https://www.makeuseof.com/what-is-google-socratic-how-does-it-work/>
9. AI in health and fitness: <https://cubettech.com/resources/blog/implementing-machine-learning-and-ai-in-health-and-fitness/>
10. E-commerce and online shopping: <https://medium.com/@nyxonedigital/importance-of-e-commerce-and-online-shopping-and-why-to-sell-online-5a3fd8e6f416>

Artificial Intelligence-Model 2

Course Title: Artificial Intelligence	Course Credits: 2
Total Contact Hours: 15 hours of theory and 30 hours of practical demonstration in classroom	Duration of Exam: 01 Hour
Formative Assessment Marks: 25 marks	Summative Assessment Marks: 25 marks

Course Outcomes (COs):

- At the end of the course, students will be able to:
- Appraise the theory of Artificial intelligence and list the significance of AI.
- Discuss the various components that are involved in solving an AI problem.
- Illustrate the working of AI Algorithms in the given contrast.
- Analyze the various knowledge representation schemes, Reasoning and Learning techniques of AI.
- Apply the AI concepts to build an expert system to solve the real-world problems.
-

Course Content (Artificial Intelligence)

	Details of topic	Duration
Course – 1 - Azure AI Fundamentals (AI-900)	AI-900 pathway consists of 5 courses and 2 reading material: Introduction to AI on Azure Use visual tools to create machine learning models with Azure Machine Learning Explore computer vision in Microsoft Azure Explore natural language processing Explore conversational AI Tune Model Hyperparameters - Azure Machine Learning (Reading) Neural Network Regression: Module Reference - Azure Machine Learning (Reading)	07 hours
Practical	Prepare the data Model the data Visualize the data Analyse the data Deploy and maintain deliverables	15 hours

Course – 2 - Data Analyst Associate (DA- 100)	DA-100 pathway consists of 5 courses and 2 reading material: Get started with Microsoft data analytics Prepare data for analysis Model data in Power BI Visualize data in Power BI Data analysis in Power BI Manage workspaces and datasets in Power BI Key Influencers Visualizations Tutorial - Power BI Smart Narratives Tutorial - Power BI Microsoft Docs	08 hours
Practical	Describe Artificial Intelligence workloads and considerations Describe fundamental principles of machine learning on Azure Describe features of computer vision workloads on Azure Describe features of Natural Language Processing (NLP) workloads on Azure	15 hours

References to learning resources:

1. The learning resources made available for the course titled “Azure AI Fundamentals(AI-900) and Data Analyst Associate (DA-100).” on Future Skills Prime Platform ofNASSCOM.

Pedagogy

Flipped classroom pedagogy is recommended for the delivery of this course.For every class:

1. All the faculty who takes this class should go for a Faculty Development Program onthese before starting the session.
2. Faculty needs to introduce this course to the students then students need to startlearning from Future Skills PRIME platform.
3. Faculty also needs to explain the course outcomes and needs of the course and why itis needed for the students.
4. Then students need to start learning online after registering on the platform.
5. Classroom activities are designed around the topic of the session towards developing better understanding, clearing doubts and discussions of high order thinking skills likeapplication, analysis, evaluation, and design.
6. Every theory class ends with announcement of exercise for practical activity of theweek.

Exercises:

Practical Exercises	Weightage in marks
After each chapter students' needs to complete exercises based on the learning in Azure environment.	No Weightage (But students need to complete it to move to next chapter) .

Assessment:

Formative Assessment	
Assessment Occasion	Weightage in Marks
1. Summative Assessment: After completion of both the courses, the student can optionally give Assessment for each of the courses on Future Skills Prime platform. Students will have two attempts and those who score at least 50% marks per course will get certificate from NASSCOM-MeitY.	This assessment may be given 50% weight in computing the final grade of the students.

Who can teach this course:

1. Faculties of Dept. of Computer Science/BCA are eligible for teaching/Paper setting/evaluation of the Skill enhancement course.
2. If the Dept. of Computer Science/BCA is not existed in a college, then any faculties with qualification of M.Sc/M.Tech. (Computer Science/Information Science) OR MCA are eligible to teach.

Evaluation Method

1. The evaluation method is based on descriptive question paper, the questions shall be in both English and Kannada, the students can answer in any one medium.
2. There shall not be any explicit practical examination. However, while evaluating students for formative (continuous) assessment, the practical component shall be considered.
3. A. Formative evaluation process (Internal Assessment) - 25 Marks.

Activities	C1	C2	Total Marks
Session Test	10 Marks	-	10 Marks
Presentation /Assignment /Practical test /Project work	--	15 marks	15 marks
Total	10 Marks	15 marks	25 marks

B. summative evaluation Process (Semester End theory Examination) : 25 marks

There shall be a semester-end examination conducted by the university. This forms the third and final component of assessment(C3) and the maximum marks for the final component will be 25 marks.

Question paper pattern for Skill Enhancement Course (SEC)

Time 01 hour

Max. marks 25

Section A

1 Multiple choice questions. select the most appropriate answer from the options provided:

1x5=5

i.....

a b. c. d

ii.....

a b. c. d

iii.....

a b. c. d

iv.....

a b. c. d

v.....

a b. c. d

Section B

Answer any TWO questions from the following

2x5=10

2.

3.

4.

5

Section C

Answer any ONE questions from the following

01x10=10

6.

7.

8.

KUVEMPU UNIVERSITY

**BOARD OF STUDIES (BOS) IN ELECTRONICS
(UNDER GRADUATE PROGRAMME)**

APPROVED SYLLABUS

(To be effective from the academic year 2021-22)

For

I AND II SEMESTER ELECTRONICS PAPERS

of

B.Sc./B.Sc.(HONS.) DEGREE PROGRAMME

[Framed in according with the National Education policy (NEP-2020)

&Based on *Model Electronics Syllabus* prepared by Electronics expert committee,

Karnataka State Higher Education Council, Bangalore]

Syllabus approved in the Board of Studies (BOS) meeting held on 23rd September 2021 at the

Department of Post-Graduate in Physics and Research, Jnana Sahyadri, Shankaraghatta

CONTENTS

Sl No.	Description	Page No
2	Appendix-1: course pattern and scheme of examination for B.Sc. as per NEP 2020, Internal Assessment Marks	1
3	B.Sc. Degree formative and summative assessments	4
	Syllabus for I semester	
5	ELE-CT 1: Electronic Devices and Circuits	5
6	ELE-CP 1: Electronic Devices and Circuits Lab	9
7	ELE-OE1.1: Renewable Energy and Energy Harvesting	11
8	ELE-OE1.2: Basics of Electronics, Computers and PCB Design	13
	Syllabus for II semester	
9	ELE-CT 2: Analog and Digital Electronics	15
10	ELE-CP 2: Analog and Digital Electronics Lab	18
11	ELE-OE 2.1: Electronics for Everyone	19
12	ELE-OE 2.2: Mobile Communication	22

**APPENDIX-1: COURSE PATTERN AND SCHEME OF EXAMINATION for
B.Sc./B.Sc. (Hons.) as per NEP (2021-22 and onwards)**

SUBJECT: ELECTRONICS

SIN	Semester	Title of the Paper	Teaching Hours	Hours / Week		Examination Pattern Max. Marks/Paper				Duration of Exam (hours)		Total Marks / paper	Theory Credits	Practical Credits
				Theory	Practical	Theory		Practical		Theory	Practical			
						Exam	IA	Exam	IA					
1	I	ELE-CT 1: Electronic Devices and Circuits	60	4	4	60	40	25	25	3	4	150	4	2
		ELE-OE1.1/1.2	30	2	1**	40	10	-	-	3*	-	50	2	
2	II	ELE-CT2: Analog and Digital Electronics	60	4	4	60	30	25	25	3	4	150	4	2
		ELE-OE2.1/2.2	30	2	1**	40	10	-	-	3*	-	50	2	

***Questions from practical have to be included in theory examinations of Open Electives (Since electronics is a practical oriented subject)**

**** Tutorial Class**

Basis for Awarding Theory Internal Assessment Marks:

SIN	Particulars	IA Marks
1	Minimum of Two internal Tests	20
2	Assignments/Seminar/Case Study/Project work/Reports on-visits to industries/exhibitions/science center's/active participation in Electronics competitions, etc.	20
TOTAL Theory IA Marks		30

Basis for Awarding Practical Internal Assessment Marks:

SIN	Particulars	IA Marks
1	Practical Test	10
2	Report on data sheet of electronic devices/Seminar on electronics experiments, etc.	10
3	Active participation in practical classes	05
TOTAL Practical IA Marks		25

B.Sc. DEGREE FORMATIVE AND SUMMATIVE ASSESSMENTS
(Under New syllabus of NEP-2020 Scheme; Effective from Academic Year 2021-22)

SEMESTER: I/II

CORE COURSE and PAPER: ELECTRONICS – I/II

1. FORMATIVE ASSESSMENT (Max. Marks = 30)		
ASSESSMENT TYPE	DETAILS/METHOD	MARKS
Test	Theory paper IA tests	20 (Average of Two tests)
Assignments/Seminar/Case Study/Project work/Reports on visits to industries/exhibitions/science centre's/active participation in Electronics competitions, etc.		20
TOTAL Theory IA Marks		40
2. SUMMATIVE ASSESSMENT (End Semester Examination)		
A. Theory Examination (Max. Marks = 70; Duration -3 Hrs)		
Question Paper Pattern		
(There are <u>THREE</u> sections A, B and C. Each Section has <u>EIGHT</u> main questions out of which <u>FIVE</u> main questions are to be answered)		
Section – A (Short Answer questions)		
<ul style="list-style-type: none"> • • Each question carries 2 marks Max. Marks = 2 x 5 = 10 Marks. 		
Section – B (Medium Length Answer questions)		
<ul style="list-style-type: none"> • Each question carries 4 marks • Max. Marks = 4 x 5 = 20 Marks 		
Section – C (Long Answer questions)		
<ul style="list-style-type: none"> • Each question carries 6 marks • Max. Marks = 6 x 5 = 30 Marks 		

APPENDIX- 2: Syllabus

Semester-I

ELE-CT1: ELECTRONIC DEVICES AND CIRCUITS

(Credits: Theory–04, Practical–02)

Total Teaching hours:60

Course Objectives

Upon completing the course, ELE-CT1, the student will be able to understand various fundamental principles of network analysis, number systems and Boolean algebra and become familiar with the basic operation of electronic devices and circuits which are the building blocks of all electronic circuits, devices and gadgets.

UNIT-1

15 HOURS

Electronic Components: Electronic passive and active components, types and their properties, Concept of Voltage and Current Sources, electric energy and power. (Qualitative only)

Network Theorems: Superposition, Thevenin's, Norton's, Maximum Power Transfer, DC and AC analysis of RC and RL circuits, RLC series and parallel Resonant Circuits.

PN junction diode: Ideal and practical diodes, Formation of Depletion Layer, Diode Equation and I-V characteristics. Idea of static and dynamic resistance, Zener diode, Reverse saturation current, Zener and avalanche breakdown.

Rectifiers- Half wave and Full wave (center tap and bridge) rectifiers, expressions for output voltage, ripple factor and efficiency (mention only), Shunt capacitor filter. (Numerical examples wherever applicable).

UNIT-2

15 HOURS

Voltage regulator: Block diagram of regulated power supply, Line and Load regulation, Zener diode as voltage regulator– circuit diagram, load and line regulation, disadvantages. Clippers (shunt type) and clampers (Qualitative analysis only).

Bipolar Junction Transistor: Construction, types, CE, CB and CC configurations (mention only), VI characteristics of a transistor in CE mode, Regions of operation (active, cut off and saturation), leakage currents (mention only), Current gains α , β and y and their inter-relations, dc load line and Q point. Applications of transistor as amplifier and switch circuit and working. (Numerical examples wherever applicable).

UNIT-3

15 HOURS

Transistor biasing and Stabilization circuits- Fixed Bias and Voltage Divider Bias. Thermal run away, stability and stability factor. Transistor as a two-port network, h-parameter equivalent circuit.

Amplifier: Class A, B and C Amplifiers (qualitative). Types of coupling, two stage RC Coupled Amplifier–circuit, working and its Frequency Response, loading effect, GBW product, Darlington transistor.

UNIT-4

15HOURS

Boolean Algebra: Constants, variables, operators, basic logic gates-AND, OR, NOT, Positive and negative logic, Boolean laws, Duality Theorem, De Morgan's Theorem, simplification of Boolean expressions-SOP and POS. Derived logic gates (NAND, NOR, XOR & XNOR). Universal property of NOR and NAND gates. (Numerical examples wherever applicable).

Course Outcomes

At the end of this course, students will be able to

- Study and analyze basic networks using network theorems in a systematic manner.
- Build simple electronic circuits used in various applications.
- Describe the behavior of basic semiconductor devices.
- Reproduce the I-V characteristics of diode/BJT devices.
- Describe the frequency response of BJT amplifiers.
- Explain the behavior, characteristics and applications of Varactor diode, Schottky diode, Tunnel diode, LED, LCD and solar cells.
- Apply standard device models to explain/calculate critical internal parameters of semiconductor devices.
- Understand and represent numbers in powers of base and converting one from the other, carry out simple arithmetic operations.
- Understand the basic knowledge of Digital system building blocks, effectively can construct simple digital designs with the knowledge of Boolean algebra.

Reference Books:

1. Robert L Boylestad, "Introductory circuit analysis", 5th edition., Universal Book 2003.
2. R.S.Sedha, "A Textbook of Applied Electronics", 7th edition., S.Chand and Company Ltd.2011
3. A.P.Malvino, "Principles of Electronics", 7th edition.TMH, 2011.
4. Electronic devices and circuit theory by Boylestad, Robert Nashelsky
5. David A. Bell "Electronic Devices and Circuits", 5th Edition, Oxford Uni.Press,2015
6. Thomas L. Floyd, Digital Fundamentals, Pearson Education Asia(1994)
7. Digital Principles and Applications, A.P. Malvino, D.P.Leach and Saha,7thEd., 2011, Tata McGraw
8. Fundamentals of Digital Circuits, Anand Kumar, 2nd Edn, 2009, PHIL earning Pvt. Ltd.
9. Digital Circuits and systems, Venugopal, 2011, Tata McGrawHill.
- 10.Digital Systems: Principles & Applications, R.J.Tocci, N.S.Widmer, 2001,PHI Learning.
- 11.M. Nahvi& J. Edminister, "Electrical Circuits", Schaum's Outline Series TMGH 2005
- 12.S. A. Nasar," Electrical Circuits", Schaum's outline series, Tata McGraw Hill,2004
- 13.J. Millman and C. C. Halkias, "Integrated Electronics", Tata McGraw Hill,2001
- 14.A.S.Sedra,K.C. Smith,A.N. Chandorkar "Microelectroniccircuits", 6thEdn., Oxford University Press, 2014
15. J.J.Cathey, "2000 Solved Problems in Electronics", Schaum's outline Series, TMG1991

ELE-CP1: Electronic Devices and Circuits–Lab
(Hardware and Circuit Simulation Software)

Minimum of TEN Experiments to be performed excluding demonstration experiments

1. Verification of Thevenin's and Maximum Power Transfer Theorem.
2. Verification of Superposition Theorem.
3. Study of the I-V Characteristics of (a)p-n junction Diode, and(b)Zener diode.
4. Study of the I-V Characteristics of LED softwood different colors and 7-segmentdisplay.
5. Study of Half wave rectifier without and with shunt capacitor filter–ripple factor for different values of filter capacitors.
6. Study of full wave bridge rectifier without and with shunt capacitorfilter–ripple factor for different values of filter capacitors.
7. Study of Zener diode as a Voltage Regulator using bridge rectifier with shunt capacitor filter [Load and line regulation].
8. Study of Clipping, Clamping and Voltage Multiplier circuits.
9. Study of Transistor characteristics in CE configuration– determination of h-parameters.
- 10.Study of single stage CE amplifier (frequency response, input andoutput impedances in mid-band)
- 11.Study of two- stage RC-coupled CE amplifier (A_{V1} , A_{V2} , A_V) at mid-band frequency.
12. Study of Series and Parallel Resonance circuits–determination of its
 - (a) Resonant frequency
 - (b) Impedance at resonance
 - (c) Bandwidth

(d) Quality Factor

- 13.** Verification of truth tables of OR, AND, NOT, NAND, NOR, XOR and XNOR gates using respective ICs. Realization of XOR and XNOR using basic gates.
- 14.** Universal property of NAND and NOR gates

ELE-OE1.1: Renewable Energy and Energy Harvesting

(Credits: Theory–02, Tutorial–01)

Total Teaching hours:30

Unit-1

15Hours

Fossil fuels and Alternate Sources of energy: Fossil fuels and nuclear energy, their limitation, need of renewable energy, non-conventional energy sources. An over view of developments in Offshore Wind Energy, Tidal Energy, Wave energy systems, Ocean Thermal Energy Conversion, solar energy, biomass, biochemical conversion, biogas generation, geothermal energy tidal energy, Hydroelectricity.

Solar energy: Solar energy, its importance, storage of solar energy, solar pond, non-convective solar pond, applications of solar pond and solar energy, solar water heater, flat plate collector, solar distillation, solar cooker, solar green houses, solar cell, absorption air conditioning. Need and characteristics of photovoltaic (PV) systems, PV models, equivalent circuits, and sun tracking systems.

Wind Energy harvesting: Fundamentals of Wind energy, Wind Turbines and different electrical machines in wind turbines, Power electronic interfaces, and grid interconnection topologies.

Unit – 2

15 Hours

Ocean Energy: Ocean Energy Potential against Wind and Solar, Wave Characteristics, and Statistics, Wave Energy Devices. Tide characteristics and Statistics, Tide Energy Technologies, Ocean Thermal Energy, Osmotic Power, Ocean Bio-mass.

Geothermal Energy: Geothermal Resources, Geothermal Technologies.

Hydro Energy: Hydro power resources, hydro power technologies, environmental impact of hydro power sources. ***Piezoelectric Energy harvesting:*** Introduction, Physics and characteristics of piezoelectric effect, materials and mathematical description of piezoelectricity, Piezoelectric parameters and modeling piezoelectric generators, Piezoelectric energy harvesting applications, Human power. ***Electromagnetic Energy Harvesting:*** Linear generators, physics mathematical models, recent applications, Carbon captured technologies, cell, batteries, power consumption, Environmental issues and Renewable sources of energy, sustainability.

Demonstration Experiments:

30 Hours

1. Demonstration of training modules on solar energy, wind energy etc.
2. Conversion of vibration to voltage using piezoelectric voltages
3. Conversion of thermal energy into voltage using thermoelectric module.

Reference Books:

1. Non-conventional energy sources, B.H.Khan, McGraw Hill.
2. Solar energy, Suhas P Sukhative, Tata McGraw- Hill Publishing Company Ltd.
3. Renewable Energy, Power for a sustainable future, Godfrey Boyle, Oxford University Press.
4. Renewable Energy Sources and Emerging Technologies, Kothari et.al., PHI Learning.
5. Solar Energy: Resource Assessment Handbook, P Jayakumar.
6. J.Balfour, M.Shaw and S.Jarosek, Photovoltaics, Lawrence J Goodrich(USA).
7. http://en.wikipedia.org/wiki/Renewable_energy

ELE-OE1.2: Basics of Electronics, Computers and PCB Design
(Credits: Theory–02, Tutorial–01) TotalTeachinghours:30

Unit-1

15 Hours

Generation of and distribution of electricity: Mention of hydro electric generator, diesel generator, thermal generator, wind power, solar, ocean waves. Generation of DC power–Mention of batteries. Single phase, two phase and three phase. Transformers. Power transmission and distribution. Domestic electrical wiring–connection from AC line to the meter, sockets, mention of phase neutral and the need of earthing. Mention of electric shock and safety. Mention of power type (ac or dc) and current ratings for home appliances. Mention of tester. Electric motor working principle.

Computer fundamentals: History of computer system, block diagram of a computer system- functions of each units (Input, Output, Memory and CPU), Mention of various input and output devices, Memories - registers, primary memory, secondary memory, cache memory, Software - system software (operating system, program language translators-assembler, interpreter and compiler), utility programs, communication software, performance monitoring software), application software, Software hierarchy and dependence between the different layers, computer languages – Machine, Assembly level and High level, Inverter, Uninterrupted Power supply (UPS) – online and off line UPS, SMPS.

Unit – 2

15Hours

PCB Design: Types of PCB, Single sided board – double sided – Multilayer boards –Plated through holes technology – Benefits of Surface Mount Technology (SMT) –Limitation of SMT– Surface mount components: Resistors, Capacitor, Inductor, Diode and IC's.

LAYOUT AND ART WORK: Layout Planning–General rules of Layout–Resistance, Capacitance and Inductance – Conductor Spacing – Supply and Ground Conductors–Component Placing and mounting–Cooling requirement and package density–Layout check. Basic artwork approaches– Artwork taping guideline–General art work rules–art work check and Inspection.

LAMINATES AND PHOTO PRINTING: Manufacture of copper clad laminates

– Properties of laminates – Types of Laminates – Manual cleaning process – Basic printing process for double sided PCB’s – Photo resists – wet film resists – Coating process for wet film resists – Exposure and further process for wet film resists – Dry film resists.

