ప్రాచీన తెలుగు కవిత్వం

డిగ్రీ (జనరల్) / సెమిస్టర్

రచయితలు

డా॥ బి. అశోక్

తెలుగు విభాగం

ఎస్. వి. విశ్వ విద్యాలయం

తిరుపతి, ఆంధ్రప్రదేశ్ - 517 502

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విజయోస్తు

మమ్మీ అన్న మాటలో మమకారం కన్న
అమ్మ! అన్న మాటలో మాధుర్యం మిన్న
అమ్మ నుండి అలవడే అమృత భాష
ఆత్మీయతను పెంచే ఆంధ్ర భాష

మాధుర్యాన్ని పెంచే మాన్యభాష
రాగసుధలను రంగరించే రాష్ట్ర భాష
మమకారాన్ని పంచే మాతృభాష
తేనెలొలుకు భాష మన తెలుగు భాష

తెలుగు భాషను గౌరవిద్దాం
తెలుగు భాషలో మాట్లాడుదాం
తెలుగు జాతికి వన్నెతెద్దాం
ఇదే తెలుగుతల్లికి మనమిచ్చే నీరాజనాలు

– రచయితలు

జనరల్ తెలుగు / సెమిస్టర్ - 1

ప్రాచీన తెలుగు కవిత్వం

ఈ కోర్సు విజయవంతంగా ముగించాక, విద్యార్థులు క్రింది అభ్యసన ఫలితాలను పొందగలరు.

1. ప్రాచీన తెలుగుసాహిత్యం యొక్క ప్రాచీనతను, విశిష్టతను గుర్తిస్తారు. తెలుగు సాహిత్యంలో ఆదికవి నన్నయ కాలంనాటి భాషానంన్క ృతులను, ఇతిహాసకాలంనాటి రాజనీతి విషయాలపట్ల పరిజ్ఞానాన్ని సంపాదించగలరు.
2. శివకవుల కాలంనాటి మతపరిస్థితులను, భాషావిశేషాలను గ్రహిస్తారు. తెలుగు సుడికారం, సామెతలు, లోకోక్తులు మొదలైన భాషాంశాల పట్ల పరిజ్ఞానాన్ని పొందగలరు.
3. తిక్కన భారతంనాటి మత, ధార్మిక పరిస్థితులను, తిక్కన కవితాశిల్పాన్ని, నాటకీయతను అవగాహన చేసుకోగలరు.
4. ఎఱ్ఱన సూక్తివైచిత్రిని, ఇతిహాస కవిత్వంలోని విభిన్న రీతులపట్ల అభిరుచిని పొందగలరు. శ్రీనాథుని కాలం నాటి కవితావిశేషాలను, మొల్ల కవితా విశిష్టతను గుర్తించగలరు.
5. తెలుగు పద్యం స్వరూప-స్వభావాలను, సాహిత్యాభిరుచిని పెంపొందించుకుంటారు. ప్రాచీన కావ్యభాషలోని వ్యాకరణాంశాలను అధ్యయనం చేయడం ద్వారా భాషాసామర్థ్యాన్ని, రచనలో మెళకువలను గ్రహించగలరు.

పాఠ్య ప్రణాళిక

యూనిట్ - I

రాజనీతి – నన్నయ

మహాభారతం – సభాపర్వం – ప్రథమాశ్వాసం – (26–57 పద్యాలు)

యూనిట్ - II

దక్షయజ్ఞం – నన్నెచోడుడు

కుమారసంభవం – ద్వితీయాశ్వాసం – (49 – 86 పద్యాలు)

యూనిట్ - III

ధౌమ్య ధర్మోపదేశము – తిక్కన

మహాభారతం – విరాటపర్వం – ప్రథమాశ్వాసం – (116 – 146) పద్యాలు

యూనిట్ - IV

పలనాటి బెబ్బులి – శ్రీనాథుడు (పలనాటి వీరచరిత్ర – ద్విపద కావ్యం పుట 108 – 112 'బాలచంద్రుడు భీమంబగు సంగ్రామం బొనర్చుట.. (108)...

వెఱగంది కుంది' (112) సం. అక్కిరాజు ఉమాకాంతం ముద్రణ. వి. కె. స్వామి, బెజవాడ 1911.

యూనిట్ - V

సీతారావణ సంవాదం – మొల్ల

రామాయణము – సుందరకాండము – (40 – 87 పద్యాలు)

వ్యాకరణం

సంధులు: ఉత్వ, త్రిక, ద్రుతప్రకృతిక, నుగాగమ, ద్విరుక్తటకారాదేశ, యణాదేశ, వృద్ధి, శ్చుత్వ, జశ్త్వ, అనునాసిక సంధులు.

సమాసాలు: అవ్వయిభావ, తత్పురుష, కర్మధారయ, ద్వంద్వ, ద్విగు, బహువ్రీహి.

అలంకారాలు:

అర్థాలంకారాలు: ఉపమ, ఉత్ప్రేక్ష, రూపక, స్వభావోక్తి, అర్థాంతరవ్యాస, అతిశయోక్తి.

శబ్దాలంకారాలు: అనుప్రాస (వృత్యనుప్రాస, ఛేకానుప్రాస లాటానుప్రాస, అంత్యానుప్రాస)

ఛందస్సు

వృత్తాలు: ఉత్పలమాల, చంపకమాల, శార్దూలము, మత్తేభము;

జాతులు: కందం, ద్విపద; ఉపజాతులు: ఆటవెలది, తేటగీతి, సీసం మరియు ముత్యాలసరాలు

విషయ సూచిక

ప్రాచీన తెలుగు కవిత్వం

యూనిట్-1: రాజనీతి

యూనిట్-2: దక్షయజ్ఞం

A Course in
Communication and Soft Skills

As per Choice Based Credit System (CBCS)
For Degree I-Year/I-sem
Common to all Branches

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Year : 2026

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A Course in Communication and Soft Skills

Learning Outcomes

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

- Use grammar effectively in writing and speaking.
- Demonstrate the use of good vocabulary
- Demonstrate an understating of writing skills
- Acquire ability to use Soft Skills in professional and daily life.
- Confidently use the tools of communication skills