ETCHING AND SOLDERING: Introduction–Etching machine–Etchant system. Soldering: Principles of Solder connection – Solder joints – Solder alloys–Soldering fluxes. Soldering Tools: Soldering, De soldering tools and Techniques – Man Soldering – Solder mask – Safety, health and medical aspects in Soldering practice.

Demonstration Experiments:

30 Hours

1. Unboxing and assembling of desktop computers
2. Types of motors and transformers used in household appliances
3. Understanding voltage, current, frequency etc. of ac mains.
4. Upgradation of RAM, hard disk and SSD
5. SMPS: Block diagram and working
6. Inverter
7. Types of PCB and fabrication process.

Reference books:

1. Electrical Circuits, K.A.Smith and R.E.Alley, Cambridge University Press.
2. A text book in Electrical Technology -B L Theraja- S Chand &Co.
3. A text book of Electrical Technology-A K Theraja.
4. Performance and design of AC machines-MG Say ELBS Edition.
5. Basic electrical engineering - V K Mehta and Rohit Mehta, S Chand and Company.
6. Computer fundamentals-Anita Goel, Pearson Edition.
7. Fundamentals of Computers-V Rajaram, Neeharika Adabala-PHI.
8. Computer Fundamentals- Peter Norton, McGraw-Hill Education
9. Walter C. Bosshart “PCB Design and Technology” Tata McGrawHill, Publications, Delhi. 1983.

Semester II
ELE-CT2: ANALOG AND DIGITAL ELECTRONICS
(Credits: Theory–04, Practical–02) Total Teaching hours:60

Course Objectives

Upon completing the syllabus contents of ELE-CT2, the student will become familiar with various working principles of widely used electronic devices, linear and digital ICs which help the students to build small projects and also be able to answer some basic questions that appear in competitive examinations.

UNIT-1

15HOURS

JFET–Types-p-channel and n-channel, working and I-V characteristics-n-channel JFET, parameters and their relationships, Comparison of BJT and JFET.

MOSFET: E–MOSFET, D–MOSFET–n-channel and p-channel, Construction, working, symbols, biasing, drain and transfer characteristics, MOS logic, symbols and switching action of MOS, NMOS inverter, CMOS logic, CMOS – inverter, circuit and working, CMOS characteristics, IGBT construction and working.

UJT - basic construction, working, equivalent circuit and I-V characteristics, intrinsic and-off ratio, relaxation oscillator.

SCR - Construction, VI characteristics, working, symbol, and applications – HWR and FWR.

UNIT-2

15HOURS

Op-Amp: Differential Amplifier, Block diagram of Op-Amp, Characteristics of an Ideal and Practical Op-Amp, Open and closed loop configuration, Frequency Response, CMRR, Slew Rate and concept of Virtual Ground.

Applications of op-amps: Concept of feedback, negative and positive feedback, advantages of negative feedback (Qualitative Study). Inverting and non-inverting amplifiers, Summing and Difference Amplifier, Differentiator, Integrator, Comparator and Zero-crossing detector.

Filters: First and second order active low pass, high pass and band pass Butter worth filters.

Oscillators: Barkhausen criterion for sustained oscillations, Colpitt's oscillator and crystal oscillators using transistor, Phase Shift oscillator, Wien-bridge oscillator – (no derivation for each)

IC 555Timer: Introduction, Block diagram, Astable and Monostable multivibrator circuits. (Numerical Examples wherever applicable)

UNIT-3

15HOURS

Combinational Logic Circuits: Minimization techniques using K-maps - SOP and POS, Minterm, Maxterm, SSOP, SPOS, Simplification of Boolean expressions, K-Map for 3 and 4 variable.

Design of Arithmetic logic circuits: Half Adder, Full Adder, Half Subtractor, Full Subtractor. 4-bit parallel binary adder, 2-bit and 4-bit magnitude comparator. Encoder, decimal to BCD priority encoder. Decoder, 2:4 decoder using AND gates, 3:8 decoder using NAND gates, BCD to decimal decoder, BCD to 7-Segment decoder, Multiplexer - 4:1 and 8:1 multiplexer, Demultiplexer - 1:4 and 1:8 demultiplexer – logic diagram and truth table of each.

UNIT 4

15 HOURS

Sequential Logic Circuits: Flip-Flops - SR Latch, RS, D and JK Flip-Flops.

Clocked (Level and Edge Triggered) Flip-Flops. Preset and Clear operations. Race-around conditions in JK Flip-Flop. Master- Slave JK and T Flip-Flops. Applications of Flip-Flops in semiconductor memories, RAM, ROM and types.

Registers and Counters: Types of Shift Registers, Serial-in-Serial-out, Serial-in-Parallel-out, Parallel-in-Serial-out and Parallel-in-Parallel-out Shift Registers (only up to 4 bits), applications. Ring counter, Johnson counter applications. Asynchronous Counters: Logic diagram, Truth table and timing diagrams of 4-bit ripple counter, modulo-n counters, 4 bit Up-Down counter, Synchronous Counter: 4-bit counter, Design of Mod 3, Mod 5 and decade Counters using K-maps.

Course Outcomes

At the end of this course, students will be able to

- Reproduce the I-V characteristics of various MOSFET devices,
- Apply standard device models to explain/calculate critical internal parameters of semiconductor devices.
- Explain the behavior and characteristics of power devices such as UJT, SCR, Diac, Triac etc.
- Perform experiments for studying the behavior of semiconductor devices.
- Calculate various device parameters' values from their IV characteristics.
- Interpret the experimental data for better understanding the device behaviour.
- Understand basic logic gates, concepts of Boolean algebra and techniques to reduce/simplify Boolean expressions
- Analyze combinatorial and sequential circuits

Reference Books:

- (1) Electronic devices and circuit theory by Boylestad, Robert Nashelsky
- (2) Electronic Devices Conventional Current Version by Thomas L.Floyd
- (3) David A. Bell "Electronic Devices and Circuits", 5th Edition, OxfordUni. Press, 2015
- (4) OP-Amps and Linear Integrated Circuit, R.A.Gayakwad, 4th edn,2000, Prentice Hall
- (5) Operational Amplifiers and Linear ICs, David A.Bell, 3rd Edition, 2011, Oxford University Press.
- (6) R.S.Sedha, "A Textbook of Applied Electronics", 7th edition., S.Chand and Company Ltd.2011
- (7) Thomas L. Floyd, Digital Fundamentals, Pearson Education Asia (1994)
- (8) Digital Principles and Applications, A.P.Malvino, D.P.Leachand Saha,7th Ed., 2011, Tata Mc Graw
- (9) Fundamentals of Digital Circuits, Anand Kumar, 2nd Edn, 2009, PHI Learning Pvt. Ltd.
- (10) Digital Circuits and systems, Venugopal, 2011, Tata McGrawHill.
- (11) Digital Systems: Principles & Applications, R.J.Tocci, N.S.Widmer, 2001, PHI Learning.
- (12) R.L.Tokheim, Digital Principles, Schaum's Outline Series, Tata McGraw-Hill(1994)
- (13) Digital Electronics, S.K. Mandal, 2010,1st edition, Mc GrawHill

ELE-CP2: ANALOG AND DIGITAL ELECTRONICS-Lab
(Hardware and Circuit Simulation Software)

PART A (Any FIVE)

1. Study of JFET/MOSFET characteristics–determination of parameters.
2. Study of single stage JFET amplifier. (frequency response and bandwidth)
3. UJT characteristics and relaxation oscillator
4. Design of inverting and non-inverting amplifier using Op-amp & study of frequency response.
5. Op-amp inverting and non-inverting adder, subtractor and averaging amplifier.
6. Study of the zero-crossing detector and comparator.
7. Design and study of first order high-pass and low-pass filters using op-amp.
8. Study of Colpitt's and crystal oscillator using transistor.
9. Astable multivibrator using IC555 timer.
10. Study of SCR Characteristics.

PART B (Any FIVE)

11. Half Adder and Full Adder using (a) logic gates (b) using only NAND gates.
12. Half Subtractor and Full Subtractor (a) logic gates (b) using only NAND gates.
13. 4-bit parallel binary adder & subtractor using IC7485
14. Study of BCD to decimal decoder using IC7447
15. Study of the Encoders and priority encoders.
16. Study of Multiplexer and De multiplexer using ICs.
17. Study of 2-bit and 4-bit magnitude comparators.
18. Study of Clocked RS, D and JK Flip-Flops using NAND gates.
19. Study of 4-bit asynchronous counter using JK Flip-Flop IC7476, modify to decade counter and study their timing diagrams.
20. Study of 4-bit Shift Register –SISO, modification to ring counter using IC -7495.
21. Digital to Analog converter using binary weighted resistor method, determination of resolution, accuracy and linearity error.

ELE-OE2.1: Electronics for Everyone

(Credits: Theory–02, Tutorial–01)

Total Teaching hours: 30

Unit-1

Timer and PLL: Functional block diagram of 555 timer, Monostable operation and its Application, Astable operation and its applications.

Phase Locked Loop: Functional block diagram–Phase detector/Comparator, Voltage Controlled Oscillator, Low pass filter, Applications: Frequency multiplier/Division, AM detection.

Unit-2

Operational Amplifier: Inverting and non-inverting amplifier, Op-amp parameters, Summing Amplifier, Difference Amplifier, Integrator, Differentiator, Instrumentation Amplifier, Audio Amplifier (LM386), Voltage to current converter, Current to Voltage converter, Sample and Hold circuits.

First order active filters (Circuit diagram and formula only): lowpass, high pass, band pass, band reject and all pass filters. Phase-shift and Wein bridge oscillator using op-amp.

Unit-3

Transducers (Basic Working): Displacement Transducers-Resistive (Potentiometric, Strain Gauges–Types, Gauge Factor, bridge circuits, Semi-conductor strain gauge) Capacitive (diaphragm), Hall effect sensors, magneto-strictive transducers, Microphone, Touch Switch, Piezoelectric sensors, light (photo-conductive, photo-emissive, photovoltaic, semiconductor, LDR), Temperature (electrical and non-electrical), Pressure sensor.

A-D and D-A Conversion: D-A conversion: 4-bit binary weighted resistor type, circuit and working. Circuit of R-2R ladder-Basic concept. A-D conversion characteristics, successive approximation ADC. (Mention the relevant ICs for all).

Unit-4

Data Acquisition using Arduino: Arduino: Birth, Open-Source community, Functional Block Diagram, Functions of each Pin, Arduino Development Boards: IDE, I/O Functions, Looping Techniques, Decision Making Techniques, designing of 1st sketch, Programming of an Arduino (Arduino ISP), Serial port Interfacing, Basic Interfacing and I/O Concept, Interfacing LED, Switch, 7seg LED, different sensors.

SuggestedBooks:

1. B. C. Sarkar and S. Sarkar, Analog Electronics: Devices and Circuits (Revised edition), Damodar Group (Publishers), Burdwan, ISBN:978-93-85775-15-4(2019)
2. Measurement Systems, 4/e, Doebelin McGrawHill, NewYork,1992.
3. Electrical Measurements &Electronic Measurements by A.K.Sawhney
4. B. C. Sarkar and S. Sarkar, Digital Electronics: Circuits and Systems, S UTPrakashani, Burdwan, ISBN:978-81-88391-57-8(2018)
5. Instrumentation- Devices and Systems By Rangan, Sarma, and Mani, Tata-McGrawHill
6. Electronic Instrumentation by H.S Kalsi, McGraw Hill
7. Instrumentation measurements and analysis by Nakra & Choudhary
6. Measurement &Instrumentation- DVS Murthy
7. R.A.Gayakwad, Op-Amps and LinearIC's,Pearson Education(2003)
8. Electronic Sensor Circuits and Projects, IIIVolume, For restMMims, Master Publishing Inc.
9. Timer, OpAmp, and Optoelectronic Circuits &Projects, Forrest MMims, Master Publishing Inc.
10. Exploring Arduino, Jeremy Blum, Wiley
11. Beginning Arduino, Michael McRobetr, Technology in Action
12. Beginning Arduino Programming, Brian Evans, Technology in Action
13. Practical Arduino Engineering, Harold Timmis, Technology in Action
14. Practical Arduino : Cool Projects for open source hardware, Jonathan Oxer, Hugh Blemings, Technology in Action

Electronics for Everyone Demonstration Lab

(Hardware and Circuit Simulation Software)

30hours

1. Study of basic monostable multivibrator
2. Study of basic Astable multivibrator
3. Light detection using 555timer
4. Rain alarm using 555 timer
5. Motor control by PWM using 555 timer
6. LED flasher circuit using 555 timer

7. Analog light wave Transmitter/Receiver using 555 timer
8. Study of basic inverting and non-inverting amplifier
9. Study of basic integrator circuit
10. Study of basic differentiator circuit
11. Design of first order LPF
12. Study of first order HPF
13. Designing of fiber optic-based Transmitter/Receiver using LM386
14. Temperature to voltage converter using 741.
15. Shadow sensing using 741
16. Light based PWM using 741 and V-F converter
17. Test the different Arduino Boards, Open-Source and Arduino Shields.
18. Install Arduino IDE and its development tool.
19. Develop a program to Blink LED for 1 second.
20. Develop a program to interface Input Switches and output LEDs with development board (Arduino).
21. Interface 7 segment display with development board (Arduino)
22. Interface LM35 temperature sensor with Arduino and monitor temperature on serial monitor.
23. Interface DC motor using L293D Motor Driver.
24. Interfacing of various sensors with Arduino development board

ELE-OE 2.2: Mobile Communication
(Credits: Theory–02, Tutorial–01) Total Teaching hours: 60

Unit 1

Evolution of mobile radio communication-Examples of wireless communication system: paging systems, cordless telephone system, cellular telephone system-Trends in cellular radio and personal communication systems.

Unit 2

Frequencies for radio transmission- Basics of multiplexing and multiple access techniques-CDMA-Cellular system concepts-Frequency Reuse-Channel assignment and handoff strategies- Improving capacity in cellular system: cell splitting, sectoring, repeaters for range extension, a microcell zone concept.

Unit3

Introduction to telecommunicating system-GSM: mobile services (Bearer services, tele-services, supplementary services), system architecture (radio subsystem, network and switching subsystem, operation subsystem)

Unit4

Satellite system: history, application, basics, routing, localization and handover-Broadcast system: digital audio broadcasting, digital video broadcasting (basic concepts).

Unit5

Wireless LAN-Infrared vs radio transmission-Bluetooth: user scenario sand architecture-WiMAX: basic concepts and features-Wi-Fi-basic concepts.

Mobile Communication–Demonstration Lab

30hours

1. Demonstration of keypad mobile handset.
2. Demonstration of smart phone handset.
3. Block diagram description.

Text Books

1. Rapapport T. S, 'Wireless Communication Principles and Practices', Pearson Education Asia, NewDelhi, 3rd ED.2003
2. Jochen Schiller,' Mobile communication 'Pearson Education, Asia.

Reference Book

Vijay K Garg, Joseph E Wilkes, 'Principles and Applications of GSM', Pearson Edu.

SEMESTER: I/II

ELECTIVE COURSE and PAPER: ELECTRONICS – I/II

1. FORMATIVE ASSESSMENT (Max. Marks = 10)		
ASSESSMENT TYPE	DETAILS/METHOD	MARKS
Test	Theory paper IA tests	10
2. SUMMATIVE ASSESSMENT (End Semester Examination)		
Theory Examination (Max. Marks = 40; Duration -2 Hrs)		
Question Paper Pattern		
Section – A (Medium Length Answer questions)		
<ul style="list-style-type: none">• Total Questions = 5. Questions to be answered = 4• Each question carries 5 marks• Max. Marks = 4 x 5 = 20 Marks		
Section – B (Long Answer questions)		
<ul style="list-style-type: none">• Total Questions = 3. Questions to be answered = 2• Each question carries 10 marks• Max. Marks = 2 x 10 = 20 Marks		

KUVEMPU UNIVERSITY

**BOARD OF STUDIES (BOS) IN ELECTRONICS
(UNDER GRADUATE PROGRAMME)**

APPROVED SYLLABUS

(To be effective from the academic year 2022-23)

For

3rd AND 4th SEMESTER ELECTRONICS PAPERS

of

B.Sc./B.Sc.(HONS.) DEGREE PROGRAMME

[Framed in according with the National Education policy (NEP-2020)
& based on *Model Electronics Syllabus* prepared by electronics expert committee,
Karnataka State Higher Education Council, Bangalore]

*Syllabus approved in the Board of Studies (BOS) meeting held on 12-09-2022 at the
Department of Post-Graduate in Physics and Research, Jnana Sahyadri, Shankaraghatta*

Curriculum Structure - Electronics (Core and Electives)

Semesters- 3rd and 4th SEM

SEMESTERS	DSC	Core Papers
Semester-3:	ELE CT-3.1	Programming in C and Digital Design using Verilog (Theory)
	ELE CP-3.1	Programming in C and Digital Design using Verilog (Practical)
Semester -4:	ELE CT- 4.1	Electronic Communication-I (Theory)
	ELE CP- 4.1	Electronic Communication-I (Practical)

Open Electives for 3rd and 4th Semesters

Sl.No.		3 rd Semester-OE
1.	ELE OE 3.1	Fundamentals of Electronics. (Theory)
2.	ELE OE 3.2	Application of Electronics-1 (Theory)
3.	ELE OE 3.3	Robotics. (Theory)
4.	ELE OE 3.4	Medical Electronics. (Theory)
Sl.No.		4 th Semester-OE
1.	ELE OE 4.1	Application of Electronics-2 (Theory)
2.	ELE OE 4.2	Augmented and Virtual Reality (Theory)
3.	ELE OE 4.3	IOT and Applications (Theory)

Model Curriculum

Program Name	BSc in Electronics	Semester	Third Semester
Course Title	Programming in C and Digital Design using Verilog (Theory)		
Course Code:	ELE CT3.1	No. of Credits	4
Contact hours	60 Hours	Duration of SEA/Exam	2 hours
Formative Assessment Marks	40	Summative Assessment Marks	60

Course Objectives: After the successful completion of the course, the student will be able to:

- The ability to code and simulate any digital function in Verilog HDL.
- Know the difference between synthesizable and non-synthesizable code.
- Understand library modeling, behavioral code and the differences between simulator algorithms and logic verification using Verilog simulation.
- Learn good coding techniques required for current industrial practices.
- Gain the knowledge of programming the system using C programming language.

Course Outcomes (COs): After the successful completion of the course, the student will be able to:

- CO1. Apply the acquired knowledge of digital circuits in different levels of modeling using Verilog HDL.
 CO2. Apply the acquired knowledge of digital circuits in different levels of modeling using Verilog HDL.
 CO3. Design and verify the functionality of digital circuit/system using test benches.
 CO4. Develop the programs more effectively using directives, Verilog tasks and constructs.
 CO5. Design and analyze algorithms for solving simple problems.
 CO6. Write and execute and debug C codes for solving problems.

Contents	60Hrs
Unit-1:	15 Hrs
<p>C Programming: Introduction, Importance of C, Structure of C program, Character set, Tokens, keywords, identifier, constants, basic data types, variables: declaration & assigning values.</p> <p>Arithmetic operators, relational operators, logical operators, assignment operators, increment and decrement operators, conditional operators, bitwise operators, expressions and evaluation of expressions, precedence of operators.</p>	

Arrays: Basics of arrays, one -dimensional array declaration, accessing elements, storing elements, two-dimensional. Input output statement – printf(), scanf() and getch(), and library functions (math and string related functions).

Unit -2:

15 Hrs

Decision making, branching, and looping: if, if-else, else-if, switch statement, break, for loop, while loop and do loop.

Functions: Defining functions, function arguments and passing, returning values from functions, example programs.

Structures: Structure type declarations, structure declarations, referencing structure members, referencing whole structures, initialization of structures,

Unit -3:

15 Hrs

Overview of Verilog HDL: Evolution of CAD, emergence of HDLs, typical HDL flow, Trends in HDLs.

Hierarchical Modeling Concepts: Top-down and bottom-up design methodology, differences between modules and module instances, parts of a simulation, design block, stimulus block, Lexical conventions. Data types, system tasks, compiler directives.

Modules and Ports: Module definition, port declaration, connecting ports, hierarchical name referencing.

Gate-Level Modeling: Modeling using basic Verilog gate primitives, Description of and/or and buf/not type gates, Rise, fall and turn-off delays, min, max, and typical delays. Combinational logic circuit design using Gate level modeling

Unit -4:

15 Hrs

Dataflow Modeling: Continuous assignments, delay specification, expressions, operators, operands, operator types.

Behavioral Modeling: Structured procedures, initial and always, blocking and non-blocking statements. Delay control; generate statement, event control, conditional statements, Multi way branching, loops, sequential and parallel blocks.

Tasks and functions: Differences between tasks and functions, declaration, invocation, automatic tasks and functions.

References	
1	Samir Palnitkar, “Verilog HDL: A Guide to Digital Design and Synthesis,” 2 nd Edition, Prentice Hall PTR, 2006.
2	E. Balagurusamy, “Programming in ANSI C”, 4 th Edition, Tata McGraw-Hill, 2008.
3	Donald E. Thomas, Philip R. Moorby, “The Verilog Hardware Description Language”, 5 th Edition, Springer, 2002.
4	Michael D. Ciletti, “Advanced Digital Design with the Verilog HDL”, 2 nd Edition, Pearson Education, 2010.
5	Padmanabhan, Tripura Sundari, “Design through Verilog HDL”, Wiley Eastern, 2016.
6	Nazeih M. Botors, “HDL Programming VHDL and Verilog”, 1 st Edition, Dreamtech Publication, New Delhi, 2006.
7	Yashavant P. Kanetkar, “Let us C”, 18 th Edition, BPB Publications, 2021.
8	T Jeyapoovan, “A First Course in Programming with C,” Vikas Publishing Pvt LTD, 2004.
9	Kevin Skahill, “VHDL for Programmable Logic,” Pearson Education, 2006.
10	Cyril P R, “Fundamentals of HDL Design,” Pearson, 2010.

Program Name	BSc in Electronics	Semester	Third Semester
Course Title	Programming in C and Digital Design using Verilog (Practical)		
Course Code:	ELE CP-3.1	No. of Credits	2
Formative Assessment Marks	25	Summative Assessment Marks	25
Note: Minimum of 10 programs to be written and executed in each section			

Part -A: Programming in C Laboratory

Write and execute C Program to

1. Find the area and circumference of a circle
2. Find the biggest OR smallest elements in a series
3. Find the factorial of a given number
4. Check the prime number in a series
5. Find the roots of quadratic equation
6. Find the gross salary of an employee
7. Remove all vowels from a string
8. Upper case and lower-case conversion and vice-versa
9. Reverse a string using library functions
10. Reverse a string without using library
11. Check whether the string is palindrome or not
12. Arrange the array in ascending OR descending order using bubble sort
13. To perform arithmetic operations for a matrix.
14. Display prime numbers between intervals 0 to 100
15. Find GCD of two numbers.

Part – B: Verilog HDL Laboratory

Write and execute Verilog code to realize

1. Realization of logic gates.
2. Encoder without priority and with priority.
3. Multiplexer, De-multiplexer.
4. Comparator, Code converters – Binary to Gray and vice versa.
5. Adder/Subtractor (Half and Full) using different modeling styles.
6. 4-bit parallel adder and 4-bit ALU/8-bit ALU.
7. SR, D, JK, T-flip-flops.
8. To realize counters: Up/Down (BCD and Binary).
9. 4-bit Binary counter, BCD counters (Synchronous reset) and any arbitrary sequence counters.
10. 4-bit Binary counter, BCD counters (Asynchronous reset) and any arbitrary sequence counters.
11. Modeling of Universal shift registers.

Program Name	BSc in Electronics	Semester	Third Semester
Course Title	Fundamentals of Electronics. (Theory)	Course Code:	ELE OE 3.1
Contact hours	45 Hours	No. of Credits	3
Formative Assessment Marks	40	Summative Assessment Marks	60
OE Paper is to be offered for the Students other than Science stream			

Theory Contents	
Unit-1:	15 Hrs
<p>Passive Components: Overview of passive Components-Fabrication, Types, color coding, and applications.</p> <p>Transformer: Principle, construction and working, turn ratio, Types of transformers (Step up and Step down).</p> <p>Semiconductors: Intrinsic and extrinsic semiconductors.</p> <p>Diodes: P-N Junction theory, V-I Characteristics, Rectifiers, Clippers, and Clampers (Qualitative analysis only).</p> <p>Special diodes: Zener diode, LED and LDR; Construction, working and applications.</p>	
Unit -2:	15 Hrs
<p>Bipolar Junction Transistor (BJT): Physical structures, modes of operations, characteristics. Transistor as an amplifier, RC- Coupled amplifier, Darlington pairs, Transistor as a switch.</p> <p>Field Effect Transistor (FET): Physical structures and modes of operations, Characteristics.</p> <p>Electronic Instruments: Ammeter, Voltmeter- design and construction, analog millimeter, Digital millimeter, function generator (Qualitative analysis only). Cathode Ray Tube (CRT), Cathode Ray Oscilloscope (CRO)- Block diagram.</p> <p>Digital fundamentals: Binary numbers, signed binary numbers, binary to decimal and Decimal to Binary conversion, Binary additions, and Subtractions, Logic gates: AND, OR and NOT gates.</p>	
Unit -3:	15 Hrs
<p>Component and Device Applications: To design and Construct at least Ten of the following circuits.</p>	

1. V –I characteristics of semiconductor diode.
2. V –I characteristics of Zener diode. Determination of breakdown voltage.
3. V –I characteristics of LED. Determination of Cut-in voltage.
4. Characteristics of LDR.
5. Half wave rectifier; with and without filter. Determination of ripple factor.
6. Full wave rectifier (Centre tap/ Bridge); With and without filter, determination of ripple factor.
7. Zener diode voltage regulator; determination of line and load regulation.
8. Clipping circuits; Positive clipper, Negative Clipper, Biased positive and negative clippers. Trace the input and output waveforms.
9. Clamper circuits: Positive clamper, Negative Clamper. Trace the input and output waveforms.
10. Input and output characteristics of a transistor in Common Emitter configuration, determine of current gain β .
11. Input and output characteristics of a transistor in common base configuration, determine the current gain α .
12. Transistor as a switch.
13. Construct RC coupled amplifier. Plot the frequency response curve and determine the bandwidth.
14. V-I Characteristics of Common Source (CS) configuration of FET. Determine the current gain.
15. Construct an ammeter to read (0-1ma) of current.
16. Construct a voltmeter to read (0-1volt).
17. Measure V_p , V_{pp} and Time period of Sine and Square waves using CRO.
18. Construct OR, AND and NOT gates using diodes and transistors. Verify the truth tables.
19. Verify the truth tables OR, AND and NOT gates using Integrated Chips (ICs).
20. Construct four-bit binary adder.

References	
1	“A Textbook of Electronics” R. S. Sedha; S Chand and Co, 3 rd edition.
2	“Principles of Electronics”, V K Mehta and Rohit Mehta, S Chand and Co
3	“Basic Electronics”, B L Theraja, S Chand and Co, 3 rd edition 2012
4	“Electronic Devices”, Devid Bell, Reston Publishing Company.
5	“Electronic Devices and Circuit Theory”, Pearson edition.
6	“Digital Principles and Applications”, Malvino and Leach
7	“Electronics text lab manual”, Paul B Zabar

Program Name	BSc in Electronics	Semester	Third Semester
Course Title	Application of Electronics-1 (Theory)	No. of Credits	3
Course Code:	ELE OE 3.2	Contact hours	45 Hours
Formative Assessment Marks	40	Summative Assessment Marks	60
OE Paper is to be offered for the Students other than Science stream			

Theory Contents	
Unit-1: Basic Electronics	12 Hrs
Introduction to circuit components- Resistors, capacitors, inductor, transformer, diode and transistor. Symbols, pipples. LED and LCD display, relay, fuse, switches, wires. AC and DC applications.	
Unit -2: Applied Electronics	13 Hrs
Electronic instruments: DMM, CRO, Biomedical instruments-ECG, EEG, EMG, pH meter, X-ray, sphygmomanometer, Glucometer, Digital thermometer. Sensor-OMR, MICR, Scanner, Barcode reader.	
Unit -3: Power Supplies	10 Hrs
Dc power supply, Rectifiers-principle, Types Inverter and UPS. Adopter and SMPS. Inverter and UPS. Mobile chargers.	
Unit -4: Electronic calculators	10 Hrs
Types, Functions of Basic calculators-block diagram, Keypad using, use of calculator.	

References	
1	Basic Electronics-Solid State – B L Theraja - S Chand And Company Ltd
2	Electronic Devices And Circuit Theory – Robert L Boylestad And Louis Nashelsky (PHI)

Program Name	BSc in Electronics	Semester	Third Semester
Course Title	Robotics. (Theory)	No. of Credits	3
Course Code:	ELE OE3.3	Contact hours	45 Hours
Formative Assessment Marks	40	Summative Assessment Marks	60
OE Paper is to be offered for the Students other than Electronics stream			

Theory Contents	
Unit-1:	15 Hrs
<p>Definitions of Robots, Robotics, Motivation, A Brief History of Robotics, A Robot System, Interdisciplinary Areas in Robots, Classification of Robots, Introduction to embedded system, Understanding Embedded System, Overview of basic electronics and digital electronics. Microcontroller vs. Microprocessor, Common features of Microcontroller. Comparison between the two Different types of microcontrollers. Sensors, Classification of sensors (contact & non-contact), characteristics of sensors, Touch sensor, Position sensor, optical sensor, IR, PIR, Ultrasonic, temperature, displacement sensor.</p>	
Unit -2:	15 Hrs
<p>Getting Started with Programming platform of Robots: Installation of IDE, Pin configuration and architecture of Microcontroller (Atmel series/arduino), Device and platform features. Concept of digital and analog ports. Familiarizing with Interfacing Board, Introduction to Embedded C platform, Review of Basic Concepts, Arduino data types, Variables and constants, Operators, Control Statements, Arrays Functions, I/o Functions, Pins Configured as INPUT, Pins Configured as OUTPUT, Incorporating timedelay() function, delay Microseconds() function ,millis () function , micros() function</p>	
Unit -3:	15 Hrs
<p>Programming different types of Robots:</p> <ol style="list-style-type: none"> 1. Temperature & Humidity controlled Robot (Fan Regulation, thermostat) 2. Infra-Red signal Controlled Robot (Measuring the speed of the vehicle) 3. Ultra-sonic signal operated Robot (automatic Tap system/Hand Drier/Floor drier) 4. Obstacle Follower & avoider Robot 	

References	
1	Fundamentals of Robotics by D K Pratihar
2	Robotics Simplified: An Illustrative Guide to Learn Fundamentals of Robotics,by Dr. Jisu Elsa Jacob , Manjunath N
3	Introduction to Robotics Fourth Edition by John Craig
4	Arduino Robotics by John-David Warren (Author), Josh Adamsduino
5	Programming in 24 Hours by Richard Blum
6	Getting Started with Arduino: The Open Source Electronics Prototyping Platform Book by Massimo Banzi and Michael Shiloh

Program Name	BSc in Electronics	Semester	Third Semester
Course Title	Medical Electronics. (Theory)	No. of Credits	3
Course Code:	ELE OE 3.4	Contact hours	45 Hours
Formative Assessment Marks	40	Summative Assessment Marks	60
OE Paper is to be offered for the Students other than Electronics stream			

Theory Contents	
Unit-1:	10Hrs
Fundamental Electronics: Amplifiers, Frequency response, signal generation. Different types of transducers & their selection for biomedical applications. Electrode theory, selection criteria of electrodes & different types of electrodes Bio electric amplifiers	
Unit -2:	12 Hrs
Introduction to Bio-medical instruments: Origin of bio-electric signals, active & passive transducer for medical application –Electrocardiography-waveform-standard lead systems, typical ECG amplifier, EEG electrode, recording systems, EMG basic principle-block diagram of a recorder.	
Unit -3:	10 Hrs
Medical Imaging: Nature and production of X-rays, Improving X-ray images, Computerized axial tomography, Using ultrasound in medicine, Ultrasound scanning, Magnetic resonance imaging PET and SPECT Imaging	
Unit -4:	13Hrs
Biomedical Signal Processing: Fundamentals of signal processing, digital image, transforming image, image enhancement, image Segmentation, image compression, image restoration and reconstruction of medical images. Demonstration using MATLAB	

References	
1	L Cromwell, F J Weibell, Eapfeiffer, Biomedical Instrumentation and measurements, PHI Publications.

Program Name	BSc in Electronics		Semester	Fourth Semester
Course Title	Electronic Communication-I (Theory)			
Course Code:	ELE CT 4.1	No. of Credits	4	
Contact hours	60 Hours	Duration of SEA/Exam	2 hours	
Formative Assessment Marks	40	Summative Assessment Marks	60	

Course Objectives:

- To understand the communication system, Principle and working communication system, means and medium of communication.
- To understand the Principle and working of different modulation techniques.
- Will be able to differentiate between analog and digital communication.
- To understand the Principle and working of Satellite and optical fibre communication.

Course Outcomes (COs): After the successful completion of the course, the student will be able to:

CO1. Know the basic concept of Analog Communication, means and medium of communication.

CO2. Understand the principle of Analog and digital modulation.

CO3. Familiar with “AM” and “FM “techniques.

CO4. Understand the basic concept of Pulse Modulation, Carrier Modulation for digital transmission and able to construct simple pulse modulation.

CO5. Understand the basic concept of Satellite Communication

CO6. Understand the basic concept of Optical Fibre Communication

Contents	60Hrs
Unit–1:	15 Hrs
<p>Electronic communication: Introduction to communication – means and modes. Need for modulation. Block diagram of an electronic communication system. Brief idea of frequency allocation for radio communication system in India (TRAI). Electromagnetic communication spectrum,</p>	

Propagation of “EM” Wave: Introduction, Loss of “EM” Energy due to noise, Ground Wave, Sky-wave and Space-wave propagation. Ionosphere and its effects.

Communication medium: Transmission lines, coaxial cables, wave guides and optical fibers.

Antenna: Introduction, Antenna parameters, yagi-Uda antenna, Dish-antenna, principle, Working and applications only

Unit -2:

15 Hrs

Analog Modulation: Amplitude Modulation, modulation index and frequency spectrum. Generation of AM (Emitter Modulation), Amplitude Demodulation (diode detector), Concept of Single side band generation and detection. Frequency Modulation (FM) and Phase Modulation (PM), modulation index and frequency spectrum, equivalence between FM and PM, Generation of FM using VCO, FM detector (slope detector), Qualitative idea of Super heterodyne receiver.

Analog Pulse Modulation: Channel capacity, sampling theorem, Basic Principles- PAM, PWM, PPM, modulation and detection technique for PAM only, Multiplexing

Unit -3:

15 Hrs

Digital Pulse Modulation: Need for digital transmission, Pulse Code Modulation, Digital Carrier Modulation Techniques.

Introduction to Communication and Navigation systems: Satellite Communication Introduction, need, geosynchronous satellite orbits, geostationary satellite advantages of geostationary satellites. Satellite visibility, transponders (C - Band), path loss, ground station, simplified block diagram of earth station. Uplink and downlink.

Unit -4:

15 Hrs

Optical Fiber Communication: Optical Fibers: fundamentals, Nature of light, basic optical laws and definitions, optical fiber types, Rays and modes, Signal degradation in optical fibers, attenuation, scattering losses, radiation losses, absorption losses, core and cladding losses, signal distortion in optical wave guides, dispersion, pulse broadening in graded index wave guide.

Optical sources: LEDs, structure, source materials, Laser diodes: Structures, threshold conditions, modal properties and radiation patterns

Optical Receiver Operations: Fundamental receiver operations, digital signal transmission, receiver noise, analog receivers.

References	
1	Electronic Communications, D. Roddy and J. Coolen, Pearson Education India.
2	Advanced Electronics Communication Systems- Tomasi, 6th edition, Prentice Hall.
3	Modern Digital and Analog Communication Systems, B.P. Lathi, 4th Edition, 2011, Oxford University Press.
4	K.D Prasad, "Antenna and Wave Propagation", Satyaprakashan, New Delhi.
5	Sanjeev Gupta, "Electronic Communication Systems", Khanna Publishers, New Delhi.
6	Electronic Communication systems, G. Kennedy, 3rd Edn., 1999, Tata McGraw Hill.
7	Principles of Electronic communication systems – Frenzel, 3rd edition, McGraw Hill
8	Communication Systems, S. Haykin, 2006, Wiley India Electronic Communication system, Blake, Cengage, 5th edition.
9	Wireless communications, Andrea Goldsmith, 2015, Cambridge University Press
10	Gerd Keiser, "Optical Fibre Communication ", McGraw Hill, 3 rd Edn.

Program Name	BSc in Electronics	Semester	Fourth Semester
Course Title	Electronic Communication-I (Practical)		
Course Code:	ELE CP 4.1	No. of Credits	2
Formative Assessment Marks	25	Summative Assessment Marks	25
Note: Minimum of 10 Experiments are to be performed using hardware and simulation.			

List of Experiments	
1.	Construct amplitude modulator using transistor / I. C. Determination the modulation index.
2.	Construct frequency modulator circuit – determine the modulation index.
3.	“AM” Liner Diode detector- traces the input and output waveforms.
4.	Frequency mixer circuit – Verify output frequency for different input frequencies.
5.	“FM” Detector – Plot the frequency response curve.
6.	Study of Balanced demodulator
7.	Study of IF amplifier circuit.
8.	Pulse amplitude modulation (PAM) – trace the output waveforms.
9.	Pulse width modulation (PWM) – trace the output waveforms.
10.	Pulse position modulation (PPM) – trace the output waveforms.
11.	Characteristics of LED in OFC
12.	Study of Numerical aperture
13.	Characteristics of photo diode or photo transistor in OFC
14.	Setting up simple OFC Link.

Program Name	BSc in Electronics	Semester	Fourth Semester
Course Title	Application of Electronics-2 (Theory)	No. of Credits	3
Course Code:	ELE OE 4.1	Contact hours	45 Hours
Formative Assessment Marks	40	Summative Assessment Marks	60
OE Paper is to be offered for the Students other than Science stream			

Theory Contents	
Unit-1: Introduction to Advanced Communication	12 Hrs
Radio, TV- principles, block diagram & applications OFC applications and advantages, Embedded system – Smart card, SIM card Mobiles- Block diagram & applications	
Unit -2: Advance Electronics	12 Hrs
CCTV camera, ATM- principles, block diagram & applications Electronic voting Machine (EVM)- CU,BU,VVPAT.,	
Unit -3: Application of Satellite	11 Hrs
Types, EDUSAT, TV & Internet-modem, Wi-Fi.	
Unit -4: E-waste management	10 Hrs
E-waste management-identification, segregation, disposal	

References	
1	Basic Electronics-Solid State – B L Theraja - S Chand And Company Ltd

Program Name	BSc in Electronics	Semester	Fourth Semester
Course Title	Augmented and Virtual Reality (Theory)	No. of Credits	3
Course Code:	ELE OE 4.2	Contact hours	45 Hours
Formative Assessment Marks	40	Summative Assessment Marks	60
OE Paper is to be offered for the Students other than Electronics stream			

Theory Contents	
Unit-1: Introduction to Virtual Reality	10Hrs
Defining Virtual Reality, History of VR, Human Physiology and Perception, Key Elements of Virtual Reality Experience, Virtual Reality System, Interface to the Virtual World-Input & output- Visual, Aural & Haptic Displays, Applications of Virtual Reality.	
Unit -2: Augmented Reality	10 Hrs
AR: Taxonomy, technology and features of augmented reality, difference between AR and VR, Challenges with AR, AR systems and functionality, Augmented reality methods, visualization techniques for augmented reality.	
Unit -3: The Geometry of Virtual Worlds &The Physiology of Human Vision	12 Hrs
Geometric Models, Changing Position and Orientation, Axis-Angle Representations of Rotation, Viewing Transformations, Chaining the Transformations, Human Eye, eye movements & implications for VR. #Exemplar/ Case Studies Sweeping coverage of eye movements	
Unit -4: Visual Perception & Rendering and Motion & Tracking	13 Hrs
Visual Perception - Perception of Depth, Perception of Motion, Perception of Color, Combining Sources of Information Visual Rendering -Ray Tracing and Shading Models, Rasterization, Correcting Optical Distortions, Improving Latency and Frame Rates #Exemplar/ Case Studies Automatic stitching of panoramas in Virtual Reality. Motion in Real and Virtual Worlds- Velocities and Accelerations, The Vestibular System, Physics in the Virtual World, Mismatched Motion and Vection Tracking- Tracking 2D & 3D Orientation, Tracking Position and Orientation, Tracking Attached Bodies.	
References	
1	E. Balagurusamy, - Computing Fundamentals and C Programming, Tata McGraw-Hill, 2008.
2	Anand R., “Augmented and Virtual Reality”, Khanna Publishing House, Delhi.

References

- | | |
|---|---|
| 3 | R.G.Dromey, How to Solve by Computer, Pearson Education, Inc, Reprint 2009. |
| 4 | Yashavant P. Kanetkar, —Let Us C, Fifth Edition, Sridhara Publication, India, 2008. |

Program Name	BSc in Electronics	Semester	Fourth Semester
Course Title	IOT and Applications (Theory)	No. of Credits	3
Course Code:	ELE OE 4.3	Contact hours	45 Hours
Formative Assessment Marks	40	Summative Assessment Marks	60
OE Paper is to be offered for the Students other than Electronics stream			

Theory Contents	
Unit-1:	12 Hrs
Fundamentals of IoT: Introduction, History of IoT, Definitions & Characteristics of IoT, IoT Architectures, Physical & Logical Design of IoT, Enabling Technologies in IoT, Components of an IoT Solution, IoT frameworks, IoT and M2M, Open Source and Commercial Examples, Competing Standards for IoT	
Unit -2:	12 Hrs
Sensors Networks: Definition, Traditional Data Storage, Analog and Digital I/O Basics, Types of Sensors, Types of Actuators, Examples and Working, IoT Development Boards: Arduino IDE and Board Types, RaspberriPi Development Kit, RFID Principles and components, Wireless Sensor Networks: History and Context, The node, Connecting nodes, Networking Nodes, WSN and IoT.	
Unit -3:	11 Hrs
Wireless Technologies for IoT: WPAN Technologies for IoT: IEEE 802.15.4, Zigbee, HART, NFC, Z-Wave, BLE, Bacnet, Modbus. IP Based Protocols for IoT IPv6, 6LowPAN, RPL, REST, AMPQ, CoAP, MQTT. Edge connectivity and protocols	
Unit -4:	10 Hrs
Data Handling& Analytics: Introduction, Bigdata, Types of data, Characteristics of Big data, Data handling Technologies, Flow of data, Data acquisition, Data Storage Applications of IoT: Home Automation	

References	
1	Internet of Things, Vasudevan, Nagrajanand and Sundaram, Wiley India.
2	Srinivasa K G “Internet of Things”, Cengage Learning, India 2017.