Unit-1: Listening Skills

i. Importance of Listening
ii. Types of Listening
iii. Barriers to Listening
iv. Effective Listening

Unit-2: Speaking Skills

a. Sounds of English: Vowels and Consonants
b. Word Accent
c. Intonation

Unit-3: Grammar

a. Concord
b. Modals
c. Tenses (Present/Past/Future)
d. Articles
e. Prepositions
f. Question Tags
g. Sentence Transformation (Voice, Reported Speech & Degrees of Comparison)
h. Error Correction

Unit-4: Writing

i. Punctuation
ii. Spelling
iii. Paragraph Writing

Unit-5: Soft Skills

a. SWOC
b. Attitude
c. Emotional Intelligence
d. Telephone Etiquette
e. Interpersonal Skills

Content

A Course in Communication and Soft Skills

Unit-1: Listening skills

Unit-2: Speaking Skills

Life Skill Course

Human Values and Professional Ethics

As per Choice Based Credit System (CBCS)
Common to all Branches

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Human Values and Professional Ethics

Learning Outcome

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

- Understand the significance of value inputs in a classroom and start applying them in their life and profession
- Distinguish between values and skills, happiness and accumulation of physical facilities, the Self and the Body, Intention and Competence of an individual, etc.
- Understand the value of harmonious relationship based on trust and respect in their life and profession
- Understand the role of a human being in ensuring harmony in society and nature.
- Distinguish between ethical and unethical practices, and start working out the strategy to actualize a harmonious environment wherever they work.

Unit-1: Introduction - Definition, Importance, Process & Classifications of Value Education

- Understanding the need, basic guidelines, content and process for Value Education
- Understanding the thought provoking issues; need for Values in our daily life
- Choices making - Choosing, Cherishing & Acting
- Classification of Value Education: understanding Personal Values, Social Values, Moral Values & Spiritual Values.

Unit-2: Harmony in the Family - Understanding Values in Human Relationships

- Understanding harmony in the Family- the basic unit of human interaction
- Understanding the set of proposals to verify the Harmony in the Family;

- Trust (*Vishwas*) and Respect (*Samman*) as the foundational values of relationship
- Present Scenario: Differentiation (Disrespect) in relationships on the basis of body, physical facilities, or beliefs.
- Understanding the Problems faced due to differentiation in Relationships
- Understanding the harmony in the society (society being an extension of family): *Samadhan*, *Samridhi*, *Abhay*, *Sah-astitva* as comprehensive Human Goals
- Visualizing a universal harmonious order in society- Undivided Society (*Akhand Samaj*), Universal Order (*Sarvabhaum Vyawastha*)- from family to world family.

Unit-3: Professional Ethics in Education

- Understanding about Professional Integrity, Respect & Equality, Privacy, Building Trusting Relationships.
- Understanding the concepts; Positive cooperation, Respecting the competence of other professions.
- Understanding about Taking initiative and Promoting the culture of openness.
- Depicting Loyalty towards Goals and objectives.

Content
Human Values and Professional Ethics

Unit-1: Introduction

Skill Development Course

Office Secretaryship

As per Choice Based Credit System (CBCS)
Common to all Branches

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Office Secretaryship

Learning Outcomes

By the successful completion of course, the student will be able to;

1. Understand the organizational hierarchy and outlines of functioning.
2. Comprehend the role of office secretaryship in a small and medium organization.
3. Acquire knowledge on office procedures and interpersonal skills.
4. Apply the skills in preparing and presenting notes, letters, statements, reports in different situations.

Unit-I: Introduction

Introduction - Organisational structure of a small and medium organization - Types of offices - Kinds of secretaries - The scope of office secretaryship.

Unit-II: Office Secretary

The role of an office secretary - Duties and responsibilities - Usage of different devices - Flowchart and office manuals - Coordinating different wings of an office/organisaton - Arranging common meetings - Operations of banking and financial services - travel and hospitality management services.

Unit-III: Office Procedures

Office procedures - Filing - Circulating files - Preparation of notes, circulars, agenda and minutes of meetings - Issue of press notes - Maintenance of files and records - Inventory, office, human resources, financial and confidential - maintaining public relations.

Content

Office Secretaryship

Unit-1: Introduction

Diversity of Microbes & Lower Plants

(Algae and Fungi)

I - B.Sc (Botany)/ I & II- Semester

As per Choice Based Credit System (CBCS)

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Microbial Diversity of Lower Plants

UNIT - I

1. Brief account of Archaebacteria, Actinomycetes.
2. Cyanobacteria: General characters, cell structure, thallus organisation and their significance as biofertilizers with special reference to *Oscillatoria, Nostoc* and *Anabaena.*
3. Lichens: Structure and reproduction; ecological and economic importance.

UNIT- II

4. Viruses: Structure, replication and transmission; plant diseases caused by viruses and their control with reference to Tobacco Mosaic and Rice Tungro.
5. Bacteria**:** Structure, nutrition, reproduction and economic importance. An outline of plant diseases of important crop plants caused by bacteria and their control with reference to Angular leaf spot of cotton and Bacterial blight of Rice.
6. General account of Mycoplasma with reference to Little leaf of brinjal and Papaya leaf curl

UNIT-III

7. General characters, structure, reproduction and classification of algae (Fritsch) and thallus organization in algae.
8. Structure and reproduction of the following: Chlorophyceae- *Volvox, Oedogonium* and*Chara.*

   Phaeophyceae-*Ectocarpus*

   Rhodophyceae- *Polysiphonia.*
9. Economic importance of algae in Agriculture and Industry.

UNIT-IV

10. General characters and classification of fungi (Ainsworth).
11. Structure and reproduction of the following:

    (a)Mastigimycotina- *Albugo*

    (b) Zygomycotina- *Mucor*

    (c) Ascomycotina- *Saccharomyces* and *Penicillium.*

    (d) Basidiomycotina- *Puccinia*

    (e) Deuteromycotina- *Cercospora.*
12. Economic importance of fungi in relation to mycorrhizae and mushrooms. General account of mushroom cultivation.

UNIT- I: MICROBIAL WORLD

1. Discovery of microorganisms, origin of life, spontaneous, biogenesis, Pasteur experiments, germ theory of disease.
2. Classification of microorganisms – R.H. Whittaker's five kingdom concept, Carl Woese's- Domain system.
3. Brief account of special groups of bacteria- Archaebacteria, Mycoplasma, Chlamydia, Actinomycetes, Rickettsias and Cyanobacteria.

UNIT- II: VIRUSES

1. Viruses- Discovery, general account, structure& replication of –T4 Phage (Lytic, Lysogenic) and TMV, Viroids, Prions.
2. Plant diseasescaused by viruses– Symptoms, transmission and control measures (Brief account only).
3. Study of Tobacco Mosaic, Bhendi Vein clearing and Papaya leaf curl diseases.

UNIT III: BACTERIA

1. Bacteria: Discovery, General characteristics, cell structure andnutrition.
2. Reproduction- Asexual and bacterial recombination (Conjugation, Transformation, Transduction).
3. Economic importance of Bacteria.

UNIT –IV ALGAE

1. General account - thallus organization and reproduction in Algae.
2. Fritsch classification of Algae (up to classes only) and economic importance.
3. Structure, reproduction and life history of *Oedogonium, Ectocarpus* and *Polysiphonia.*

UNIT V: FUNGI

1. General characteristics and outline classification (Ainsworth).
2. Structure, reproduction and life history of *Rhizopus* (Zygomycota),*Penicillium* (Ascomycota), and *Puccinia* (Basidiomycota).
3. Lichens-Structure and reproduction; ecological and economic importance.

Diversity of Microbes & Lower Plants

Chapter-1

Chapter-2

Chapter-3

Chapter-4

Chapter-9

Chapter-10

INORGANIC AND ORGANIC CHEMISTRY

I-B.Sc(Chemistry) / I - Semester

As per Choice Based Credit System (CBCS)

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Inorganic and Organic Chemistry

INORGANIC CHEMISTRY

UNIT –I

1. P-block elements–I

Group-13: Synthesis and structure of diborane and higher boranes

(B_4H_{10} and B_5H_9**),** boron-nitrogen compounds ($B_3N_3H_6$ and BN)

Group - 14: Preparation and applications of silanes and silicones.

Group - 15: Preparation and reactions of hydrazine, hydroxylamine.

UNIT-II

1. P-block elements -II

Group - 16: Classifications of oxides based on (i) Chemical behaviour and

(ii) Oxygen content.

Group-17: Inter halogen compounds and pseudo halogens.

2. Organometallic Chemistry

Definition - classification of Organometallic compounds - nomenclature, preparation, properties and applications of alkyls of Li and Mg.

ORGANIC CHEMISTRY

UNIT-III

1. Structural theory in Organic Chemistry

Types of bond fission and organic reagents (Electrophilic, Nucleophilic, and free radical reagents including neutral molecules like H_2O,NH_3& $AlCl_3$).

Bond polarization : Factors influencing the polarization of covalent bonds, electro negativity - inductive effect. Application of inductive effect (a) Basicity of amines (b) Acidity of carboxylic acids (c) Stability of carbonium ions. Resonance or Mesomeric effect, application to (a) acidity of phenol, and (b) acidity of carboxylic acids. Hyper conjugation and its application to stability of carbonium ions, Free radicals and alkenes, carbanions, carbenes and nitrenes.

Types of Organic reactions : Addition - electrophilic, nucleophilic and free radical. Substitution - electrophilic, nucleophilic and free radical. Elimination- Examples.

UNIT-IV

5. **Acyclic Hydrocarbons**

Alkenes - Preparation of alkenes. Properties: Addition of hydrogen - heat of hydrogenation and stability of alkenes. Addition of halogen and its mechanism. Addition of HX, Markonikov's rule, addition of H_2O, HOX, H_2SO_4 with mechanism and addition of HBr in the presence of peroxide (anti - Markonikov's addition). Dienes - Types of dienes, reactions of conjugated dienes - 1,2 and 1,4 addition of HBr to 1,3 - butadiene and Diel's - Alder reaction.

Alkynes - Preparation by dehydrohalogenation of dihalides, dehalogenation of tetrahalides, Properties; Acidity of acetylenic hydrogen (formation of Metal acetylides). Preparation of higher acetylenes, Metal ammonia reductions, Physical properties. Chemical reactivity - electrophilic addition of X_2, HX, H_2O (Tautomerism), Oxidation with $KMnO_4$, OsO_4, reduction and Polymerisation reaction of acetylene.

6. **Alicyclic hydrocarbons (Cycloalkanes)**

Nomenclature, Preparation by Freunds method, Wislicenus method. Properties - reactivity of cyclopropane and cyclobutane by comparing with alkanes, Stability of cycloalkanes - Baeyer's strain theory, Sachse and Mohr predictions and Pitzer's strain theory. Conformational structures of cyclobutane, cyclopentane, cyclohexane.

UNIT-V

1. Benzene and its reactivity

Concept of resonance, resonance energy. Heat of hydrogenation, heat of combustion of Benzene, mention of C-C bond lengths and orbital picture of Benzene. Concept of aromaticity - aromaticity (definition), Huckel's rule - application to Benzenoid (Benzene, Naphthalene) and Non - Benzenoid compounds (cyclopropenyl cation, cyclopentadienyl anion and tropylium cation)

Reactions - General mechanism of electrophilic substitution, mechanism of nitration, Friedel Craft's alkylation and acylation. Orientation of aromatic substitution - Definition of ortho, para and meta directing groups. Ring activating and deactivating groups with examples (Electronic interpretation of various groups like NO_2 and Phenolic). Orientation of (i) Amino, methoxy and methyl groups (ii) Carboxy, nitro, nitrile, carbonyl and sulphonic acid groups (iii) Halogens

(Explanation by taking minimum of one example from each type)

Detailed Contents
Inorganic and Organic Chemistry

BIOLOGY OF INVERTEBRATES AND CELL BIOLOGY

I - B.Sc(Zoology) / I - Semester

As per Choice Based Credit System (CBCS)

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CONTENTS

UNIT - I

UNIT - II

1.0 Protozoa to Annelida

1.1. Phylum Protozoa: General characters and outline classification up to classes. Type study: *Paramecium.*

1.2. Phylum Porifera : General characters and outline classification up to classes. Type study: *Sycon*; Canal system in Sponges.