References

3	David Hanes, Gonzalo Salgueiro, Patrick Grosstete, Robert Barton, Jerome Henry, IoT fundamentals: Networking Technologies, Protocols and uses cases for the Internet of things, 1 st Edition, Pearson Education.
4	Iot Fundamentals, David Hence et al, Cisco press.

KUVEMPU UNIVERSITY
NEP-2020

Pattern of continuous Evaluation and Semester End Examination

Assessment should be a combination of continuous formative evaluation and an end-point summative evaluation as per the Guidelines provided by Karnataka state Higher education Council.

Total marks for each course shall be based on continuous assessments and semester-end examinations as per the uniform pattern of 40: 60 for IA and Semester End theory examinations respectively and 50: 50 for IA and Semester End practical examinations respectively, in all the Universities, their Affiliated and Autonomous Colleges.

Total Marks for each course = 100

Continuous assessment (C1) = 20 marks

Continuous assessment (C2) = 20 marks

Semester End Examination (C3) = 60 marks

i. Formative evaluation process (Internal Assessment).

- a. The first component (C1) of assessment is for 20 marks. This shall be based on tests, assignments, seminars, case studies, fieldwork, project work etc. This assessment and score process should be completed after completing 50% of the syllabus of the course/s and within 45 working days of the semester program.
- b. The second component (C2) of assessment is for 20 marks. This shall be based on the test, assignment, seminar, case study, fieldwork, internship / industrial practicum/project work etc. This assessment and score process should be based on the completion of the remaining 50 per cent of the syllabus of the courses of the semester.

Activities	C1	C2	Total Marks
Session Test	10 marks	10 marks	20 marks
Seminars/Presentations/Activity	10 marks	-	10 marks
Case study/Assignment/Fieldwork/Project work etc.	20 marks	10 marks	10 marks
	20 marks	20 marks	40 Marks

ii. Summative evaluation process (Semester End theory Examination).

During the 17th – 19th week of the semester, a semester-end examination shall be conducted by the University for each course. This forms the third and final component of assessment (C3) and the maximum marks for the final component will be 60 marks.

iii. Practical Examination: For the practical course of full credits, marks shall be for **50 marks** awarded as follows

Internal Assessment for 25 Marks: 15 Marks for maintaining Practical record and 10 marks for practical test. Test shall be conducted after the completion of Practical Classes.

End Semester Practical Examination: End Semester Practical examination shall be conducted for **25 marks**.

**QUESTION PAPER PATTERN FOR DEGREE COURSES
(DSC, OE and Languages)**

First Semester Degree Examination, April/May 2022

(CBCS NEP Scheme)

Paper: DSC-

Time: 02 Hours

Max. Marks: 60

I. Select the most appropriate answer from the options provided: 10 x 1 = 10

- 1).....
 a) b) c) d)
- 2).....
 a) b) c) d)
- .
 .
 .
- 10).....
 a) b) c) d)

II. Answer/Write short notes on any **FIVE** of the following: 05 x 03 = 15

- 1)
- 2)
- 3)
- 4)
- 5)
- 6)
- 7)
- 8)

III. Answer any **THREE** questions from the following: 03 x 05 = 15

- 1)
- 2)
- 3)
- 4)
- 5)

IV. Answer the following* 02 x 10 = 20

1) -----
 OR

2) -----
 OR

*May have sub questions if required



DEPARTMENT OF ENGLISH

SYLLABI FOR UNDERGRADUATE DEGREE PROGRAMMES

(AS PER NEP 2020)

Approved on September 23rd and 27th 2022, BOS (UG)

Effective for batches commencing from 2021 onwards

For III and IV Semester BA / BSW / B.Com / BBA /TTM /

BSC / BCA Degree Courses


KUVEMPU UNIVERSITY
DEPARTMENT OF ENGLISH

(AS PER NEP 2020)

Approved on SEPTEMBER 23rd AND 27th 2022, by BOS (UG)

Effective for Batches commencing from 2021 onwards

ABILITY ENHANCEMENT COMPULSORY COURSE (AECC)

LANGUAGE (AECC)-L2-GENERIC ENGLISH

BA/BSW/ UG Programmes offered by Kuvempu University

SEMESTER III

Total Credits for the Program : 03

Year of implementation : 2022-23

Teaching hours per Week : 04

Title of the Course: GENERIC ENGLISH - L2			
Number of Theory Credits	Number of hours per Week	Number of lecture hours/semester	Duration of Exam
03	04	48/55	02 hours
Formative Assessment :		40	
Summative Assessment Marks: 60			
Total Marks		100	

Course Objectives

1. To enhance LSRW (Listening, Speaking, Reading, Writing) skills
2. To develop interpersonal communicative skills
3. To augment presentation skills
4. To develop the ability to critically analyze, interpret and appreciate literary texts
5. To inculcate an openness to, and appreciation of, social, cultural, religious and ethnic diversities
6. To train students for new and emerging professional positions like – content writers, interpreters, translators, transcribers
7. To facilitate preparation for competitive examinations like: UPSC/KPSC/IBPS/SSC/RAILWAYS/TOEFL/IELTS and others

Course Outcomes

At the end of the course, the students will have:

1. Acquired enhanced LSRW(Listening, Speaking, Reading, Writing skills
2. Been equipped with interpersonal communicative skills
3. Augmented their presentation and analytical skills
4. Developed an ability to critically analyse, interpret and appreciate literary texts
5. Developed an openness to, and appreciation of social, cultural, religious and ethnic diversities
6. Developed the skills required for employability in emerging professional positions such as – content writers, interpreters, translators, transcribers
7. Acquired language skills for successfully facing competitive examinations like: UPSC/KPSC/IBPS/SSC/RAILWAYS/TOEFL/IELTS and others.

Syllabus for III Semester BA/BSW (AECC)

Under the Faculty of Arts

III SEMESTER		48 / 55 hrs	60 Marks
READING SKILLS/LISTENING SKILLS /SPEAKING AND WRITING SKILLS			
UNIT-1			
UNIT-1 READING SKILLS	Short Plays	17 hrs	
	<ol style="list-style-type: none"> 1. Pie and the Tart-Hugh Chester man 2. Dear Departed – Stanley Houghton 3. Scenes from Shakespeare <ul style="list-style-type: none"> • Forum Scene – Julius Caesar • Court Scene – Merchant of Venice 		
Unit -2 Listening Skills	Persuasive Speeches		
	<ol style="list-style-type: none"> 1. Swami Vivekananda – Chicago Speech at world parliament http://www.youtube.com 2. Tagore- Crisis of Civilization – http://www.youtube.com 3. Abdul Kalam – My vision for India (http://www.youtube.com) 4. Ambedkar- Constituent Assembly Speech 1946 (http://www.youtube.com) 	08 hrs	
UNIT-3 SPEAKING SKILLS	PRESENTATION SKILLS	14 hrs	
	<p>Types:</p> <ol style="list-style-type: none"> 1. Introduction to Speaking Skills and good Presentation (features of good presentation) 2. Presentation Skills – informative Presentation / Persuasive Presentation / Decision making 		
UNIT-4 WRITING SKILLS	INTRODUCTION TO WRITING AND TYPES OF WRITING	16 hrs	
	<ol style="list-style-type: none"> 1. Introduction to good Writing and types of Writing 2. Job Application with C.V 3. Complaint letter (1. Civic Problems, 2. Complaint to Principal about grievances in the college) 4. Permission letter 5. Advertisement 6. Product Manual 7. Poster / Brochure Writing 		

KUVEMPU  **UNIVERSITY**
DEPARTMENT OF ENGLISH

(AS PER NEP 2020)

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ABILITY ENHANCEMENT COMPULSORY COURSE

LANGUAGE (AECC)-L2-GENERIC ENGLISH

BCOM/BBA/TTM UG programmes offered by Kuvempu University

SEMESTER III

Total Credits for the Program : 03

Year of implementation : 2022-23

Teaching hours per Week : 04

Title of the Course: GENERIC ENGLISH - L2			
Number of Theory Credits	Number of Hrs/ Week	Number of Lecture Hours	Duration of Exam
03	04	48/55	02 hours
Formative Assessment : 40			
Summative Assessment Marks: 60			
Total Marks 100			

Course Objectives

1. To enhance LSRW (Listening, Speaking, Reading, Writing skills
2. To develop interpersonal communicative skills
3. To augment presentation skills
4. To develop the ability to critically analyze, interpret and appreciate literary texts
5. To inculcate an openness to, and appreciation of, social, cultural, religious and ethnic diversities
6. To train students for new and emerging professional positions like – content writers, interpreters, translators, transcribers
7. To facilitate preparation for competitive examinations like: UPSC/KPSC/IBPS/SSC/RAILWAYS/TOEFL/IELTS and others

Course Outcomes

At the end of the course the students will have:

1. Acquired enhanced LSRW(Listening, Speaking, Reading, Writing skills
2. Been equipped with interpersonal communicative skills
3. Augmented their presentation and analytical skills
4. Developed an ability to critically analyse, interpret and appreciate literary texts
5. Developed an openness to, and appreciation of social, cultural, religious and ethnic diversities
6. Developed the skills required for employability in emerging professional positions such as – content writers, interpreters, translators, transcribers
7. Acquired language skills for successfully facing competitive examinations like: UPSC/KPSC/IBPS/SSC/RAILWAYS/TOEFL/IELTS and others.

Syllabus for III Semester BCOM/BBA/TTM (AECC)

Under the Faculty of Arts

III SEMESTER		48 / 55 Hrs	60 Marks
READING SKILLS/LISTENING SKILLS /SPEAKING AND WRITING SKILLS			
UNIT-1			
UNIT-1 READING SKILLS	Short Plays	17 hrs	
	One Act Plays <ol style="list-style-type: none"> 1. Remember Caesar - Gordon Daviot. 2. A Day of Atonement – Margaret Wood 3. Scenes from Shakespeare <ul style="list-style-type: none"> • Assassination Scene(Julius Caesar) • Banquet Scene (Macbeth) 		
Unit -2 Listening Skills	Persuasive Speeches		
	<ol style="list-style-type: none"> 1. Dalai Lama – Nobel Peace prize acceptance Speech (www.youtube.com) 2. Charlie Chaplin’s final speech from The Great Dictator (www.youtube.com) 3. Gandhi – Quit India Speech (www.youtube.com) 4. Swamy Vivekananda – Chicago Speech at World Parliament (www.youtube.com) 	08hrs	
UNIT-3	BUSINESS CORESPONDENCE	14 hrs	
Writing Skill	<ol style="list-style-type: none"> 1. Letter of enquiry and reply 2. Letter of order 3. Letter of complaint and Reply 4. Letter of Job Application with CV 5. Product Promotion letters 6. Sales letters 		
UNIT-4	Commercial Writing	16 hrs	
	<ol style="list-style-type: none"> 1. Advertisement writing 2. Product manual 3. Poster / Brochure Writing 		


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ABILITY ENHANCEMENT COMPULSORY COURSE

LANGUAGE (AECC)-L2-GENERIC ENGLISH

BSC / BCA UG programmes offered by Kuvempu University

SEMESTER III

Total Credits for the Program : 03

Year of Implementation : 2022-23

Teaching hours per Week : 04

Title of the Course: GENERIC ENGLISH - L2			
Number of Theory Credits	Number of hours per Week	Number of lecture hours/semester	Duration of Exam
03	04	48/55	02 hours
Formative Assessment : 40			
Summative Assessment Marks: 60			
Total Marks 100			

Course Objectives

1. To enhance LSRW (Listening, Speaking, Reading, Writing skills)
2. To develop interpersonal communicative skills
3. To augment presentation Skills
4. To develop the ability to critically analyze, interpret and appreciate literary texts
5. To inculcate an openness to, and appreciation of, social, cultural, religious and ethnic diversities
6. To train students for new and emerging professional positions like – content writers, interpreters, translators, transcribers
7. To facilitate preparation for competitive examinations like: UPSC/KPSC/IBPS/SSC/RAILWAYS/TOEFL/IELTS and others

Course Outcomes

At the end of the course the students will have:

1. Acquired enhanced LSRW(Listening, Speaking, Reading, Writing skills)
2. Been equipped with interpersonal communicative skills
3. Augmented their presentation and analytical skills
4. Developed an ability to critically analyse, interpret and appreciate literary texts
5. Developed an openness to, and appreciation of social, cultural, religious and ethnic diversities
6. Developed the skills required for employability in emerging professional positions such as – content writers, interpreters, translators, transcribers
7. Acquired language skills for successfully facing competitive examinations like: UPSC/KPSC/IBPS/SSC/RAILWAYS/TOEFL/IELTS and others.

Syllabus for III Semester BSC/BCA/ Degree Courses (AECC)

Under the Faculty of Arts

III SEMESTER		48 / 55 Hrs	60 Marks
READING SKILLS/LISTENING SKILLS /SPEAKING AND WRITING SKILLS			
UNIT-1 READING SKILLS	One Act Plays		
	1. The Death Trap – Saki (H.H Munro) 2. Progress – Saint Irvin 3. Scenes from Shakespeare <ul style="list-style-type: none"> • Sleep Walking Scene (Macbeth) • The Reconciliation Scene (Tempest) 	17 hrs	
Unit -2 Listening Skills	Persuasive Speeches		
	<ul style="list-style-type: none"> • Steve Jobs - Commencement address • Martin Luther King- Dream Speech • Gandhi - Quit India Speech • Ngugi Wa Thiong'o's: Moving the Center 25/April/2008 You Tube: University California Television(U.CTV) 	10hrs	
UNIT-3 SPEAKING SKILLS	PRESENTATION SKILLS	14 hrs	
	<ul style="list-style-type: none"> • Introduction to Speaking Skills and good presentation • Features of good presentation • Presentation skills • Persuasive / Informative presentation 		
UNIT-4 WRITING SKILLS	INTRODUCTION TO WRITING AND TYPES OF WRITING	14 hrs	
	<ul style="list-style-type: none"> • Introduction to good Writing and types of Writing • Job Application with C.V • Complaint letter (1. Civic Problems, 2. Complaint to Principal about grievances in the college) • Permission letter • Advertisement • Product Manual • Poster / Brochure Writing 		

Third Semester: Optional English DSC – 5
Title of the Paper – British Literature up to 1800: Part -I
(Chaucer to the Age of Transition)

Course Title – British Literature up to 1800 :Part-I (Chaucer to the Age of Transition)	
Total Contact Hours : 36/40	Course Credits : 03
Formative Assessment : 40	Internal Assessment
Summative Assessment Marks: 60	Duration of ESA/Exam : 02 Hours

Total Marks: 100

Course Objectives:

- To introduce the learners to the meaning, forms, terms and concepts of literature
- To provide an overview of the main genres of literature and introduce major Writers.
- To enable the learners to appreciate literature
- To introduce major features of British literature up to 1800

Course Outcome:

After completion of course, the student will be able to:

- Learn the important trends and movements in the British literature of the prescribed period
- Identify and understand the canonical literature of England
- Distinguish the poets, playwrights and novelist of different periods
- Appreciate some representative texts of the prescribed period

Syllabus for III Semester Optional English:DSC-5

Under the Faculty of Arts

III SEMESTER BA (Optional)		36 to 40 hrs	60 Marks
DSC 5 – British Literature Up to 1800 : Part -1 (Chaucer to the Age of Transition)			
UNIT-1	Background (History of English literature Up to 1800) <ol style="list-style-type: none"> 1. Social context of 14th Century 2. Renaissance and its features. Its impact on literature 3. Elizabethan Drama 4. Metaphysical Poetry- Features 5. Development of novel in the 17th &18th Century 6. Neo Classical Temper 	10 hrs	
Unit -2	Introducing Major Authors and their Works <ol style="list-style-type: none"> a) Geoffrey Chaucer b) Francis Bacon c) John Milton d) John Dryden e) Alexander Pope f) Jonathan Swift 	6hrs	
UNIT-3	Representative Texts Poetry : <ol style="list-style-type: none"> a) Sonnet- Shall I Compare Thee - William Shakespeare b) Batter My Heart – John Donne c) Poison Tree – William Blake Essay: <ol style="list-style-type: none"> a) Of Studies – Francis Bacon b) Tombs in Westminster Abbey – Joseph Addison Drama: <ol style="list-style-type: none"> a) Julius Caesar- William Shakespeare 	24 hrs	
References:	<ol style="list-style-type: none"> 1. Evans, Ifor. <i>Elizabethan Drama</i>. OUP 1989 2. Ford, Boris. <i>Pelican Book of English Literature</i>. Book 3 & 4, Penguin, 1955. 3. Gardner, Helen ed. <i>The Metaphysical Poets</i>.OUP, 1967 4. ±ÉÃµÀVjgÁªï J̄ ï.J,ï. EAVèµï ,Á»vÀå ZÀjvÉæ, 1991 5. Trevelyan G.M. <i>The English Social History</i> Penguin, 1942 		

Third Semester: Optional English DSC – 6
Title of the Paper – Indian Literatures in Translation

Course Title – Indian Literatures in Translation	
Total Contact Hours : 36/40	Course Credits : 03
Formative Assessment : 40	Internal Assessment
Summative Assessment Marks: 60	Duration of ESA/Exam : 02 Hours

Total Marks : 100

Course Objectives

- To Introduce learners to the basics of Translation Studies
- To Familiarise learners to various Concepts of Translation
- To enable learners to appreciate Translated Texts

Course Outcome:

After completion of course, students will be able to:

- Understand the meaning and methods of translation
- Comprehend the scope of translation in the modern age
- Have the knowledge of Indian writers and literature in general
- Appreciate the translated texts

Syllabus for III Semester Optional English (DSC-6)

Under the Faculty of Arts

III SEMESTER BA (Optional) DSC 6 – Indian Literatures in Translation		36 to 40 hrs	60 Marks
UNIT-1	<p>Introduction to Translation Studies and Concepts</p> <p>Terms:</p> <ol style="list-style-type: none"> 1. Translation – Types of Translation : <ul style="list-style-type: none"> • word to word Translation • Free Translation • Summaries 2. Transcreation 3. Adaptation / localisation <p>Essay :</p> <ul style="list-style-type: none"> • Indian Literature in English Translation - 	10 hrs	
Unit -2	<p style="text-align: center;">Representative Texts</p> <p>Poems:</p> <ol style="list-style-type: none"> a. Cripple Me Father - Basavanna (From Speaking of Shiva) b. Vachana NO. 26 Illusion Has Troubled Body – Akkamahadevi (From Speaking of Shiva) c. Do not Quarrel Over Caste – Kanakadasa (tr. by S. G Vaidya) d. White Paper – Daya Pawar e. The Mad – K Sachidanandan <p>Critical Essay: Shanthveri Gopal Gowda : The Native Socialist – by Nataraja Hulyar</p>	10hrs	
UNIT-3	<ol style="list-style-type: none"> 1. Play- Silence, The Court is in Session – Vijay Tendulkar 2. Short Stories – <ol style="list-style-type: none"> a. The Weed – Amritha Preetham b. Toba Tek Singh - Sadat Hassan Manto 	20 hrs	marks

References:

- a. Bassnet, Susan. *Translation Studies*. Routledge, 1980
- b. Devi G. N. *Indian Literary Criticism*. OUP, 2002
- c. Mukherjee, Sujeth. *Translation as Discovery*. Pen craft International, 1981
- d. Niranjana, Tejaswini. *Siting Translation*. University of California Press, 1992
- e. G. S. Nayak. *Translation and Cultural Studies*. Sage Publications, 1993
- f. Steiner, George. *After Babel: Aspects of Language and Translation*. OUP, 1975
- g. Trivedi, Harish & Susan Bassnet (eds) *Post Colonial Translation: Theory And Practice*. Routledge, 1999.
- h. G. S. Nayak. *Translation and Cultural Studies*. Sage Publications, 2014


KUVEMPU UNIVERSITY
DEPARTMENT OF ENGLISH

(AS PER NEP 2020)

Approved on SEPTEMBER 23rd and 27th 2022, BOS (UG)

Effective for batches commencing from 2021 onwards

ABILITY ENHANCEMENT COMPULSORY COURSE

LANGUAGE (AECC)-L2-GENERIC ENGLISH

BA/BSW/ UG Programmes offered by Kuvempu University

SEMESTER IV

Total Credits for the Program : 03

Year of Implementation : 2022-23

Teaching hours per Week : 04

Title of the Course: GENERIC ENGLISH - L2			
Number of Theory Credits	Number of hours per Week	Number of lecture hours/semester	Duration Exam
03	04	48/55	02 Hours
Formative Assessment :		40	
Summative Assessment Marks: 60			
Total Marks		100	