1.3. Phylum Coelenterata: General characters and outline classification up to classes. Type study: *Obelia*; Polymorphism in Coelenterates; Corals and Coral reef formation.

1.4. Phylum Platyhelminthes: General characters and outline classification up to classes. Type study: *Fasciola hepatica*.

1.5. Phylum Nemathelminthes: General characters and outline classification up to classes. Type study: *Ascaris lumbricoides*.

1.6. Phylum Annelida: General characters and outline classification up to classes Type study: Leech; Coelom and coelomoducts in Annelids**.**

2.0 Arthropoda to Hemichordata

2.1. Phylum Arthropoda: General characters and outline classification of up to classes Type study: Prawn; Crustacean larvae; *Peripatus*- Characters and Significance

2.2. Phylum Mollusca: General characters and outline classification of up to classes Type study: *Pila*; Pearl formation in Molluscs.

2.3. Phylum Echinodermata: General characters and outline classification of up to classes. Type study: Star fish.

2.4. General characters of Hemichordata : Structure and affinities of *Balanoglossus.*

3.0 Cell Biology

3.1. Cell theory

3.2. Ultra structure of Animal cell

3.3. Structure of Plasma membrane - Fluid-mosaic model. Transport functions of Plasma membrane- Passive transport, active transport (Antiport, symport and uniport) and bulk transport.

3.4. Structure and functions of Endoplasmic reticulum Golgi body, Ribosomes, lysosomes and Mitochondrion.

3.5. Chromosomes - nomenclature types and structure. Giant chromosomes – Polytene and Lampbrush chromosomes.

3.6. Cell division - Cell-cycle stages ($G_{1,}$ S, $G_{2,}$ and M phases), Cell-cycle check points and regulation. Mitosis; Meiosis - and its significance.

4.0 Biomolecules of the Cell

4.1. Carbohydrates

4.1.1. Classification of Carbohydrates

4.1.2. Structure of Monosaccharides (Glucose and Fructose)

4.1.3. Structure of Disaccharides (Lactose and Sucrose)

4.1.4. Structure of Polysaccharides (Starch, Glycogen and Chitin)

4.2. Proteins

4.2.1. Amino acids: General properties, nomenclature, classification and structure.

4.2.2. Classification of proteins based on functions, chemical nature and nutrition, peptide bond and structure (Primary, secondary, tertiary and quaternary structures)

4.3. Lipids

4.3.1. Classification. Structure of Fatty acids (Saturated and unsaturated).

4.3.2. Triacylglycerols, Phospolipids (Lecithin and cephalin) and Steroids (Cholesterol).

4.4. Nucleic Acids

4.4.1. Structure of purines, pyrimidines, ribose and deoxyribose sugars.

4.4.2. Watson and Crick model of DNA- Nucleoside, Nucleotide, Chargaff's rule. Structure of RNA, Types of RNA - rRNA, tRNA and mRNA.

ఆధునిక తెలుగు సాహిత్యం

డిగ్రీ (జనరల్) / సెమిస్టర్ - II

రచయితలు

డా॥ ఎస్. సునీల్ కుమార్

తెలుగు విభాగం

ఎస్. వి. విశ్వ విద్యాలయం

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జనరల్ తెలుగు / సెమిస్టర్ – II

ఆధునిక తెలుగు సాహిత్యం

అభ్యసన ఫలితాలు

ఈ కోర్సు విజయవంతం ముగించాక, విద్యార్థులు క్రింది అభ్యసన ఫలితాలను పొందగలరు.

1. ఆంగ్లభాష ప్రభావం కారణంగా తెలుగులో వచ్చిన ఆధునిక సాహిత్యాన్ని, అని విశిష్టతను గుర్తిస్తారు.
2. సమకాలీన ఆధునిక సాహిత్య ప్రక్రియలైన వచన కవిత్వం, కథ, నవల, నాటకం, విమర్శ లపై అవగాహన పొందుతారు.
3. భావకవిత, అభ్యుదయ కవితలక్ష్యాలను గూర్చిన జాన్నాన్ని పొందుతారు. అస్తిత్వవాద ఉద్యమాలపుట్టుకను, అవశ్యకతను గుర్తిస్తారు.
4. కథాసాహిత్యం ద్వారా సామాజిక చైతన్యాన్ని పొందుతారు. సిద్ధాంతాల ద్వారా కాకుండా, వాస్తవ పరిస్థితులను తెలుసుకోవడం ద్వారా సిద్ధాంతాన్ని సమీక్షించగలరు.
5. ఆధునిక తెలుగు కల్పనాసాహిత్యం ద్వారా సామాజిక, సాంస్కృతిక, రాజకీయ చైతన్యాన్ని పొందుతారు.

పాఠ్య ప్రణాళిక

j ãÖ‘ { Ù I: ఆధునిక కవిత్వం

1.	ఆధునిక కవిత్వం	:	పరిచయం
2.	కొండవీడు	:	దువూరి రామిరెడ్డి (కవికోకిల గ్రంథావళి ఖండకావ్యాలు నక్షత్రమాల సంపుటి నుండి)
3.	మాతృసంగీతం	:	అనిసెట్టి సుబ్బారావు (అగ్నివీణ కవితాసంపుటి నుండి)
4.	తాతకో నూలుపోగు	:	బందరు ప్రసాదమూర్తి (కలనేత కవితాసంపుటి నుండి)

యూనిట్ - II: కథానిక

5.	తెలుగు కథానిక	:	పరిచయం
6.	భయం (కథ)	:	కాళీపట్నం రామరావు
7.	స్వేదం ఖరీదు....(కథ)	:	రెంటాల నాగేశ్వరరావు

యూనిట్ - III: నవల

8. తెలుగు నవల : పరిచయం

9. రథచక్రాలు (నవల) : మహీధర రామ్మోహన రావు (సంక్షిప్త ఇతివత్తం మాత్రం)

10. రథచక్రాలు (సమీక్షా వ్యాసం) డా.॥యల్లాప్రగడ మల్లికార్జునరావు

యూనిట్ - IV: నాటకం

11. తెలుగు నాటకం : పరిచయం

12. యక్షగానము (నాటిక) : ఎం.వి.ఎస్. హరనాథరావు

13. అపురూప కళారూపాల విధ్వంసదశ్యం యక్షగానము (సమీక్షా వ్యాసం) డా.॥ కందిమళ్ళ సాంబశివరావు

యూనిట్- V: విమర్శ

14. తెలుగు సాహిత్యం విమర్శ: పరిచయం

15. విమర్శ స్వరూప స్వభావాలు ఉత్తమ విమర్శకుడు లక్షణాలు

విషయ సూచిక

ఆధునిక తెలుగు సాహిత్యం

యూనిట్ - 1: ఆధునిక కవిత్వం

12. యక్షగానం (నాటిక)

13. అపురూప కళారూపాల విధ్వంస దృశ్యం యక్షగానం

యూనిట్ - V: విమర్శ

14. తెలుగు సాహిత్య విమర్శ – పరిచయం

15. విమర్శ – స్వరూప స్వభావాలు

A Course in

Reading & Writing Skills

As per Choice Based Credit System (CBCS)
For Degree I-year / II-sem
Common to all Branches

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A Course in Reading & Writing Skills

Learning Outcomes

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

- Use reading skills effectively
- Comprehend different texts
- Interpret different types of texts
- Analyse what is being read
- Build up a repository of active vocabulary
- Use good writing strategies
- Write well for any purpose
- Improve writing skills independently for future needs

Unit-1

Prose : 1. How to Avoid Foolish Opinions Bertrand Russell

Skills : 2. Vocabulary: Conversion of Words

: 3. One Word Substitutes

: 4. Collocations

Unit-2

Prose	: 1. The Doll's House	Katherine Mansfield
Poetry	: 2. Ode to the West Wind	P B Shelley
Non-Detailed Text	: 3. Florence Nightingale	Abrar Mohsin
Skills	: 4. Skimming and Scanning	

Unit-3

Prose : 1. The Night Train at Deoli Ruskin Bond

Poetry : 2. Upagupta Rabindranath Tagore

Skills : 3. Reading Comprehension

: 4. Note Making/Taking

Unit-4

Poetry : 1. Coromandel Fishers Sarojini Naidu

Skills : 2. Expansion of Ideas

: 3. Notices, Agendas and Minutes

Unit-5

Non-Detailed Text : 1. An Astrologer's Day R K Narayan

Skills : 2. Curriculum Vitae and Resume

: 3. Letters

: 4. E-Correspondence

Content

A Course in Reading & Writing Skills

Unit-1

Unit-2

Unit-3

Life Skill Course

Indian Culture & Science

As per Choice Based Credit System (CBCS)

Common to all Branches

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Indian Culture & Science

Learning Outcomes

By successful completion of the course, students will be able to:

1. Understand the evolution of India's culture.
2. Analyze the process of modernization of Indian society and culture from past to future.
3. Comprehend objective education and evaluate scientific development of India in various spheres.
4. Inculcate nationalist and moral fervor and scientific temper.

Unit-I: Unity in Diversity in India

Coexistence of various religions since ancient times - Hinduism, Buddhism, Jainism and Atheism, and later Sikhism, Islam and Christianity

The Bhakti (Vishnavite and Saivaite) and Sufi Movements

The concepts of seela, karuna, kshama, maitri, vinaya, santhi and ahimsa Achievements in Literature, Music, Dance, Sculpture and Painting - Craftsmanship in cloth, wood, clay, metal and ornaments

Cultural diversity, Monogamy, Family system, Important seasonal festivals

Unit-II: Social Reforms and Modern Society

Reforms by Basaveswara - Raja Rama Mohan Roy - Dayananda Saraswathi - Swamy Vivekananda - Mahatma Gandhi - B. R. Ambedkar - Reforms in Andhra by Vemana,Veerabrahmam, Gurajada, Veeresalingam and GurramJashua (only reforms in brief, biographies not needed)

Modern Society: Family unity, Community service, Social Harmony, Civic Sense, Gender Sensitivity, Equality, National Fervor

Unit-III: Science and Technology

Objectivity and Scientific Temper - Education on Scientific lines (Bloom's Taxonomy) - Online Education

Developments in Industry, Agriculture, Medicine, Space, Alternate Energy, Communications, Media through ages

Co-curricular Activities Suggested

1. Assignments, Group discussions, Quiz etc
2. Invited Lecture by a local expert
3. Visit to a scientific institutions, local heritage sites, museums, industries etc

Content
Indian Culture & Science

Unit-1: Indian Culture & Science

Skill Development Course

Advertising

As per Choice Based Credit System (CBCS)
Common to all Branches

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Advertising

Learning Outcomes

After Successful completion of this course, the students are able to;

1. Understand the field of Advertising
2. Comprehend opportunities and challenges in Advertising sector
3. Prepare a primary advertising model
4. Understand applying of related skills
5. Examine the scope for making advertising a future career

Unit-1

Introduction of advertising concepts- functions - Types of advertising - Creative advertising messages - Factors determining opportunities of a product/service/Idea

Unit-2

Role of advertising agencies and their responsibilities - scope of their work and functions - Ethical issues - Identifying target groups -Laws in advertising. Advertising Statutory Bodies in India - Role of AAAI (Advertising Agencies Association of India), ASCI (Advertising Standard Council of India)

Unit-3

Types of advertising - Basic characteristics of a typical advertisement - Reaching target groups - Local advertising - Feedback on impact of advertisement - Business promotion.

Content

Advertising

Unit-1

Unit - 2

Unit - 3

PHYSICAL AND GENERAL CHEMISTRY

I- B.Sc(Chemistry)/ II - Semester

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Physical and General Chemistry

PHYSICAL CHEMISTRY

UNIT-I

1. **Solidstate:** Symmetry in crystals. Law of constancy of interfacial angles. The law of rationality of indices. The law of symmetry. Definition of lattice point, space lattice, unit cell. Bravis lattices and crystal systems. X-ray diffraction and crystal structure. Bragg's law. Defects in crystals. Stoichiometric and non-stoichiometric defects.