Course Objectives

- To enhance the student's creative interpretative and critical thinking
- To Equip the students to communicate confidently and effectively
- To prepare for various interviews and professional contexts
- To build persuasive and creative social media writing skills
- To develop analytical and evaluative skills
- To train students to identify and understand regional and global contexts and ethical frameworks in texts and narratives
- To enable students for self - expression

Course Outcomes

By the end of the course students will have

- Acquired creative, interpretative and critical thinking
- Skills to communicate confidently and effectively
- Obtained persuasive and creative social media writing skills
- Developed analytical and evaluative skills
- Learnt to identify and understand social contexts and ethical frameworks in the texts
- Ability to articulate their view with clarity and confidence
- Eligibility to take up jobs such as content writing, journalism and such other jobs with proficiency in English

Syllabus for IV Semester BA/BSW Degree for Courses(AECC)

Under the Faculty of Arts

IV SEMESTER		48 / 55 hrs	60 Marks
READING SKILLS/LISTENING SKILLS /SPEAKING AND WRITING SKILLS			
UNIT-1 READING SKILLS	Novel: Animal Farm – George Orwell	20hrs	
Unit -2 LISTENING AND DECODING	<p>Listen to and understand Ted Talks</p> <ol style="list-style-type: none"> 1. Rise of cricket and Rise of India by Harsha Bhogle (www.youtube.com) 2. The Fight against Sex Slavery by Sunitha Krishnan (https://www.ted.com/talks/sunita_krishna) <p>Poems</p> <ol style="list-style-type: none"> 1. Money Madness- D.H. Lawrence www.youtube.com 2. Crutches by Bertolt Brecht (www.youtube.com) 	10hrs	
UNIT-3 SPEAKING SKILLS	PRODUCTIVE SKILLS	14 hrs	
	<ol style="list-style-type: none"> 1. Group Discussion 2. Public Speaking 3. Interview Skills 		
UNIT-4 WRITING SKILLS	INTRODUCTION TO WRITING AND TYPES OF WRITING	14 hrs	
	<ol style="list-style-type: none"> 1. Technical Writing <ul style="list-style-type: none"> • Travel Writing • Article Writing (Newspaper / Journal) 2. E-Correspondence and Content Writing Skills –E-mail <ul style="list-style-type: none"> • Casual • Professional (apology letters, Appreciation letters, Congratulation letters, Termination letters, Promotion letters,) 3. Social Media Writing <ul style="list-style-type: none"> • Blog Writing • Writing on face book • Twitter 		


KUVEMPU UNIVERSITY
DEPARTMENT OF ENGLISH

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ABILITY ENHANCEMENT COMPULSORY COURSE

LANGUAGE (AECC)-L2-GENERIC ENGLISH

BSC/BCA/ UG programmes offered by Kuvempu University

SEMESTER IV

Total Credits for the Program : 03

Year of implementation : 2022-23

Teaching hours per week : 04

Title of the Course: GENERIC ENGLISH - L2			
Number of Theory Credits	Number of hours per Week	Number of lecture hours/semester	Duration Exam
03	04	48/55	02 Hrs
Formative Assessment :		40	
Summative Assessment Marks:		60	
Total Marks		100	

Course Objectives

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- To Equip the students to communicate confidently and effectively
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- To develop analytical and evaluative skills
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- Developed analytical and evaluative skills
- Learnt to identify and understand social contexts and ethical frameworks in the texts
- Ability to articulate their view with clarity and confidence
- Eligibility to take up jobs such as content writing, journalism and such other jobs with proficiency in English

Syllabus for IV Semester BSC/BCA Degree Courses (AECC)

Under the Faculty of Arts

IV SEMESTER		48 / 55 hrs	60 marks
READING SKILLS/LISTENING SKILLS /SPEAKING AND WRITING SKILLS			
UNIT-1 READING SKILLS	Novel: Overcoat – Nikolai Gogol	20hrs	
Unit -2 Listening and Decoding	Listen to and understand Ted Talks 1. Ideas for India’s future by Nandan Neelakeni 2. How to Make Peace by Kailash Satyarthi (https://you Tube / HI72bpitzpo) 3. Why We Have Too Few women Leaders by Sheryl Sandberg (https://www.Ted.Com Talk /Shery/-)	10hrs	
UNIT-3 SPEAKING SKILLS	PRODUCTIVE SKILLS	14 hrs	
	1. Group Discussion 2. Public Speaking 3. Interview Skills		
UNIT-4 WRITING SKILLS	INTRODUCTION TO WRITING AND TYPES OF WRITING	14 hrs	
	1. Technical Writing <ul style="list-style-type: none"> ● Travel writing ● Article writing (Newspaper / Journal) 2. E-Correspondence and Content Writing skills –E-mail <ul style="list-style-type: none"> ● Casual ● Professional (apology letters, Appreciation letters, Congratulation letters, Termination letters, Promotion letters,) 3. Social Media Writing <ul style="list-style-type: none"> ● Blog Writing ● Writing on face book ● Twitter 		


KUVEMPU UNIVERSITY
DEPARTMENT OF ENGLISH

(AS PER NEP 2020)

Approved on SEPTEMBER 23rd and 27th 2022, BOS (UG)

Effective for batches commencing from 2021 onwards

ABILITY ENHANCEMENT COMPULSORY COURSE

LANGUAGE (AECC)-L2-GENERIC ENGLISH

Bcom/ BBA/TTM UG programmes offered by Kuvempu University

SEMESTER IV

Total Credits for the Program : 03

Year of implementation : 2022-23

Teaching hours per week : 04

Title of the Course: GENERIC ENGLISH - L2			
Number of Theory Credits	Number of hours per Week	Number of lecture hours/semester	Duration Exam
03	04	48/55	02 hrs
Formative Assessment :		40	
Summative Assessment Marks:		60	
Total Marks		100	

Course Objectives

- To enhance the student's creative interpretative and critical thinking
- To Equip the students to communicate confidently and effectively
- To prepare for various interviews and professional contexts
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Course Outcomes

By the end of the course students will have

- Acquired creative, interpretative and critical thinking
- Skills to communicate confidently and effectively
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- Learnt to identify and understand social contexts and ethical frameworks in the texts
- Ability to articulate their view with clarity and confidence
- Eligibility to take up jobs such as content writing, journalism and such other jobs with proficiency in English

Syllabus for IV Semester B.Com/BBA/TTM Degree Courses (AECC)

Under the Faculty of Arts

IV SEMESTER		48 / 55 hrs	60 marks
READING SKILLS/LISTENING SKILLS /SPEAKING AND WRITING SKILLS			
UNIT-1 READING SKILLS	Novel: Animal Farm – George Orwell	20hrs	marks
Unit -2 Listening and Decoding	<p>Listen to and understand Ted Talks</p> <ol style="list-style-type: none"> 1. Women should rethink their inheritance – Leila Seth (www.youtube.com) 2. Power of perspective – Preethi Sreenivasan (www.youtube.com) <p>Poems</p> <ol style="list-style-type: none"> 1. Soap by Nissim Ezekiel (www.youtube.com) 2. My People by Siddalingaiah 	10hrs	
UNIT-3 SPEAKING SKILLS	PRODUCTIVE SKILLS	14 hrs	
	<ol style="list-style-type: none"> 1. Group Discussion 2. Public Speaking 3. Interview Skills 		
UNIT-4 WRITING SKILLS	INTRODUCTION TO WRITING AND TYPES OF WRITING	14 hrs	10 marks
	<ol style="list-style-type: none"> 1. Technical Writing <ul style="list-style-type: none"> • Travel Writing • Article Writing (Newspaper / Journal) 2. E. correspondence and Content Writing Skills –E-mail <ul style="list-style-type: none"> • Casual • Professional (apology letters, Appreciation letters, Congratulation letters, Termination letters, Promotion letters,) 3. Social Media Writing <ul style="list-style-type: none"> • Blog Writing • Writing on face book • Twitter 		

Fourth Semester: Optional English DSC – 7
Title of the Paper – British Literature: Part -2
(19th and 20th Century)

Course Title – British Literature: Part -2 (19th and 20th Century)	
Total Contact Hours : 36/40	Course Credits : 03
Formative Assessment : 40	Internal Assessment
Summative Assessment Marks: 60	Duration of ESA/Exam : 02 Hours

Total Marks : 100

Course Outcome:

After completion of course, students will be able to:

- Learn the important trend and movements in the British literature of prescribed period
- Identify and understand canonical literature of England
- Distinguish the poets, playwrights and novelists of different periods
- Appreciate some representative texts of the prescribed period

Syllabus for IV Semester BA Optional English (DSC-7)

Under the Faculty of Arts

IV SEMESTER BA (Optional) DSC 7 – British Literature: Part -2(19th and 20th Century)		36 to 40 hrs	60 Marks
UNIT-1	<ol style="list-style-type: none"> 1. The Romantic Age – Features 2. Victorian Age – Features 3. Modern Novel- Features 4. Modern Poetry - Features 5. Problem Plays 	10 hrs	
Unit -2	<p style="text-align: center;">Introducing Representative Writers</p> <ol style="list-style-type: none"> 1. William Words worth 2. Mathew Arnold 3. T.S. Eliot 4. W.B. Yeats 5. D.H. Lawrence 6. Jane Austen 7. Thomas Hardy 	10hrs	
UNIT-3	<p style="text-align: center;">Representative Texts</p> <p>Poetry:</p> <ol style="list-style-type: none"> 1. Daffodils – William Wordsworth 2. Ode to Autumn – John Keats 3. Dover Beach – Matthew Arnold 4. Journey of the Magi – T.S Eliot 5. The Second Coming – W.B. Yeats 6. Unknown Citizen – W.H. Auden <p>Novel: The Mayor of Casterbridge - Thomas Hardy</p> <p>Essays: All About A Dog – A G Gardner</p>	20 hrs	
<p>References:</p> <ol style="list-style-type: none"> 1. Bowra, C.M. <i>The Romantic Imagination</i> OUP, 1949 2. Brooks, Cleanth. <i>Modern Poetry and Tradition</i>. North Carolina Press. 1967 3. Sanders, Andrew. <i>English Literature</i>. OUP, 2005 4. William, George. <i>Reader's Guide to T.S Eliot</i> Syracuse University Press, 1929 <p>Note: Teachers are advised to look at important articles / books available in Internet.</p>			

Fourth Semester: Optional English DSC – 8
Title of the Paper – Gender Studies: Part -1

Course Title – Gender Studies : Part -1	
Total Contact Hours : 36/40	Course Credits : 03
Formative Assessment : 40	Internal Assessment
Summative Assessment Marks: 60	Duration of ESA/Exam : 02 Hours

Total Marks:100

Course Outcome:

After completion of the course, students will be able to:

- Understand the concept of gender studies
- Learn the basics of patriarchy, sex, gender and gynocentrism
- Understand the significance of Gender as a discourse
- Appreciate literature by woman writers

Syllabus for IV Semester Optional English (DSC-8)

Under the Faculty of Arts

IV SEMESTER BA (Optional) DSC 8 – Gender Studies :Part-1		36 to 40 hrs	60 marks
UNIT-1	<p>Introduction to Gender Studies : Concepts and Trends</p> <ol style="list-style-type: none"> 1. Sex and Gender 2. Femininity 3. Patriarchy 4. Masculinity 5. Third Gender 6. Gender and Caste <p>Essay:</p> <ol style="list-style-type: none"> 1. Writing Caste, Writing Gender by Sharmila Rege 	10 hrs	
Unit -2	<p>Introducing Representative Writers</p> <ol style="list-style-type: none"> 1. Savitri Bai Phule 2. Mahashweta Devi 3. Sara Abubakar 4. Akkai Padmashali 5. Anupama Niranjana 6. Meena Kanda Swamy 	10hrs	
UNIT-3	<p>Texts and Autobiographies</p> <p>Short Stories:</p> <ol style="list-style-type: none"> 1. The Veil – Ismat Chughtai 2. Gulabi Talkies – Vaidhehi 3. Khol Do – Sadat Hassan Manto <p>Poems:</p> <ol style="list-style-type: none"> 1. Women’s Work – Julia Alvarez 2. The Prisons We Broke – Baby Kamble <p>Autobiography:</p> <ol style="list-style-type: none"> 1. Extracts from Pratibha Nandakumar’s autobiography (Anudhinada Antara gange) <p>Chapters:</p> <ol style="list-style-type: none"> 1. Mouna Kaniveya Marnudi 2. Bajari, Naalayak 	20 hrs	marks

References:

1. Butler, Judith, *Gender Trouble*, Routledge 1990
2. Connell R.W *Masculinities*. University of California Press,1995
3. Geetha V. *Gender* 2002
4. Revathi A, *The Truth About Me: A Hijra Life Story*. Penguin 2010
5. Tharu, Susie and Lalitha. K (eds) *Women’s Writing from India Vol-2*, OUP, 1997
6. Mary Evans (ed) *Gender: The Key Concepts*. Routledge 2013.

Kuvempu University

Undergraduate Courses – English Open Elective (as per NEP 2020)

Open Elective – 03

Title: SPOKEN ENGLISH FOR CORPORATE JOBS (Prescribed for III Semester)

Title: SPOKEN ENGLISH FOR CORPORATE JOBS (Prescribed for III Semester)	
Number of Hours per Week : 03	Course Credits : 03
Formative Assessment : 40	Duration of ESA/Exam : 02 Hours
Summative Assessment Marks: 60	Total Marks: 100

Course and Skill Outcome:

1. This paper teaches students the skills in the front desk management
2. It introduces them to business English

Section I: English for Front Desk Management:

1. Greeting, Welcoming.
2. Dealing with Complaints, Giving Instructions or Directions.
3. Giving Information: About Various Facilities, Distance, Area, Local Specialties.
4. Consultation and Solution of Problems.
5. Accepting Praises and Criticism, Apologizing

Section II: Fluency and Etiquette:

1. Polite sentences and words.
2. Use of persuading words.
3. Intonation and Voice Modulation.
4. Developing Vocabulary.

Section III: Business Speeches:

1. Principles of Effective Speech and Presentations.
2. Speeches: Introduction, Vote of Thanks, Occasional Speech, Theme Speech.
3. Use of Audio-Visual Aids in Presentations.

Section IV: Cross-Cultural Communication:

1. Dealing with Language Differences.
2. Probing Questions to get Information.
3. Etiquette in Cross-Cultural Communication.

Suggested Readings:

1. More Effective Communication – J V Vilanilam, Sage Publication Pvt. Ltd.
2. Effective Documentation & Presentation – Rai& Raj Himalaya Publishing House, Mumbai
3. Commercial Correspondence & Office Management – R S N Pillai&Bhagawati, S Chand & Co.
4. Communication Today – Ray Rubeen, Himalaya Publishing House, Mumbai
5. Business Communication – Lesikar and Pettit – AITBS Publishers, Delhi
6. Business Communication Today – SushilBahl – Response Books, Sage Publication, N.Delhi
7. The Essence of Effective Communication – Ludlow & Panton PHI, N.Delhi.
8. Business Communication – PradhanBhende&Thankur, Himalaya Publishing House, Mumbai
9. Mastering Communication Skills and Soft Skills – N Krishnaswamy, LalithaKrishnaswamy and others – Bloomsbury, New Delhi, 2015
10. Developing Communication Skills – Krishna Mohan and Banaji

Kuvempu University

Undergraduate Courses – English Open Elective (as per NEP 2020)

English Open Elective – 4

Title: SPEAKING AND LISTENING SKILLS (Prescribed for Fourth Semester)

Title: SPEAKING AND LISTENING SKILLS (Prescribed for Fourth Semester)	
Number of Hours per Week : 03	Course Credits : 03
Formative Assessment : 40	Duration of ESA/Exam : 02 Hours
Summative Assessment Marks: 60	Total Marks: 100

- 1. Section I: Introduction to Good Speaking Skills – Acquiring Language –LSRW Skills.**
- 2. Section II: Speaking Skills**
Formal and Informal Speeches: Language Functions: Greetings, Making Requests, Persuading, Complaining, Apologizing, Asking for and Giving Permission, Instruction and Directions, Agreeing and Disagreeing, Seeking for/Giving Advice and Inviting.
- 3. Section III: Listening Skills**
 - Definition of Listening: Listening versus and Hearing, Process of Listening, Problems the Students face in Listening; Sub-skills of Listening
 - What is good listening?
 - Barriers to listening
 - Strategies of listening
 - Listening activities: listening to news broadcast, telecast and news bulletins
- 4. Section IV: Presentation Skills**
 - Definition, Meaning and Goals of Presentation
 - Some useful expressions while making presentations – opening remarks, stating purposes, giving an outline, giving preliminary information and starting with a context, emphasizing important points, drawing attention to visuals, making recommendation, keeping audience involved, summarizing and concluding, inviting questions.
 - Presentation in practice – Making Welcome speech, Introducing guests to audience, Making farewell speech, Proposing Vote of Thanks

Suggested Reading:

- Kenneth and Anderson and Tony Lynch, Study Speaking, OUP
- Sethy J. Et.Al., Practice Course in English Pronunciation, Princeton Hall
- Prasad P. Communication Skills
- Balasubrahmanya. A Course in Phonetics for Indian Students, MacMillan
- Jayashree Mohanraj, Speak Well, Black Swan

ASSESSMENT

Mode of Evaluation and Distribution of Marks

- The course shall carry a total of 100 marks.
- There shall be semester – end written examination for all the courses conducted by the Examination Division of the University for 60 Marks.
- In each semester, there shall be Internal Evaluation for 40 Marks.

Formative Assessment : - 40

Summative Assessment Marks: - 60

Total Marks : - 100

A. FORMATIVE ASSESSMENT - 40 MARKS

FORMATIVE ASSESSMENT		
Internal Test	10+10=	20
Presentation / Seminar		10
Assignment	5+5	10
	Total	40

DEPARTMENT OF HINDI

CBCS – NEP Syllabus (Languages)

B.Sc. III Semester

Paper III – Hindi Natak Sahitya Aur Anuvad

- Unit 1** : Komala Gandhara – Shankar Shesh
Publishers, Parameshwari Prakashan, New Delhi
- Unit 2** : Vyavaharik Anuvad, Kannada/English – Hindi
Hindi - Kannada/English

Question Paper Pattern

Unit 1 – 40 Marks – Annotations and Questions

Unit 2 – 20 Marks – Passages

B.Sc. IV Semester

Paper IV

Hindi Upanyas Sahitya, Bhasha Parichaya

Unit 1 : Daud – Mamata Kalia

Unit 2 : Bhasha Parichaya

Question Paper Pattern

Unit 1 – 40 Marks – Short Notes and Questions

Unit 2 – 20 Marks – Short Notes and Questions

DEPARTMENT OF HINDI

CBCS – NEP Syllabus (Languages)

B.C.A. III Semester

Paper III – Hindi Kavya Aur Vyakaran

- Unit 1** : Hindi Kavya Sangraha - Shashi Shekar Tiwari
Publishers, Vani Prakashan, New Delhi.
(Prasad, Nirala, Pant, Dinakar, Nagarjuna)
- Unit 2** : Grammar – Nouns, Pronouns, Adjectives, Verbs –
Types and Usages
Linga, Vachana, Karaka, Avyaya - Types and Usages

Question Paper Pattern

Unit 1 – 40 Marks – Annotations and Questions

Unit 2 – 20 Marks – Questions

B.C.A. IV Semester

Paper IV

Hindi Natak Aur Anuvad

Unit 1 : Ab Gareebi Hatao - Sarveshwar Dayal Saxena
Publishers, Vani Prakashan, New Delhi

Unit 2 : Vyavaharik Anuvad, Kannada/English – Hindi
Hindi - Kannada/English

Question Paper Pattern

Unit 1 – 40 Marks – Annotations and Questions

Unit 2 – 20 Marks – Passages

DEPARTMENT OF HINDI

CBCS – NEP Syllabus (Languages)

B.Com. III Semester

Paper III – Hindi Kavya Aur Patra Lekhan

- Unit 1** : Kavya Suman – Mahendra Kulasresta
Publishers, Rajpal and Sons, New Delhi
(Poems 6 to 14)
- Unit 2** : Patra Lekhan
Vanijya Patra – Avedan Patra, Pooch-Tach Ke Patra,
Shikayati Patra, Vanijya Paripatra

Sarakari Patra – Samanya Sarakari Patra,
Ardha Sarakari Patra, Paripatra, Press Notes

Question Paper Pattern

Unit 1 – 40 Marks – Annotations and Questions

Unit 2 – 20 Marks – Questions

B.Com. IV Semester

Paper IV

Hindi Natak Sahitya Aur Prayojanmoolak Hindi

- Unit 1** : Ek Aur Dronacharya – Shankar Shesh
Publishers, Parameshwari Prakashan, New Delhi
- Unit 2** : Importance of Hindi as Official Language and
Link Language, Constitutional Provisions of
Official Language (Articles 343 to 351)

Question Paper Pattern

Unit 1 – 40 Marks – Annotations and Questions

Unit 2 – 20 Marks – Questions

DEPARTMENT OF HINDI

CBCS – NEP Syllabus (Languages)

B.B.M. / B.B.A. III Semester

Paper III – Hindi Kavya Aur Vyakaran

- Unit 1** : Hindi Kavya Kunja – Dr. Vishnu Sarvade
Publishers, Rajkamal Prakashan, New Delhi
(Prasad, Nirala, Varma, Gupta, Chouhan, Nagarjuna)
- Unit 2** : Grammar – Nouns, Pronouns, Adjectives, Verbs –
Types and Usages
Linga, Vachana, Karaka, Avyaya - Types and Usages

Question Paper Pattern

Unit 1 – 40 Marks – Annotations and Questions

Unit 2 – 20 Marks – Questions

B.B.M. / B.B.A. IV Semester

Paper IV

Hindi Natak Aur Anuvad

- Unit 1** : Jana Vijay – Ajit Pushkal
Publishers, Bharatiya Jnanapeeth, New Delhi
- Unit 2** : Vyavaharik Anuvad, Kannada/English – Hindi
Hindi - Kannada/English

Question Paper Pattern

Unit 1 – 40 Marks – Annotations and Questions

Unit 2 – 20 Marks – Passages

DEPARTMENT OF HINDI

**CBCS – NEP Syllabus
(Languages)**

**Hindi – Optional – B.A.
Third Semester**

Paper V – Hindi Sahitya Ka Itihaas-1

Unit 1 : Adi Kaal, Bhakti Kaal and Reeti Kaal

Unit 2 : Hindi Kavya Dhara – Lakshman Prasad Simha
(Vidyapati, Kabir, Surdas, Tulsi, Meera)
Publishers, Loka Bharati Prakashan, Allahabad

Question Paper Pattern

Unit 1 – 30 Marks – Short Notes and Questions

Unit 2 – 30 Marks – Annotations and Questions

Paper VI

Hindi Sahitya Ka Itihas – 2

Unit 1 : Hindi ~~Itihas~~ Sahitya Ka Itihas
Adhunik Kaal – History of Hindi Poetry and Prose

Unit 2 : Smruti Chanda – Agneya
Publishers, Bhartiya Jnanpith, New Delhi

Question Paper Pattern

Unit 1 – 30 Marks – Questions

Unit 2 – 30 Marks – Questions

DEPARTMENT OF HINDI

**CBCS – NEP Syllabus
(Languages)**

**Hindi – Optional – B.A.
Fourth Semester**

Paper VII – Hindi Natya Sahitya

Unit 1 : History of Hindi Natya Sahitya and Ranga Manch

Unit 2 : Andha Yug – Dharmaveer Bharati
Publishers : Kitab Mahal Prakashan, New Delhi

Question Paper Pattern

Unit 1 – 30 Marks – Short Notes and Questions

Unit 2 – 30 Marks – Annotations and Questions

Paper VIII

Hindi Katha Sahitya Ka Itihas

Unit 1 : Upanyas – Subah, Dopahar, Shyam - Kamaleshwar
Publishers, Raj Kamal Prakashan, New Delhi

Unit 2 : Adhunik Hindi Kahaniyan
Publishers, Loka Bharti Prakashan, Allahabad

Question Paper Pattern

Unit 1 – 30 Marks – Short Notes and Questions

Unit 2 – 30 Marks – Short Notes and Questions

2019 →
SYLLABUS.