UNIT-II

1. **Gaseous State:** Compression factors, deviation of real gases from ideal behavior. Vander Waal's equation of state. P-V Isotherms of real gases, Andrew's isotherms of carbon dioxide, continuity of state. Critical phenomena. The vander Waal's equation and the critical state. Law of corresponding states.Relationship between critical constants and vander Waal's constants. Joule Thomson effect.
2. **Liquid State**: Structural differences between solids, liquids and gases. Liquid crystals, the mesomorphic state. Classification of liquid crystals into Smectic and Nematic. Differences between liquid crystal and solid/liquid. Application of liquid crystals as LCD devices.

UNIT-III

3. **Solutions:** Liquid-liquid - ideal solutions, Raoult's law. Ideally dilute solutions, Henry's law. Non-ideal solutions. Vapour pressure - composition and vapour pressure- temperature curves. Azeotropes-HCl-H_2O, ethanol-water systems and fractional distillation. Partially miscible liquids-phenol-water, trimethylamine-water, nicotine-water systems. Effect of impurity on consulate temperature. Immiscible liquids and steam distillation.
Nernst distribution law. Calculation of the partition coefficient. Applications of distribution law.

GENERAL CHEMISTRY

UNIT-IV

l. **Surface Chemistry:** Definition of colloids. Solids in liquids(sols), preparation, purification, properties - kinetic, optical, electrical. Stability of colloids, Hardy-Schulze law, protective colloid.
Liquids in liquids (emulsions) preparation, properties, uses. Liquids in solids (gels) preparation, uses. Adsorption: Physical adsorption, chemisorption. Freundlisch, Langmuir adsorption isotherms. Applications of adsorption
2. **Chemical Bonding:** Valence bond theory, hybridization, VB theory as applied toClF_3, $Ni(CO)_4$, Molecular orbital theory - LCAO method, construction of M.O. diagrams for homo-nuclear and hetero-nuclear diatomic molecules (N_2, O_2, CO and NO).

UNIT-V

1. **Stereochemistry of Carbon Compounds:** Molecular representations- Wedge, Fischer, Newman and Saw-Horse formulae. Optical isomerism: Optical activity- wave nature of light, plane polarised light, optical rotation and specific rotation. Chiral molecules- definition and criteria(Symmetry elements)- Definition of enantiomers and diastereomers – Explanation of optical isomerism with examples Glyceraldehyde, Lactic acid, Alanine, Tartaric acid, 2,3-dibromopentane. D,L and R,S configuration methods and E,Z- configuration with examples.

Detailed Contents

Physical and General Chemistry

Chapter-1

Chapter-2

Chapter-3

Chapter-4

Chapter-5

BIOLOGY OF CHORDATES, EMBRYOLOGY, ECOLOGY AND ZOOGEOGRAPHY

I - B.Sc(Zoology) / II - Semester

As per Choice Based Credit System (CBCS)

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CONTENTS

UNIT I

Protochordata to Amphibia

Protochordates: Salient features of Urochordata and Cephalochordata Structure and life-history of Herdmania, Significance of retrogressive Metamorphosis-General organization of Chordates-General characters of Cyclostomes-General characters of fishes, classification up to sub-class level with examples-Type study - Scoliodon : Morphology, respiratory system, circulatory system, excretory system, nervous system and sense organs- Migration in fishes and types of scales-General characters and classification of Amphibia up to order level- Type study - Rana : Morphology, digestive system, respiratory system, circulatory system, excretory system, nervous system and reproductive system. Parental care in amphibians

UNIT II

Reptilia to Mammalia

General characters and classification of Reptilia up to order level. Type study – Calotes : Morphology, digestive system, respiratory system, circulatory system, urinogenital system and nervous system. General characters and classification of Aves up to order level with examples. Type study - Pigeon (Columbia livia) : Exoskeleton, respiratory system, circulatory system and excretory system. Significance of migration in birds. Flight adaptation in birds-General characters and classification of Mammalia up to order levelwith examples. Dentition in Mammals.

UNIT III

Embryology

Spermatogenesis, Oogenesis and Fertilization. Types of eggs, Types of cleavages, Development of frog up to gastrulation and formation of primary germ layers, Foetal membranes and their significance, Placenta : types and functions, Regeneration with reference to Turbellarians and Lizards

UNIT IV

Ecology

Biogeochemical cycles or nutrient cycles - Gaseous cycles of Nitrogen and Carbon; Sedimentary cycle- phosphorus. Definition of Community- Habitat and ecological niche Community interactions: Brief account on Competition, predation, mutualism,commensalism and parasitism.Ecological succession: Primary and secondary, seral stages, climax community with examples. Population ecology : Density and dispersions of animal populations - Growth curves and growth of animal populations- r-selected and k-selected species -Population regulation mechanisms – both biotic and abiotic-Growth of human population and its control -Future of human population

సృజనాత్మక రచన

డిగ్రీ (జనరల్) / సెమిస్టర్ - III

రచయితలు

డా॥ ఎస్. సునీల్ కుమార్

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జనరల్ తెలుగు / సెమిస్టర్ - III

సృజనాత్మక రచన

అభ్యసన ఫలితాలు

ఈ కోర్సు విజయవంతం ముగించాక, విద్యార్థులు క్రింది అభ్యసన ఫలితాలను పొందగలరు.

1. తెలుగు సాహిత్య అభ్యసన ద్వారా నేర్చుకున్న నెపుణ్యాలను, సృజనాత్మక నైపుణ్యాలుగా మార్చుకోగలరు.
2. విద్యార్థులు భాషాతత్వాన్ని, భాష యొక్క ఆవశ్యకతను, భాష యొక్క ప్రాధాన్యాన్ని గుర్తిస్తారు. మనిషి వ్యక్తిగత జీవనానికి, సామాజిక వ్యవస్థ పటిష్టతకు భాష ప్రధానమని తెలుసుకుంటారు.

   తెలుగుభాషలోని కీలకాంశాలైన 'వర్ణం–పదం–వాక్యా'ల ప్రాధాన్యాన్ని గుర్తిస్తూ, వాగ్రూప– లిఖితరూప వ్యక్తీకరణ ద్వారా భాషానైపుణ్యాలను మొరుగుపరచుకోగలరు.
3. భాషానైపుణ్యాలను అలవరుచుకోవడంతోపాటు వినియోగించడం నేర్చుకుంటారు. రచనా, భాషణానైపుణ్యాలను సృజనాత్మక రూపంలో వ్యక్తీకరించగలరు.
4. ప్రాచీన పద్యరచనతో పాటు ఆధునిక కవిత, కథ, వ్యాసం మొదలైన సాహిత్యప్రక్రియల నిర్మాణాలకు సంబంధించిన సిద్ధాంతవిషయాలను నేర్పడంతో పాటు వారిలో రచనా నైపుణ్యాలను పెంపొందించుకోగలరు.
5. సృజన రంగర, ప్రసారమాధ్యమ రంగాల్లో ఉపాధి అవకాశాలను అందిపుచ్చుకోగలరు.
6. అనువాద రంగంలో నైపుణ్యం సంపాదించగలరు.

పాఠ్య ప్రణాళిక

యూనిట్ - 1: వ్యక్తీకరణ నైపుణ్యం

1. భాషా ప్రాథమిక అంశాలు : (భాష– నిర్వచనం, లక్షణాలు, ఆవశ్యకత ప్రయోజనాలు)
2. వర్ణం, పదం, వాక్యం : (లక్షణాలు, సామాన్య– సంయుక్త– సంశ్లిష్ట వాక్యాలు)
3. భాషా నిర్మాణంలో వర్ణం, పదం, వాక్యం

యూనిట్ - II : సృజనాత్మక రచనలు

4. కవితా రచన : ఉత్తమ కవితా – లక్షణాలు
5. కథారచన : ఉత్తమ కథ – లక్షణాలు
6. వ్యాస రచన : ఉత్తమ వ్యాసం లక్షణాలు

యూనిట్ - III: అనువాద రచన

7. అనువాదం– నిర్వచనం, అనువాద పద్ధతులు

8. అనువాద సమస్యలు – భౌగోళిక, భాషా, సంస్కృతిక సమస్యలు, పరిష్కారాలు

9. అభ్యాసం - ఆంగ్లం నుండి తెలుగుకు, తెలుగు నుండి ఆంగ్లానికి ఒక పేరును అనువదించడం

యూనిట్ - IV: మాధ్యమాలకు రచన - 1 (ముద్రణామాధ్యమం/ ప్రింట్ మీడియా)

10. ముద్రణామాధ్యమం: పరిచయం – పరిధి – వికాసం

11. వివిధ రకాల పత్రికలు , పరిశీలన – పత్రికా భాష – శైలి – వైవిధ్యం

12. పత్రికా రచన : (వార్తా రచన, సంపాదకీయాలు, సమీక్షలు – అవగాహన)

యూనిట్ - V: మాధ్యమాల రచన - 2 (ప్రసార మాధ్యమం/ ఎలక్ట్రానిక్ మీడియా)

13. ప్రసార మాధ్యమాలు : (నిర్వచనం,రకాలు, విస్తృతి ప్రయోజనాలు)

14. శ్రవణ మాధ్యమాలు : (రచన, రేడియో రచన, ప్రసంగాలు, నాటికలు, ప్రసార సమాచారం)

15. దృశ్య మాధ్యమాలు : (రచన, వ్యాఖ్యానం(యాంకరింగ్), టెలివిజన్ రచన)

విషయ సూచిక
సృజనాత్మక రచన

A Course in

Conversational Skills

As per Choice Based Credit System (CBCS)
For Degree I - Year / III - Semester
Common to all Branches

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A Course in Conversational Skiils

Learning Outcomes

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

- Speak fluently in English
- Participate confidently in any social interaction
- Face any professional discourse
- Demonstrate critical thinking
- Enhance conversational skills by observing the professional interviews

Unit-I

Speech: 1. Tryst with Destiny Jawaharlal Nehru

Skills: 2. Greetings

3. Introductions

Unit-II

Speech: 1. Yes, We Can Barack Obama

Interview: 2. A Leader Should Know How to Manage Failure Dr.A.P.J.Abdul Kalam/ India Knowledge at Wharton

Skills: 3. Requests

Unit-III

Interview: 1. Nelson Mandela's Interview With Larry King

Skills: 2. Asking and Giving Information

3. Agreeing and Disagreeing

Unit-IV

Interview: 1. JRD Tata's Interview With T.N.Ninan

Skills: 2. Dialogue Building

3. Giving Instructions/Directions

Unit-V

Speech: 1. You've Got to Find What You Love Steve Jobs

Skills: 2. Debates

3. Descriptions

4. Role Play

Content

A Course in Conversational Skiils

Unit-1

Unit-2

Unit-3

Life Skill Course

Environmental Education

As per Choice Based Credit System (CBCS)
Common to all Branches

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Environmental Education

Learning outcomes

On completion of this course the students will be able to …..

1. Understand the nature, components of an ecosystem and that humans are an integral part of nature.
2. Realize the importance of environment, the goods and services of a healthy biodiversity, dependence of humans on environment.
3. Evaluate the ways and ill effects of destruction of environment, population explosion on ecosystems and global problems consequent to anthropogenic activities.
4. Discuss the laws/ acts made by government to prevent pollution, to protect biodiversity and environment as a whole.
5. Acquaint with international agreements and national movements, and realize citizen's role in protecting environment and nature.

Unit-1: Environment and Natural Resources

1. Multidisciplinary nature of environmental education; scope and importance.
2. Man as an integral product and part of the Nature.
3. A brief account of land, forest and water resources in India and their importance.
4. Biodiversity: Definition; importance of Biodiversity - ecological, consumptive, productive, social, ethical and moral, aesthetic, and option value.
5. Levels of Biodiversity: Genetic, species and ecosystem diversity.