Department of Hindi

Syllabus for first and second Semester Degree
courses(BA/BSc/BCom/BCA/BBA)

First Semester BA/BSW

Paper 1- Hindi kahani sahitya aur Vyakaran

A. Text- Katha bhoomi

Editor-Chittaranjan mishra

Pulisher-Radhakrishnan Prakashan New Delli

B. Hindi vyakaran

Full Syllabus as per old Syllabus (-semester 1+2)

Question Paper Pattern

A. 40 Marks

B. 20 Marks

2nd Semester

Paper 2-Hindi upanyas aur Bhasha Parichay

A. Text-Mahaboj

Author-Mannu bandari

Publisher- Radhakrishna Prakashan

B. Bhasha Parichay

Language-Defn, Types of Lang, salient features of
lang, Hindi lang-evolution, Hindi kshetr, IMP Dialects
of Hindi.

Question Paper Pattern

A. 40 Marks

B. 20 Marks

Approved Copy

Course-1 Semester BSc

Semester-1

Paper 1-Hindi kahani sahitya aur ghadya lekhan kaushalya

A. Text- Samakalin Hindi Kahaniya

Editor-Hindi Adhyan mandal –Munbhi

Publisher-Radhakrishna Prakashan-New Delli

B. Gadya lekhan

Essays on Current Social and Cultural issues and current
affairs, Précis writing.

Question Paper Pattern

A. 40 Marks

B. 20 Marks

Semester-2

Paper 2-Hindi Kavya sahitya aur Hindi vyakaran

A. Text- Kavya tara

Editor- Badrinath tivari

Publisher-Rajkamal Prakashan-New Delli

B. vyakaran

Full Syllabus as per old Syllabus (-semester 1+2)

Question Paper Pattern

A. 40 Marks

B. 20 Marks

Course –BCOM

Semester-1-

Paper-Hindi kahani sahitya aur vyakaran

A. Text- Adunik Hindi kahani

Editor- Dinish prasad

Publisher-Lokhabharathi Prakashan-Allahabad

B. vyakaran

Full Syllabus as per old Syllabus (-semester 1+2)

Question Paper Pattern

A. 40 Marks

B. 20 Marks

Semester-2

Paper 2-Hindi Gadya sahitya aur Gadya lekhan kaushlya

A. Text- Gadya pulvari

Editor- Shahabuddin shaik

Publisher-Rajpal Prakashan-New Delli

B. Gadya lekhan

Essays on Current Social and Cultural issues and current affairs, Précis writing.

Question Paper Pattern

A. 40 Marks

B. 20 Marks

Course –BCA

Semester-1-

Paper-Hindi Gadya sahitya aur Gadya lekhan kaushlya

A. Text- Gadya Poornima

Publisher-Jagathbharathi Prakashan-Allahabad

B. Gadya lekhan

Essays on Current Social and Cultural issues and current affairs, Précis writing.

Question Paper Pattern

A. 40 Marks

B. 20 Marks

Semester-2

Paper 2-Hindi Kahani sahitya aur Anuvad

A. Text- Abhinava katha bharati

Editor- Chakradhar

Publisher-Sumitra Prakashan- Allahabad.

B. Translation of passages

Question Paper Pattern

A. 40 Marks

B. 20 Marks

Course –BBA\BBM

Semester-1

Paper-Hindi kahani sahitya aur Gadya lekhan kaushlya

A. Text- Kathasaal

Editor- Kumar krisha

Publisher-Vani Prakashan- New delli

B. Gadya lekhan

Essays on Current Social and Cultural issues and current affairs, Précis writing.

Question Paper Pattern

A. 40 Marks

B. 20 Marks

Semester-2

Paper 2-Hindi Gadya sahitya aur Bhasha parichaya

A. Text- Gadya vividha

Editor- Nageshwar singh

Publisher-Jagath bharathi Prakashan- Allahabad.

B. Bhasha Parichay

Language-Defn, Types of Lang, salient features of lang, Hindi lang-evolution, Hindi kshetr, IMP Dialects of Hindi,

Question Paper Pattern

A. 40 Marks

B. 20 Marks

Course –BA (Optional)-DSC/CORE

Semester-1

Paper 1 -Hindi katha sahitya

A. Text 1 – Katha kusum

Editor- Santhosh kumar

Publisher-Lokha bharathi Prakashan- Allahabad.

B. Text 2- Daud

Author- Mamatha kaliya

Publisher- Vani prakashan – New delli.

Question Paper Pattern

A. 30 Marks

B. 30 Marks

Semester-1

Paper 2-Hindi Vyakaran

A. Bhasha aur vyakaran, Hindi vyakaran ka Ithihas

B. Vyakaran (Full Syllabus)

Question Paper Pattern

A. 20 Marks

B. 40 Marks

Semester-2

Paper 3- Adhunik Hindi Kavya Sahitya

A. Text- Kavya kalash

Editor- Vikal Goutham

Publisher-Jagath bharathi Prakashan- Allahabad.

B. Text- Kanu priyaha

Author- Dharm veer bharathi

Publisher- Bharathiya janapeeth Prakashan-Neew Delli.

Question Paper Pattern

A. 30 Marks

B. 30 Marks

Semester-2

Paper 4- Prayojan mulak Hindi

A. Hindi bhasha parichay- Hindi bhasha Ugam aur Vikas,
Hindi bhasha kshetr, IMP Dialects of Hindi,

B. Raj bhasha Hindi- Constitutional Provisions- Article 343
to 351, Raj bhasha adhiniyam 1963, 67, 76.

C. Patr lekhan – Commercial and Government letters

Question Paper Pattern

A. 20 Marks

B. 20 Marks

C. 20 Marks

Course- UG- OPTIONAL ELECTIVE

Semester -1

Paper-1- Samanya Hindi vyakaran aur paryatan Sahitya

A. Text- Are ! Yayavar rahega yaad

Author- Agneya

Publisher- Rajpal prakashan – New delli.

B. Samanya Hindi Vyakaran

Question Paper Pattern

A. 30 Marks

B. 30 Marks

Semester -2

Paper-2- Hindi Bhasha aur Sahitya Parichay

A. Hindi bhasha parichay-

Language-Defn, Types of Lang, salient features of lang, Hindi lang-evolution, Hindi kshetr, IMP Dialects of Hindi.

B. Brief Interdiction to Samakalin Hindi sahitya.

Question Paper Pattern

A. 30 Marks

B. 30 Marks

DEPARTMENT OF HINDI

**CBCS – NEP Syllabus
(Languages)**

B.A. III Semester

Paper III – Hindi Nibandh Sahitya, Patra Lekhan

Unit 1 : Nibandh Vichar Rachana – Vinod Tiwari
Publishers, Loka Bharathi Prakashan, Allahabad

Unit 2 : Patralekhan
Vanijya Patra – Avedan Patra, Pooch-Tach Ke Patra,
Shikayati Patra, Vanijya Paripatra

Sarakari Patra – Samanya Sarakari Patra,
Ardha Sarakari Patra, Paripatra, Press Notes

Question Paper Pattern

Unit 1 – 30 Marks – Annotations and Questions

Unit 2 – 30 Marks – Letter Writing and Short Notes

Paper IV

Adhunik Hindi Sahitya

Unit 1 : Shambooka – Jagadish Gupta

Unit 2 : Samudra Me Khoya Hua Admi – Kamalleshwar
Publishers, Loka Bharti Prakashan, Allahabad

Question Paper Pattern

Unit 1 – 30 Marks – Annotations and Questions

Unit 2 – 30 Marks – Short Notes and Questions

DEPARTMENT OF HINDI

**CBCS – NEP Syllabus
(Languages)**

B.Sc. III Semester

Paper III – Hindi Natak Sahitya Aur Anuvad

- Unit 1** : Komala Gandhara – Shankar Shesh
Publishers, Parameshwari Prakashan, New Delhi
- Unit 2** : Vyavaharik Anuvad, Kannada/English – Hindi
Hindi - Kannada/English

Question Paper Pattern

Unit 1 – 40 Marks – Annotations and Questions

Unit 2 – 20 Marks – Passages

Paper IV

Hindi Upanyas Sahitya, Bhasha Parichaya

Unit 1 : Daud – Mamata Kalia

Unit 2 : Bhasha Parichaya

Question Paper Pattern

Unit 1 – 40 Marks – Short Notes and Questions

Unit 2 – 20 Marks – Short Notes and Questions

DEPARTMENT OF HINDI

**CBCS – NEP Syllabus
(Languages)**

B.C.A. III Semester

Paper III – Hindi Kavya Aur Vyakaran

- Unit 1** : Hindi Kavya Sangraha - Shashi Shekar Tiwari
Publishers, Vani Prakashan, New Delhi
- Unit 2** : Grammar – Nouns, Pronouns, Adjectives, Verbs –
Types and Usages
Linga, Vachana, Karaka, Avyaya - Types and Usages

Question Paper Pattern

Unit 1 – 40 Marks – Annotations and Questions

Unit 2 – 20 Marks – Questions

Paper IV

Hindi Natak Aur Anuvad

- Unit 1** : Ab Gareebi Hatao - Sarveshwar Dayal Saxena
Publishers, Vani Prakashan, New Delhi
- Unit 2** : Vyavaharik Anuvad, Kannada/English – Hindi
Hindi - Kannada/English

Question Paper Pattern

Unit 1 – 40 Marks – Annotations and Questions

Unit 2 – 20 Marks – Passages

DEPARTMENT OF HINDI

**CBCS – NEP Syllabus
(Languages)**

B.Com. III Semester

Paper III – Hindi Kavya Aur Patra Lekhan

- Unit 1** : Kavya Suman – Mahendra Kulasresta
Publishers, Rajpal and Sons, New Delhi
(Poems 6 to 14)
- Unit 2** : Patra Lekhan
Vanijya Patra – Avedan Patra, Pooch-Tach Ke Patra,
Shikayati Patra, Vanijya Paripatra

Sarakari Patra – Samanya Sarakari Patra,
Ardha Sarakari Patra, Paripatra, Press Notes

Question Paper Pattern

Unit 1 – 40 Marks – Annotations and Questions

Unit 2 – 20 Marks – Questions

Paper IV

Hindi Natak Sahitya Aur Prayojanmoolak Hindi

Unit 1 : Ek Aur Dronacharya – Shankar Shesh
Publishers, Parameshwari Prakashan, New Delhi

Unit 2 : Importance of Hindi as Official Language and
Link Language, Constitutional Provisions of
Official Language (Articles 343 to 351)

Question Paper Pattern

Unit 1 – 40 Marks – Annotations and Questions

Unit 2 – 20 Marks – Questions

DEPARTMENT OF HINDI

CBCS – NEP Syllabus
(Languages)

B.B.M. / B.B.A. III Semester

Paper III – Hindi Kavya Aur Vyakaran

- Unit 1** : Hindi Kavya Kunja – Dr. Vishnu Sarvade
Publishers, Rajkamal Prakashan, New Delhi
- Unit 2** : Grammar – Nouns, Pronouns, Adjectives, Verbs –
Types and Usages
Linga, Vachana, Karaka, Avyaya - Types and Usages

Question Paper Pattern

Unit 1 – 40 Marks – Annotations and Questions

Unit 2 – 20 Marks – Questions

Paper IV

Hindi Natak Aur Anuvad

- Unit 1** : Ab Gareebi Hatao - Sarveshwar Dayal Saxena
Publishers, Vani Prakashan, New Delhi
- Unit 2** : Vyavaharik Anuvad, Kannada/English – Hindi
Hindi - Kannada/English

Question Paper Pattern

Unit 1 – 40 Marks – Annotations and Questions

Unit 2 – 20 Marks – Passages

DEPARTMENT OF HINDI

CBCS – NEP Syllabus
(Languages)

Hindi – Optional – B.A.

Paper III – Hindi Sahitya Ka Itihaas

Unit 1 : Adi Kaal, Bhakti Kaal and Reeti Kaal

Unit 2 : Hindi Kavya Dhara – Lakshman Prasad Simha
(Vidyapati, Kabir, Surdas, Tulsi, Meera)
Publishers, Loka Bharati Prakashan, Allahabad

Question Paper Pattern

Unit 1 – 30 Marks – Short Notes and Questions

Unit 2 – 30 Marks – Annotations and Questions

Paper IV

Hindi Natak Sahitya Ka Itihas – 2

Unit 1 : Hindi Natak Sahitya Ka Itihas
Adhunik Kaal – History of Hindi Poetry and Prose

Unit 2 : Smruti Chanda – Agneya
Publishers, Bhartiya Jnanpith, New Delhi

Question Paper Pattern

Unit 1 – 30 Marks – Questions

Unit 2 – 30 Marks – Questions

DEPARTMENT OF HINDI

CBCS – NEP Syllabus
(Languages)

Hindi – Open Elective

Paper III – Samanya Nibandh Lekhan Aur Anuvad Kaushalya

- Unit 1** : Samanya Nibandh Lekhan
Essays on Current Affairs, Environmental, Social Issues
and Literary Topics
- Unit 2** : Anuvad Kaushalya – Anuvad – Definition and Scope
Process, Problems and Evaluation of Translated Passages
Translation of Non-literary Material

Question Paper Pattern

Unit 1 – 30 Marks – Questions

Unit 2 – 30 Marks – Questions

Paper IV

Prayojanmoolak Hindi Aur Patra Lekhan

- Unit 1** : Prayojanmoolak Hindi
Importance of Hindi as Official Language and
Link Language, Constitutional Provisions of
Official Language (Articles 343 to 351)
- Unit 2** : Patralekhan
Vanijya Patra – Avedan Patra, Pooch-Tach Ke Patra,
Shikayati Patra, Vanijya Paripatra
- Sarakari Patra – Samanya Sarakari Patra,
Ardha Sarakari Patra, Paripatra, Press Notes

Question Paper Pattern

Unit 1 – 30 Marks – Questions

Unit 2 – 30 Marks – Questions

LINGUISTICS
THIRD SEMESTER (NEP)

TITLE OF THE COURSE

3.1 SEMANTICS (DSC)

MAIN OBJECTIVES OF THIS COURSE:

The chief aim of the present paper is to equip the students with the major Techniques and Methods of Semantic Analysis and Description. Moreover, to motivates them to understand the basic concepts of Semantics in a proper manner.

PEDAGOGY:

Classroom teaching will be using whiteboard and marker, PowerPoint presentation information and communication technology. One on one interaction or with small student numbers during tutorial classes. Student seminar paper presentation and also the student will be tested for their writing abilities to answer precise and essay type of questions.

COURSE CONTENT

UNIT –I: INTRODUCTION TO SEMANTICS: Definitions, nature and scope, Semantics and Linguistics- relationship between form and meaning; types of meaning; sentence, utterance and proposition;

UNIT – II: BASIC CONCEPTS IN SEMANTICS: reference, sense and denotation; ambiguity and; theories of meaning—referential vs. non referential approaches; generative approach; - Ogden and Richards meaning triangle- Semantic Change, Causes of Semantic change, Linguistic, Historical, Social, Psychological, Taboo, Different Types of Semantic Change, Consequences of Semantic Changes- Pejorative and Ameliorative developments.

UNIT – III: MULTIPLE MEANING: Synonymy - its kinds Complete or Integral, Polysemy – its kinds, Homonymy- its Types-Complete or total and Partial Homonymy, Homophones and Homographs, Antonymy- its kinds,.

BOOKS FOR REFERENCE

- | | | |
|-------------------------------------|------|---|
| ANDREW RADFORD
AND OTHERS | 1999 | Linguistics: An Introduction |
| CRUSE, D., | 1986 | Lexical Semantics |
| FAWLEY, W., | 1992 | Linguistic Semantics |
| KATZ FODOR | 1964 | Structure of Language |
| LEHRER, A., | 1974 | Semantic Fields and Lexical Structure |
| LEHRER, A.,
AND KEITH LEHRER | 1970 | Theory of Meaning |
| LEECH, GEOFFREY | 1981 | Semantics |
| LYON JOHN | 1977 | Semantics Vol. 1 & 2. |
| NIDA, E.A., | 1974 | Componential Analysis |
| OGDEN, C.K.,
AND RICHARDS, I.A., | 1966 | The Meaning of Meaning |
| PALMER, F.R., | 1981 | Semantics |
| SCHIFFER, S., | 1988 | Meaning |
| STREIN, G., | 1965 | Meaning and Change of Meaning |
| STEINBERG AND JACOBVITS, | 1971 | Semantics – An Interdisciplinary Reader |
| VARMA, S.K., &
KRISHNASWAMY, N., | 1989 | Modern Linguistics: An Introduction, Oxford
University Press, NEWDELHI |
| ULLMAN, S., | 1959 | The Principles of Semantics |
| | 1964 | Semantics – An Introduction to the Science of Meaning |

COURSE OUTCOMES:

At the end of the course, the students will be able to

1. Have insight into basic issues of linguistic semantics, including how linguistic expressions related to entities in the world, meaning relations between linguistic expressions, and the relation between meaning and truth.
2. Understand how and why language differs from other communication systems, and how language is employed to communicate various types of meaning.
3. Describe and analyze how people handle and exploit various semantic and pragmatic phenomena in everyday communication.

3.2 HISTORICAL LINGUISTICS (DSC)

MAIN OBJECTIVES OF THIS COURSE:

The present Course has been designed to provide a) An outline methods of Historical Linguistics b) A study of Historical Linguistics to lead one to understanding the general trends of change in Human Language in course of time. In addition, to teach an outline of modern methods of comparative study of languages .The present study of comparative linguistics leads one to understand the general trends of change in related languages.

COURSE PEDAGOGY:

Classroom teaching will be using whiteboard and marker, PowerPoint presentation information and communication technology. One on one interaction or with small student numbers during tutorial classes. Student seminar paper presentation and also the student will be tested for their writing abilities to answer precise and essay type of questions.

COURSE CONTENT :

UNIT –I : INTRODUCTION: Synchronic and diachronic approaches to Language; use of written records for historical studies; language classification; notion of language family. Criteria for identifying family relationships among languages; definition of the word cognate; language isolates; criteria for typological classification – agglutinative, inflectional, analytic, synthetic and polysynthetic; basic word order typology-SVO, SOV, etc.

UNIT –II : LINGUISTIC CHANGE: Sound changes; Neogrammarian theory; genesis and various types of regularity and spread of sound change, phonetic and phonemic change; split and merger, grammatical change, semantic change; lexical diffusion of sound change; : Linguistic borrowing-lexical and structural; motivation-Prestige and need; Classification of loan words-loan translation, loan blend, calques, assimilated and unassimilated loans.

UNIT –III : RECONSTRUCTION: reconstructing the proto-stage of languages, internal reconstruction and comparative method- their scope and limitations, innovation and retention; sub grouping within a family; family tree and wave models

References:

- Antilla, R.1972 **An Introduction to Historical & Comparative Linguistics**; New York; Macmillan.
- Bhat, D.N.S. 1972 **Sound Change**; Poona; Poona Bhasha Prakashan.
- Brian D. Joseph, Richard D. Janda (eds.) 2003. **The Handbook of Historical Linguistics**. Oxford: Blackwell.
- Bynon, T. 1977 **Historical Linguistics**; CUP.
- Campbell, Lyle. 2004. **Historical Linguistics: An Introduction**. Massachusetts: MIT Press.
- Hoenigswald, H.M 1960 **Language Change & Linguistic Reconstruction**. Chicago: Chicago Univ. Press.
- Hitchcock, C. 1998. **The Common Cause Principle in Historical Linguistics Philosophy of Science**, Vol. 65, No. 3 (Sep., 1998), pp. 425-447.
- Hons Henric Hock. **Principles of historical linguistics**. Mouton De Gruyter.
- Lehman, W.P 1962 **Historical Linguistics- An Introduction**; New York: Holt Rinchart & Winston.
- Karumuri V Subbarav. 2012. **South Asian Languages A Syntactic Typology**. Cambridge.

COURSE OUTCOMES:

1. At the end of the course, the students will be able to understand methods of Historical Linguistics and to the general trends of change in Human Language in course of time.
2. apply the techniques of reconstruction to language samples
3. explore the social and linguistic motivations for language change

3.3 Practical Translation and Professional Communication Skills (OEC)

MAIN OBJECTIVES OF THIS COURSE:

The main aim of this course is primarily intended to make the students aware of the Linguistic approach to language and translation. Hence, unique elementary concepts of Practical Translation and an overview on the subject practical translation briefly mentioned in this course. And also to introduce them to the various practical aspects of Translation.

COURSE PEDAGOGY:

Classroom teaching will be using whiteboard and marker, PowerPoint presentation information and communication technology. One on one interaction or with small student numbers during

tutorial classes. Student seminar paper presentation and also the student will be tested for their writing abilities to answer precise and essay type of questions.

COURSE CONTENT:

1. Journalism Domain

- . A Piece of editorial writing
- a. A report on Politics
- b. A piece on sports report
- c. Readers' letter to editor
- d. A piece of Special report

2. Science, Technology, Health

- . Computer related text
- a. Food recipe
- b. A text related to insurance
- c. A Popular write up on health Particularly diet
- d. A write up on scientific writing that appeared in daily

3. Audio-visual materials

- . Ted talks (Related to any topic)
- a. Ted talks (Related to any topic)
- b. Ted talks (Related to any topic)
- c. A piece of you tube conversation (visual scene)
- d. Writing sub titles for a small documentary or short movie

4. Business domain

- . Boucher
- a. Advertisements (one/two)
- b. A part of manuals
- c. A piece of invitation
- d. A piece of pamphlet

5. Creative writings

- . Short poems (Shayiri / Dohe/ Haiku/ vachana)
- a. Children's poems (nursery rhymes)
- b. Short Stories
- c. Discursive writings(Ted talks)
- d. Biopics

BOOKS FOR REFERENCE

HALLIDAY, M.A.K. (ET AL). 1964 *The linguistic science and language teaching.*,
Longman London:

Holmes, James S. (1988b/2004) 'The name and nature of translation studies',
in Lawrence Venuti (ed.) (2004), *The Translation Studies Reader*, 2nd edition,
pp. 180–92.

Jakobson, Roman (1959/2004) 'On linguistic aspects of translation', in Lawrence
JODY BYRNE, 2006 *Technical Translation Usability Strategies for Translating Technical
Documentation University of Sheffield, UK*
Venuti (ed.) (2004), *The Translation Studies Reader*, 2nd edition, pp. 138–43.

Snell-Hornby, Mary (2006) *The Turns of Translation Studies*, Amsterdam and
Philadelphia: John Benjamins, Chapter 1 .

van Doorslaer, Luc (2007) 'Risking conceptual maps', in Yves Gambier and Luc
van Doorslaer (eds) *The Metalanguage of Translation*, special issue of *Target*
19.2:217–33.

VERMA, S.K., & 1989 *Modern Linguistics: An Introduction*, Oxford
KRISHNASWAMY, N., University Press, NEWDELHI

WIDDOWSON, H.G. 1978 *Teaching language as communication*. Oxford: OUP.

COURSE OUTCOMES :

At the end of the course, the students will be able to

1. To know various unique elementary concepts of practical translation.
2. To introduce them to the various areas of Applied Linguistics.
3. To have an understanding of the key concepts in Translation Studies and be able to appreciate the interdisciplinary nature of Applied Linguistics.
4. To identify an area within the field of Applied Linguistics for further research

**LINGUISTICS
IV SEMESTER**

TITLE OF THE COURSE

4.1 Pragmatics (DSC)

MAIN OBJECTIVES OF THIS PAPER:

To provide an introduction and background of pragmatics and to deal pragmatics under the light of sociolinguistics. To understand the background of the current research in Linguistics and Philosophy

COURSE PEDAGOGY :

Classroom teaching will be using whiteboard and marker, PowerPoint presentation information and communication technology. One on one interaction or with small student numbers during tutorial classes. Student seminar paper presentation and also the student will be tested for their writing abilities to answer precise and essay type of questions.

COURSE CONTENT :

UNIT I PRAGMATICS: Relationship between semantics and pragmatics Language Use in Context Model of Communication: Message Model and Inferential Model, Speech Acts ,Conversational Implicature and Grice's Maxims. Deixis and its types.

UNIT –II SENTENCE MEANING: Sentence and proposition, predicates, arguments and their participant roles, connectiveness, statements, contradictions, questions and variables, presupposition and focus, logical presupposition and entailment, truth value of propositions, paraphrase relations, analytical meaning of sentences.

UNIT –III PRAGMATIC MEANING: Speech act analysis, illocutionary and precautionary acts, sincerity condition, conversational implicature, universe of discourse; social meaning of utterances, politeness and such other variables.

References:

- Aijmer & Wichmann. 2012. Pragmatics. Routledge : London.
- Austin, J.L. 1962. (2nd ed. 1975). **How to do things with words.** Oxford: clarendon Press.
- Berlin, . and Paul Kay. 1969. **Basic colour terms : Their Universality and Evolution.** Berkeley University of California Press
- Chierchia, Gennaro and Sally McConnell-Ginet 2000. **Meaning and Grammar: An introduction to Semantics.** (Second Edition) Cambridge, Mass: MIT Press.
- Davidson, Donald, 1984. **Inquiries into truth and interpretation.** Oxford: **Oxford University Press.**

Grice, H.P. 1978. "Further Notes on Logic and Conversation", in Peter Cole and Jeny Morgan (eds.) **Syntax and Semantics**, Vol. 9: **Pragmatics**, 113-28. New York: Academic Press.

Hurford, James R. and Brendan Heasley. 1983. **Semantics: A Course Book**. Cambridge University Press.

Jackendoff, Ray. 1990. **Semantic Structure**. Cambridge, Mass: MIT Press.

Lakoff, George and Mark Johnson, 1980. **Metaphors we live by**. Chicago: University Press of Chicago Press.

Lappin, S. (ed). 1997. **The Handbook of Contemporary Semantic Theory**. Blackwell.

Levinson, Stephen C. 1983. **Pragmatics**. Cambridge: CUP Archer, dawn;

Leech, Geoffrey N. 1981. (rev. ed. 1994). **Semantics**. Penguin.

Levinson, Stephen C. 2000. **Presumptive meanings: the theory of generalized conversational implicature**. Cambridge, Mass: Press.

Lyons, J. 1997. **Semantics Vol 1 & 2**. Cambridge University Press.

Pustejovsky, James (ed.) 1993. **Semantics and the Lexicon**. Dordrecht: Kluwer.

Saeed, John I. 1997. **Semantic**. London: Blackwell.

Searle, John. 1969. **Speech Acts**. Cambridge University Press. CUP

4.2 Sociolinguistics (DSC)

MAIN OBJECTIVES OF THIS PAPER:

The main objective of this paper is to provide the basic information of Language, Society and Culture.. It helps to understand the relationship between Language, Society and Culture. It also helps to understand the Social attitudes of the Language

COURSE PEDAGOGY :

Classroom teaching will be using whiteboard and marker, PowerPoint presentation information and communication technology. One on one interaction or with small student numbers during tutorial classes. Student seminar paper presentation and also the student will be tested for their writing abilities to answer precise and essay type of questions.

COURSE CONTENT:

UNIT –I Definition, Concepts and Frameworks: Defining sociolinguistics, subject matter of sociolinguistics, sociolinguistics and sociology of language, macro and micro sociolinguistics, defining speech community, verbal and speech repertoire, restricted and elaborated codes, verbal deficit hypothesis.

UNIT –II Multilingualism and language contact: Bilinguals and bilingualism code-switching and mixing, language maintenance, shift and death, pidgin and creole, lingua franca, language loyalty, attitudes. Types of Linguistic variation: standard, non-standard, social, regional and stylistic, diagglossia.

UNIT –III Sociolinguistics of Interaction: Communicative competence: ethnography of speaking, power and solidarity, linguistic politeness, intercultural communication, pronouns of power and solidarity, address terms.

Reading list:

References:

- Coupland, N. Sarangi, S. and Candlin, C.N. (Eds.) 2001. *Sociolinguistics and Social Theory*. Harlow, England: Longman.
- Coupland, N. and A. Jaworski (eds) 2009. *The New Sociolinguistic Reader*. Basington, UK, New York: Palgrave Macmillan.
- Chambers, J.K. 2003. *Sociolinguistic Theory: Linguistic Variation and its Social Significance*. Oxford: Blackwell.
- Coupland, Nikolas and Jaworski, Adam (eds.) 1997 *Sociolinguistics: A Reader and Coursebook*. Basingstoke: Macmillan
- Dittmar, N. 1976. *Foundations in sociolinguistics*. London: Edward Arnold.
- Fasold, Ralph 1984. *The Sociolinguistics of Society*. Oxford: Blackwell
- Fasold, Ralph 1990. *The Sociolinguistics of Language*. Oxford: Blackwell
- Fishman, Joshua, (ed.) 1968. *Readings in the Sociology of Language*. The Hague: Mouton.
- Holmes Janet 2001. *An Introduction to Sociolinguistics*. London: Longman.
- Hymes, D. 1974. *Foundations in sociolinguistics: An ethnographic approach*. Philadelphia: University of Pennsylvania Press.
- Labov, William, 2006. *Social Stratification Language in New York City*. Cambridge: CUP.
- Meyerhoff, Miriam, 2006, *Introducing Sociolinguistics*, London and New York: Routledge
- Romaine, Susan, 1995, *Bilingualism*, Oxford: Blackwell
- Stockwell, P. 2007. *Sociolinguistics: A resource book for students*. London & New York: Routledge.
- Trudgill, Peter and CHESHIRE, Jenny (eds.) 1998 *The Sociolinguistics Reader. Volume 1: Multilingualism and Variation*. London: Arnold.
- Trudgill, Peter. 1974. *Sociolinguistics*. Harmondsworth: Penguin.
- Wardhaugh, Ronald 1997. *An Introduction to Sociolinguistics*. Oxford: Blackwell.

COURSE OUTCOMES :

At the end of the course, the students will be able to

1. Relate the social variables and linguistic variables
2. Describe the interdependence of language and society
3. Identify the language varieties and Understand language attitudes

4.3 Language and Media (OEC)

MAIN OBJECTIVES OF THIS PAPER:

To provide background of complexities of human language and to explore elements of language structure in relation to media. To understand the relationship between language form, and meaning, language variation, and to trace the interrelationship between linguistics, media and other disciplines.

COURSE PEDAGOGY :

Classroom teaching will be using whiteboard and marker, PowerPoint presentation information and communication technology. One on one interaction or with small student numbers during tutorial classes. Student seminar paper presentation and also the student will be tested for their writing abilities to answer precise and essay type of questions.

COURSE CONTENT :

UNIT I: Linguistics and Media Language use in print media; language in advertising; language in TV and cinema; political discourse; language and empowerment

UNIT II: Media: The Semiotic Approach Sign systems, Components of the Sign, Verbal and Non-verbal Signs, Sequence of Linguistic Signs, Visual Signs, Denotation, Connotation and Myth, Myth and Social Meanings, Myth and Ideology.

UNIT III: The Advertising Business, Ideology in Ads, Ideology of Ads, The Semiotic Critique of Ads, Decoding Advertisements.

UNIT IV: Television Signs and Codes, Television Narrative and Ideology, Viewers' Involvement and positioning, Polysemic Television and Multiaccentuality.

UNIT V: Cinema Cinematic Semiosis: Film signs and codes, Film narrative, Film Genre, Cinema Spectatorship.

BOOKS FOR REFERENCE

- Abdusatarov, R. K. (2021). ON MASS MEDIA AND STATE LANGUAGE. *CURRENT RESEARCH JOURNAL OF PHILOLOGICAL SCIENCES*, 02(08), 4–8. <https://doi.org/10.37547/philological-crjps-02-08-02>
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- HIRSCH, P. M. (1992). Globalization of Mass Media Ownership. *Communication Research*, 19(6), 677–681. <https://doi.org/10.1177/009365092019006001>
- Kalinina, M. V. (2018a). LANGUAGE ECOLOGY. BORROWINGS IN MASS MEDIA. *Bulletin of the South Ural State University series Linguistics*, 15(2), 43–47. <https://doi.org/10.14529/ling180208>
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- Mudliar, P.R. (2008). Language of Advertisement in Hindi Mass Media. *Journal of Indian Studies*, 13(1), 319–344. <https://doi.org/10.21758/jis.2008.13.1.319>
- Potter, W. J. (2011). Conceptualizing Mass Media Effect. *Journal of Communication*, 61(5), 896–915. <https://doi.org/10.1111/j.1460-2466.2011.01586.x>
- Simonson, P. (1997). Mass Media and Religion. *Journal of Communication*, 47(2), 140–143. <https://doi.org/10.1111/j.1460-2466.1997.tb02711.x>
- 한성우. (2008). Mass Media Language and Phonological Research. *EOMUNYEONGU*, 58(11), 137–160. <https://doi.org/10.17297/rsll.2008.58..006>

COURSE OUTCOMES:

At the end of the course, the students will be able to

1. To analyze communication in a practical way in the field of media
2. To understand the linguistics relationship with media studies and other fields
3. To apply linguistic knowledge to the field of media and media studies.

**Syllabus for B.A./B.Sc. with Mathematics as Major Subject &
B.A./B.Sc. (Hons) Mathematics**

SEMESTER – I

MATDSCT 1.1: Algebra - I and Calculus - I	
Teaching Hours : 4 Hours/Week	Credits: 4
Total Teaching Hours: 56 Hours	Max. Marks: 100 (S.A.-60 + I.A. – 40)

Course Learning Outcomes: This course will enable the students to

- Learn to solve system of linear equations.
- Solve the system of homogeneous and non homogeneous linear of m equations in n variables by using concept of rank of matrix, finding Eigen values and Eigen vectors.
- Sketch curves in Cartesian, polar and pedal equations.
- Students will be familiar with the techniques of integration and differentiation of function with real variables.
- Identify and apply the intermediate value theorems and L'Hospital rule.

Unit-I: Matrix: Recapitulation of Symmetric and Skew Symmetric matrices, Cayley- Hamilton theorem, inverse of matrices by Cayley-Hamilton theorem (Without Proof). Algebra of Matrices; Row and column reduction to Echelon form. Rank of a matrix; Inverse of a matrix by elementary operations; Solution of system of linear equations; Criteria for existence of non-trivial solutions of homogeneous system of linear equations. Solution of non-homogeneous system of linear equations. Eigen values and Eigen vectors of square matrices, real symmetric matrices and their properties, reduction of such matrices to diagonal form,

14 Hours

Unit-II: Polar Co-ordinates: Polar coordinates, angle between the radius vector and tangent. Angle of intersection of two curves (polar forms), length of perpendicular from pole to the tangent, pedal equations. Derivative of an arc in Cartesian, parametric and polar forms, curvature of plane curve-radius of curvature formula in Cartesian, parametric and polar and pedal forms- center of curvature, asymptotes, evolutes and envelops.

14 Hours

Unit-III: Differential Calculus-I: Limits, Continuity, Differentiability and properties. Properties of continuous functions. Intermediate value theorem, Rolle's Theorem, Lagrange's Mean Value theorem, Cauchy's Mean value theorem and examples. Taylor's theorem, Maclaurin's series, Indeterminate forms and evaluation of limits using L'Hospital rule.

14 Hours

Unit-IV: Successive Differentiation: n th Derivatives of Standard functions e^{ax+b} , $(ax + b)^n$, $\log(ax + b)$, $\sin(ax + b)$, $\cos(ax + b)$, $e^{ax} \sin(bx + c)$,

$e^{ax} \cos(bx + c)$, Leibnitz theorem and its applications. Tracing of curves (standard curves) **14 Hours**

Reference Books:

1. University Algebra - N S Gopala Krishnan, New Age International (P) Limited.
2. Theory of Matrices - B S Vatsa, New Age International Publishers.
3. Matrices - A R Vasista, Krishna Prakashana Mandir.
4. Differential Calculus - Shanti Narayan, S. Chand & Company, New Delhi.
5. Applications of Calculus, Debasish Sengupta, Books and Allied (P) Ltd., 2019.
6. Calculus – Lipman Bers, Holt, Rinehart & Winston.
7. Calculus - S Narayanan & T K Manicavachogam Pillay, S Viswanathan Pvt. Ltd., vol. I & II.
8. Schaum's Outline of Calculus - Frank Ayres and Elliott Mendelson, 5th ed. USA: Mc. Graw.

MATDSCP 1.1: Practical's on Algebra - I and Calculus – I	
Practical Hours : 4 Hours/Week	Credits: 2
Total Practical Hours: 56 Hours	Max. Marks: 50 (S.A.-30 + I.A. – 20)

Course Learning Outcomes: This course will enable the students to

- Learn *Free and Open Source Software (FOSS)* tools for computer programming.
- Solve problem on algebra and calculus theory studied in **MATDSCP 1.1** by using FOSS softwares.
- Acquire knowledge of applications of algebra and calculus through FOSS.

Practical/Lab Work to be performed in Computer Lab (FOSS)

Suggested Softwares: Maxima/Scilab/Maple/MatLab/Mathematica/Python/R.

Introduction to the software and commands related to the topic.

1. Computation of addition and subtraction of matrices.
2. Computation of Multiplication of matrices.
3. Computation of Trace and Transpose of Matrix.
4. Computation of Rank of matrix and Row reduced Echelon form.
5. Computation of Inverse of a Matrix using Cayley-Hamilton theorem.
6. Solving the system of homogeneous and non-homogeneous linear algebraic equations.
7. Finding the nth Derivative of e^{ax} , trigonometric and hyperbolic functions.
8. Finding the nth Derivative of algebraic and logarithmic functions.
9. Finding the nth Derivative of $e^{ax} \sin(bx + c)$, $e^{ax} \cos(bx + c)$.

10. Finding the Taylor's and Maclaurin's expansions of the given functions.
11. Finding the angle between the radius vector and tangent.
12. Finding the curvatures of the given curves.
13. Tracing of standard curves.

Open Elective Course

(For students of Science stream who have not chosen Mathematics as one of Core subjects)

MATOET 1.1: Basic Mathematics - I	
Teaching Hours : 3 Hours/Week	Credits: 3
Total Teaching Hours: 42 Hours	Max. Marks: 100 (S.A.-60 + I.A. – 40)

Course Learning Outcomes: This course will enable the students to

- Learn to solve system of linear equations.
- Solve the system of homogeneous and non homogeneous m linear equations by using the concept of rank of matrix, finding Eigen values and Eigen vectors.
- Students will be familiar with the techniques of differentiation of function with real variables.
- Identify and apply the intermediate value theorems and L'Hospital rule.
- Learn to trace some standard curves.

Unit-I: Matrices: Recapitulation of Symmetric and Skew Symmetric matrices, Cayley- Hamilton theorem, inverse of matrices by Cayley-Hamilton theorem (Without Proof). Algebra of Matrices; Row and column reduction, Echelon form. Rank of a matrix; Inverse of a matrix by elementary operations; Solution of system of linear equations; Criteria for existence of non-trivial solutions of homogeneous system of linear equations. Solution of non-homogeneous system of linear equations. Eigen values and Eigen vectors of square matrices, real symmetric matrices and their properties, reduction of such matrices to diagonal form.

14 Hours

Unit-II: Differential Calculus: Limits, Continuity, Differentiability and properties. Intermediate value theorem, Rolle's Theorem, Lagrange's Mean Value theorem, Cauchy's Mean value theorem and examples. Taylor's theorem, Maclaurian's series, Indeterminate forms and examples.

14 Hours

Unit-III: Successive Differentiation: nth Derivatives of Standard functions e^{ax+b} , $(ax + b)^n$, $\log(ax + b)$, $\sin(ax + b)$, $\cos(ax + b)$, $e^{ax} \sin(bx + c)$, $e^{ax} \cos(bx + c)$, Leibnitz theorem and its applications. Tracing of curves (standard curves)

14 Hours

Reference Books:

1. University Algebra - N.S. Gopala Krishnan, New Age International (P) Limited
2. Theory of Matrices - B. S. Vatsa, New Age International Publishers.
3. Matrices – A. R. Vasista, Krishna Prakashana Mandir.
4. Applications of Calculus, Debasish Sengupta, Books and Allied (P) Ltd., 2019.
5. Differential Calculus - Shanti Narayan, S. Chand & Company, New Delhi.
6. Calculus – Lipman Bers, Holt, Rinehart & Winston.
7. Calculus – S. Narayanan & T. K. Manicavachogam Pillay, S. Viswanathan Pvt. Ltd., vol. I & II.
8. Schaum's Outline of Calculus - Frank Ayres and Elliott Mendelson, 5th ed. USA: Mc. Graw.

Open Elective**(For Students of other than Science Stream)**

MATOE 1.1(B): Business Mathematics-I	
Teaching Hours : 3 Hours/Week	Credits: 3
Total Teaching Hours: 42 Hours	Max. Marks: 100 (S.A.- 60 + I.A. – 40)

Course Learning Outcomes: This course will enable the students to

- Translate the real word problems through appropriate mathematical modelling.
- Explain the concepts and use equations, formulae and mathematical expression and relationship in a variety of context.
- Finding the extreme values of functions.
- Analyze and demonstrate the mathematical skill require in mathematically intensive areas in economics and business.

Unit-I: Algebra – Set theory and simple applications of Venn Diagram, relations, functions, indices, logarithms, permutations and combinations. Examples on commercial mathematics.

14 Hours

Unit - II: Matrices: Definition of a matrix; types of matrices; algebra of matrices. Properties of determinants; calculations of values of determinants upto third order; Adjoint of a matrix, elementary row and column operations; solution of a system of linear equations having unique solution and involving not more than three variables. Examples on commercial mathematics.

14 Hours

Unit - III: Differential Calculus: Constant and variables, functions, Limits &

continuity. Differentiability and Differentiation, partial differentiation, rates as a measure, maxima, minima, Partial Derivatives up to second order; Homogeneity of functions and Euler's Theorem; Total Differentials; Differentiation of implicit function with the help of total differentials, Maxima and Minima; cases of one variable involving second or higher order derivatives; Cases of two variables involving not more than one constraint.

14 Hours

Reference Books:

1. Basic Mathematics, Allel R.G.A, Macmillan, New Delhi.
2. Mathematics for Economics, Dowling, E.T. , Schaum's Series, McGraw Hill, London.
3. Quantitative Techniques in Management, Vohra, N.D., Tata McGraw Hill, New Delhi.
4. Business Mathematics, Soni R.S., Pitamber Publishing House, Delhi

Open Elective: MATOE 1.1(C): Competitive Mathematics-I:

MATOE 1.1(C): Competitive Mathematics-I	
Teaching Hours : 3 Hours/Week	Credits: 3
Total Teaching Hours: 42 Hours	Max. Marks: 100 (S.A.- 60 + I.A. – 40)

UNIT-I: Series: NUMBER SERIES: Number series tests present numerical sequences that follow a logical rule which is based on elementary arithmetic. An initial sequence is given from which the rule is to be deduced, predict the next number that obeys the rule. ALPHABET SERIES: Under this series letter will be coded or arranged in some pattern, normally based on the position of the letters. CONTINUOUS PATTERN SERIES: These types of questions usually consist of a series of small letters of the small letters which follow a certain pattern. However, some letters are missing from the series. These missing letters are then given in a proper sequence as of alternatives. **14 Hours**

UNIT-II: Alphabet Test: ALPHABETICAL ORDER: Arranging words in alphabetical order implies to arrange them in the order as they appear in a dictionary that is as per the order in which the beginning letters of the words appear in the English alphabet. ALPHABETICAL QUIBBLE: In this type of questions generally a letter series is given, be it the English alphabets from A to Z or a randomized sequence of letters. The candidate is then required to trace the letters satisfying certain given conditions as regard their position in the given sequence or the sequence obtained by performing certain given operations on the given sequence. **14 Hours**

UNIT-III: Coding and Decoding: CODE is ‘a system of signals’. Coding is, therefore a method of transmitting a message between sender and receiver which cannot be understood or comprehended by a third person. The coding - decoding test is set up to judge a candidates ability to decipher to particular word/message and break the court to decipher the message. In coding, actual alphabet/words/terms/numbers are replaced by certain other alphabets/ words/number/symbols etc. according to a certain rule to solve this type of questions we have to detect the rule and then answer the questions. Decoding is the method to find the meaning of something that has written in code. **14 Hours**

UNIT-IV: Numbers and Ranking: Number test: In this type of question, generally a set, group or series of numeral is given and the candidate is required to find how many times a number satisfies the conditions specified in the question occurs. Ranking test: Generally, a number of questions are arranged in either ascending or descending order of their performance in a certain activity. **14 Hours**

References:

1. Quantitative aptitude for competitive exam, R.S .Aggarwal exam series 2020 book by Dr.R.S .Aggarwal and Abhijit Guha.
2. Quantitative Aptitude Quantum for CAT, II Edition, PHI Learning Pvt. Ltd. Delhi, by Abhijit Guha.
3. GMAT Volume 1 and 2, Ignus Power Education Publication
4. Faster Track Objective Arithmetic (Revised Edition), Arihant Publications by Rajesh Verma

Open Elective: MATOE 1.1(D): Mathematical Modelling-I:

MATOE 1.1(D): - Mathematical Modelling I	
Teaching Hours : 3 Hours/Week	Credits: 3
Total Teaching Hours: 42 Hours	Max. Marks: 100 (S.A.- 60 + I.A. – 40)

Unit-I: Mathematical Modelling: Need, Techniques, Classification and Simple Illustrations, Simple Situations Requiring Mathematical Modelling. The Technique of Mathematical Modelling. Classification of Mathematical Models. Some Characteristics of Mathematical Models. **14 Hours**

Unit-II: Mathematical Modelling: Need, Techniques, Classification and Simple Illustrations: Mathematical Modelling through Geometry. Mathematical Modelling

through Algebra. Mathematical Modelling through Trigonometry. Mathematical Modelling through Calculus. **14 Hours**

Unit-III: Mathematical Modelling Through Ordinary Differential Equations of First Order: Mathematical Modelling through Differential Equations, Effect of Immigration and emigration on population size, Linear Growth and Decay Models, Non-Linear Growth and Decay Models. **14 Hours**

Unit 4: Mathematical Modelling Through Ordinary Differential Equations of First Order: Compartment Models, Mathematical Modelling in Dynamics through Ordinary Differential Equations of First Order, Mathematical Modelling of Geometrical Problems through Ordinary Differential Equations of First Order. **14 Hours**

References:

1. Mathematical Modelling - J. N. Kapur, New Age International Private Limited.
2. An Introduction to Mathematical Modelling - Edward A Bender published, Dover Books on Computer Science
3. Mathematical Modelling with Case Studies: Using Maple and MATLAB, Third edition -B. Barnes, G.R. Fulford, CRC Press, Taylor and Francis Group
4. An Introduction to Mathematical Modelling by Michael Alder HeavenForBooks.com

SEMESTER – II

MATDSCT 2.1: Algebra - II and Calculus - II	
Teaching Hours : 4 Hours/Week	Credits: 4
Total Teaching Hours: 56 Hours	Max. Marks: 100 (S.A.-60 + I.A. – 40)

Course Learning Outcomes: This course will enable the students to

- Recognize the mathematical objects called Groups.
- Link the fundamental concepts of groups and symmetries of geometrical objects.
- Explain the significance of the notions of Cosets, normal subgroups and factor groups.
- Understand the concept of differentiation and fundamental theorems in differentiation and various rules.
- Find the extreme values of functions of two variables.

Unit-I: Real Number System: Recapitulation of number system. Countable and uncountable sets, standard theorems. Real line, bounded sets, supremum and infimum of a set, completeness properties of R , Archimedean property of R . Intervals, neighborhood of a point, open sets, closed sets, limit points and Bolzano-Weierstrass theorem (Without proof)

14 hours

Unit-II: Groups: Definition of a group with examples and properties, congruence, problems. Subgroups, center of groups, order of an element of a group and its related theorems, cyclic groups, Coset decomposition, Factor groups, Lagrange's theorem and its consequences. Fermat's theorem and Euler's ϕ function.

14 hours

Unit-III: Partial Derivatives: Functions of two or more variables-explicit and implicit functions, partial derivatives. Homogeneous functions- Euler's theorem, total derivatives, differentiation of implicit and composite functions, Jacobians and standard properties and illustrative examples. Taylor's and Maclaurin's series for functions of two variables, Maxima-Minima of functions of two variables.

14 hours

Unit-IV: Integral Calculus: Recapitulation of definite integrals and its properties. *Line integral:* Definition of line integral and basic properties, examples on evaluation of line integrals. *Double integral:* Definition of Double integrals and its conversion to iterated integrals. Evaluation of double integrals by changing the order of integration and change of variables. Computation of plane surface areas,

volume underneath a surface of revolution using double integral. *Triple integral*: Definition of triple integrals and evaluation-change of variables, volume as triple integral. Differentiation under the integral sign by Leibnitz rule.

14 hours

Reference Books:

1. Topics in Algebra, I N Herstein, Wiley Eastern Ltd., New Delhi.
2. Higher algebra, Bernard & Child, Arihant, ISBN: 9300943199/ 9789300943199.
3. Modern Algebra, Sharma and Vasista, Krishna Prakashan Mandir, Meerut, U.P.
4. Differential Calculus, Shanti Narayan, S. Chand & Company, New Delhi.
5. Integral Calculus, Shanti Narayan and P K Mittal, S. Chand and Co. Pvt. Ltd.,
6. Schaum's Outline Series, Frank Ayres and Elliott Mendelson, 5th ed.
USA: Mc. Graw Hill., 2008.
7. Mathematical Analysis, S C Malik, Wiley Eastern.
8. A Course in Abstract Algebra, Vijay K Khanna and S K Bhambri,
Vikas Publications.
9. Text Book of B.Sc. Mathematics, G K Ranganath, S Chand & Company.

PRACTICAL

MATDSCP 2.1: On Algebra -II and Calculus - II	
Practical Hours : 4 Hours/Week	Credits: 2
Total Practical Hours: 56 Hours	Max. Marks: 50 (S.A.-30 + I.A. – 20)

Course Learning Outcomes: This course will enable the students to

- Learn *Free and Open Source Software (FOSS)* tools for computer programming
- Solve problem on algebra and calculus by using FOSS software's.
- Acquire knowledge of applications of algebra and calculus through FOSS

Practical/Lab Work to be performed in Computer Lab

Suggested Software's: Maxima/Scilab/Maple/MatLab/Mathematica/Python/R.

1. Program for verification of binary operations.
2. Program to construct Cayley's table and test Abelian for given finite set.
3. Program to find all possible cosets of the given finite group.
4. Program to find generators and corresponding possible subgroups of a cyclic group.

5. Programs to verification of Lagrange's theorem with suitable examples.
6. Program to verify the Euler's ϕ function for a given finite group.
7. Program to verify the Euler's theorem and its extension.
8. Programs to construct series using Maclaurin's expansion for functions of two variables.
9. Program to evaluate the line integrals with constant and variable limits.
10. Program to evaluate the Double integrals with constant and variable limits.
11. Program to evaluate the Triple integrals with constant and variable limits.
12. Program to evaluate volume using triple integral.

Open Elective

(For students of Science stream who have not chosen Mathematics as one of the Core subjects)

MATOET 2.1(A): Basic Mathematics – II	
Teaching Hours : 3 Hours/Week	Credits: 3
Total Teaching Hours: 42 Hours	Max. Marks: 100 (S.A.- 60 + I.A. – 40)

Course Learning Outcomes: This course will enable the students to

- Recognize the mathematical objects called Groups.
- Link the fundamental concepts of groups and symmetries of geometrical objects.
- Explain the significance of the notions of Cosets, normal subgroups and factor groups.
- Understand the concept of differentiation and fundamental theorems in differentiation and various rules.
- Find the extreme values of functions of two variables.
- To understand the concepts of multiple integrals and their applications.

Unit-I: Groups: Definition of a group with examples and properties, congruence, problems. Subgroups, center of groups, order of an element of a group and its related theorems, cyclic groups, Coset decomposition, Factor groups, Lagrange's theorem and its consequences. Fermat's theorem and Euler's ϕ function. **14 hours**

Unit-II: Partial Derivatives: Functions of two or more variables-explicit and implicit functions, partial derivatives. Homogeneous functions- Euler's theorem, total derivatives, differentiation of implicit and composite functions, Jacobians and standard properties and illustrative examples. Taylor's and Maclaurin's series for functions of two variables, Maxima-Minima of functions of two variables. **14 hours**

Unit-III: Integral Calculus: Recapitulation of definite integrals and its properties. *Line integral:* Definition of line integral and basic properties, examples on evaluation of line integrals. *Double integral:* Definition of Double integrals and its conversion to iterated integrals. Evaluation of double integrals by changing the order of integration and change of variables. Computation of plane surface areas, volume underneath a surface of revolution using double integral. *Triple integral:* Definition of triple integrals and evaluation-change of variables, volume as triple integral. Differentiation under the integral sign by Leibnitz rule.

14 hours

Reference Books:

1. Topics in Algebra, I N Herstein, 2nd Edition, Wiley Eastern Ltd., New Delhi.
2. Higher algebra, Bernard & Child, Arihant Pub.
3. Modern Algebra, Sharma and Vasishta, Krishna Prakashan Mandir, Meerut, U.P.
4. A Course in Abstract Algebra, Vijay K Khanna and S K Bhambri, Vikas Publications.
5. Differential Calculus, Shanti Narayan, S. Chand & Company, New Delhi.
6. Integral Calculus, Shanti Narayan and P K Mittal, S. Chand and Co. Pvt. Ltd.,
7. Schaum's Outline Series, Frank Ayres and Elliott Mendelson, 5th ed. USA: McGraw Hill., 2008.
8. Mathematical Analysis, S C Malik, Wiley Eastern.
9. Text Book of B.Sc. Mathematics, G K Ranganath, S Chand & Company.

Open Elective

(For Students of other than science stream)

MATOET 2.1(B): Business Mathematics-II	
Teaching Hours : 3 Hours/Week	Credits: 3
Total Teaching Hours: 42 Hours	Max. Marks: 100 (S.A.- 60 + I.A. -40)

Course Learning Outcomes: This course will enable the students to

- Integrate concept in international business concept with functioning of global trade.
- Evaluate the legal, social and economic environment of business.
- Apply decision-support tools to business decision making.
- Will be able to apply knowledge of business concepts and functions in an integrated manner.

Unit - I: Commercial Arithmetic: Interest: Concept of Present value and Future value, Simple interest, Compound interest, Nominal and Effective rate of interest, Examples and Problems Annuity: Ordinary Annuity, Sinking Fund, Annuity due, Present Value and Future Value of Annuity, Equated Monthly Installments (EMI) by Interest of Reducing Balance and Flat Interest methods, Examples and Problems.

14

Hours

Unit - II: Measures of central Tendency and Dispersion: Frequency distribution: Raw data, attributes and variables, Classification of data, frequency distribution, cumulative frequency distribution, Histogram and give curves. Requisites of ideal measures of central tendency, Arithmetic Mean, Median and Mode for ungrouped and grouped data. Combined mean, Merits and demerits of measures of central tendency, Geometric mean: definition, merits and demerits, Harmonic mean: definition, merits and demerits, Choice of A.M., G.M. and H.M. Concept of dispersion, Measures of dispersion: Range, Variance, Standard deviation (SD) for grouped and ungrouped data, combined SD, Measures of relative dispersion: Coefficient of range, coefficient of variation. Examples and problems.

14 Hours

Unit - III: Correlation and regression: Concept and types of correlation, Scatter diagram, Interpretation with respect to magnitude and direction of relationship. Karl Pearson's coefficient of correlation for ungrouped data. Spearman's rank correlation coefficient. (with tie and without tie) Concept of regression, Lines of regression for ungrouped data, predictions using lines of regression. Regression coefficients and their properties (without proof). Examples and problems.

14 Hours

Reference Books:

1. Practical Business Mathematics, S. A. Bari New Literature Publishing Company New Delhi
2. Mathematics for Commerce, K. Selvakumar Notion Press Chennai
3. Business Mathematics with Applications, Dinesh Khattar & S. R. Arora S. Chand Publishing New Delhi
4. Business Mathematics and Statistics, N.G. Das & Dr. J.K. Das McGraw Hill New Delhi
5. Fundamentals of Business Mathematics, M. K. Bhowal, Asian Books Pvt. Ltd New Delhi
6. Mathematics for Economics and Finance: Methods and Modelling, Martin Anthony and Norman, Biggs Cambridge University Press Cambridge

7. Financial Mathematics and its Applications, Ahmad Nazri Wahidudin Ventus Publishing APS Denmark
8. Fundamentals of Mathematical Statistics, Gupta S. C. and Kapoor V. K., Sultan Chand and Sons, New Delhi.
9. Statistical Methods, Gupta S. P.: Sultan Chand and Sons, New Delhi.
10. Applied Statistics, Mukhopadhyaya Parimal New Central Book Agency Pvt. Ltd. Calcutta.
11. Fundamentals of Statistics, Goon A. M., Gupta, M. K. and Dasgupta, B. World Press Calcutta.
12. Fundamentals of Applied Statistics, Gupta S. C. and Kapoor V. K., Sultan Chand and Sons, New Delhi.

Open Elective: MATOE 2.1(C): Competitive Mathematics-II (Other than science stream students)

MATOET 2.1(C): Competitive Mathematics-II	
Teaching Hours : 3 Hours/Week	Credits: 3
Total Teaching Hours: 42 Hours	Max. Marks: 100 (S.A.- 60 + I.A. – 40)

UNIT-I: Mathematical Operations: Questions on simple mathematical operations. There are four fundamental operations, namely: addition (+), subtraction (–), multiplication (\times) and division (\div). There are also statements less than (<), greater than (>), equal to (=), not equal to (\neq) etc. Such operations are represented by symbols different from the usual ones. The candidates have to make the substitution of the real signs and solve the equations accordingly. While attempting to solve a mathematical expression, proceed according to the rule BODMAS – that is brackets of division multiplication addition and subtraction. We can perform addition and subtraction in any order.

Unit-II: Direction Sense Test: There are four directions such as north, south, east, and west. There are four regions (i) north-east (ii) north-west (iii) south-east (iv) south-west. Based on these directions problems have to perform with different mathematical techniques.

Unit-III-Time and Clock: Find the day of the week on a given data for this use the concept odd days, ordinary year and leap year. For a given time find the degree made by the hands of clock.

Unit-IV: Inserting the missing character: This includes type of questions, a figure, a set of figures, the arrangement of the matrix in given, each of which bears certain characters, be it numbers, letters or a group/combination of letters/numbers; following a certain pattern. It is required to decipher the pattern and accordingly find the missing

character in the figure.

References:

1. Quantitative aptitude for competitive exam, R.S .Aggarwal exam series 2020 book by Dr.R.S .Aggarwal and Abhijit Guha.
2. Quantitative Aptitude Quantum for CAT, II Edition, PHI Learning Pvt Ltd. Delhi, by Abhijit Guha.
3. GMAT Volume 1 and 2, Ignus Power Education Publication
4. Faster Track Objective Arithmetic (Revised Edition), Arihant Publications by Rajesh Verma

Open Elective: MATOE 2.1(D): Mathematical Modelling-II:

MATOE 2.1(D): Mathematical Modelling -II	
Teaching Hours : 3 Hours/Week	Credits: 3
Total Teaching Hours: 42 Hours	Max. Marks: 100 (S.A.- 60 + I.A. – 40)

Unit-I: Mathematical Modelling through Systems of Ordinary Differential Equations of First Order: Mathematical Modelling in Population Dynamics, Mathematical Modelling of Epidemics through Systems of Ordinary Differential Equations of First Order, Compartment Models through Systems of Ordinary Differential Equations

Unit-II: Mathematical Modelling through Systems of Ordinary Differential Equations of First Order: Mathematical Modelling in Economics through Systems of Ordinary Differential Equations of First Order.

Unit-III: Mathematical Models in Medicine, Arms Race, Battles and International Trade in Terms of Systems of Ordinary Differential Equations.

Unit-IV: Mathematical Modelling in Dynamics through Systems of Ordinary Differential Equations of First Order.

References:

1. Mathematical Modeling Models, Analysis and Applications by Sandip Banerjee, published by CRC Press, Taylor and Francis Group.
2. Mathematical Modeling Techniques - Rutherford Aris, Dover Publications.
3. Mathematical Analysis for Modeling- Judah Rosenblatt, Stoughton Bell, CRC Press, Taylor and Francis Group.