Unit-2: Environmental Degradation and Impacts

1. Human population growth and its impacts on environment; land use change, land degradation, soil erosion and desertification.
2. Use and over-exploitation of surface and ground water, construction of dams, floods, conflicts over water (within India).
3. **Deforestation:** Causes and effects due to expansion of agriculture, firewood, mining, forest fires and building of new habitats.
4. Non-renewable energy resources, their utilization and influences.
5. A brief account of air, water, soil and noise pollutions; Biological, industrial and solid wastes in urban areas. Human health and economic risks.
6. Green house effect - global warming; ocean acidification, ozone layer depletion, acid rains and impacts on human communities and agriculture.

7. **Threats to biodiversity:** Natural calamities, habitat destruction and fragmentation, over exploitation, hunting and poaching, introduction of exotic species, pollution, predator and pest control.

Unit-3: Conservation of Environment

1. Concept of sustainability and sustainable development with judicious use of land, water and forest resources; afforestation.
2. Control measures for various types of pollution; use of renewable and alternate sources of energy.
3. **Solid waste management:** Control measures of urban and industrial waste.
4. **Conservation of biodiversity:** In-situ and ex-situ conservation of biodiversity.
5. **Environment Laws:** Environment Protection Act; Act; Wildlife Protection Act; Forest Conservation Act.
6. **International agreements:** Montreal and Kyoto protocols; Environmental movements: Bishnois of Rajasthan, Chipko, Silent valley.

Content
Environmental Education

Unit-1: Environment and Natural Resources

Life Skill Course

Personality Enhancement & Leadership

As per Choice Based Credit System (CBCS)
Common to all Branches

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Personality Enhancement & Leadership

Learning Outcomes

By successful completion of the course, students will be able to:

- Develop comprehensive understanding of personality
- Know how to assess and enhance one's own personality
- Comprehend leadership qualities and their importance
- Understand how to develop leadership qualities

Unit-I

Meaning of Personality – Explanations of Human Personality – Psychodynamic Explanations – Social Cognitive Explanation – Big Five traits of Personality

Unit-II

Assessment of Personality - Projective& Self Report Techniques - Building Self-Confidence – Enhancing Personality Skills

Unit-III

Leadership Characteristics – Types of Leaders – Importance of Leadership – Leadership Skills – Building and Leading Efficient Teams – Leadership Qualities of Abraham Lincoln, mahatma Gandhi, Prakasam Pantulu, Dr. B. R. Ambedkar & J.R.D.Tata

Content
Personality Enhancement & Leadership

Unit-1

Unit-2

Skill Development Course

Disaster Management

As per Choice Based Credit System (CBCS)
Common to all Branches

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Disaster Management

Learning Outcomes

After successful completion of the course, the students are able to;

1. Understand the nature, cause and effects of disasters
2. Comprehend the importance of Disaster Management and the need of awareness
3. Acquire knowledge on disaster preparedness, recovery remedial measures and personal precautions
4. Volunteer in pre and post disaster management service activities

Unit-I

Introduction of Disaster - Different types of disasters- Natural- (flood, cyclone, earthquake, Famine and pandemic) - Accidental- (Fire, Blasting, Chemical leakage, Rail, Aviation, Road boat tragedies and nuclear pollution) - Disaster Management Act 2005

Unit-II

Causes and immediate effects of Disasters - Preparedness of disasters –Precautions – Dissemination of information - Nature and concepts - Role of National Disaster Management Authority and Role of Government and non governmental organizations in protecting human livestock and natural resources.-Use of technology -Role of Citizens and Youth in the prevention.

Unit-III

Post disaster effects - short term - Procedures for Rehabilitation and Recovery - Role of volunteers and Safety Precautions - Long term remedial and preventive measures – Collection, filing and storage of information - Case studies.

Content
Disaster Management

Unit-1

Unit-3

Plant Physiology and Metabolism

II- B.Sc(Botany)/ III- Semester

As per Choice Based Credit System (CBCS)

SELF SLM LEARNING MATERIAL

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Plant Physiology and Metabolism

UNIT – I: Plant – Water Relations

1. Physical properties of water, Importance of water to plant life.
2. Diffusion, imbibition and osmosis; concept & components of Water potential.
3. Absorption and transport of water and ascent of sap.
4. Transpiration –Definition, types of transpiration, structure and opening and closing mechanism of stomata.

UNIT –II: Mineral Nutrition & Enzymes

1. Mineral Nutrition**:** Essential elements (macro and micronutrients) and their role in plant metabolism, deficiency symptoms.
2. Mineral ion uptake (active and passive transport).
3. Nitrogen metabolism- biological nitrogen fixation in *Rhizobium*, outlines of protein synthesis (transcription and translation).
4. Enzymes**:** General characteristics, mechanism of enzyme action and factors regulating enzyme action.

UNIT –III: Photosynthesis

1. Photosynthesis: Photosynthetic pigments, photosynthetic light reactions, photophosphorylation, carbon assimilation pathways: C3, C4, and CAM (brief account)
2. Photorespiration and its significance.
3. Translocation of organic solutes: mechanism of phloem transport, source-sink relationships.

UNIT – IV: Plant Metabolism

1. Respiration: Glycolysis, anaerobic respiration, TCA cycle, electron transport system. Mechanism of oxidative phosphorylation.
2. Lipid Metabolism**:** Types of lipids, Beta-oxidation.

UNIT –V: Growth and Development

1. Growth and development: definition, phases and kinetics of growth.
2. Physiological effects of phytohormones - Auxins, Gibberellins, Cytokinins, ABA, Ethylene and Brassinosteroids.
3. Physiology of flowering -photoperiodism, role of phytochrome in flowering; Vernalization.
4. Physiology of Scenescence and Ageing.

Detailed Contents

Plant Physiology and Metabolism

Unit-I

Unit-II

Unit-III

Unit-IV

Unit-V

IN-ORGANIC, PHYSICAL, ORGANIC CHEMISTRY

II- B.Sc(Chemistry)/ III - Semester

As per Choice Based Credit System (CBCS)

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CONTENTS

Unit - I

Unit - II

Unit – I (Inorganic Chemistry-III)

1. Coordination Chemistry

IUPAC nomenclature, bonding theories – review of Werner's theory and Sidgwick's concept of coordination, Valence bond theory, geometries of coordination numbers 4-tetrahedral and square planar and 6-octahedral and its limitations, crystal filed theory, splitting of d-orbitals in octahedral, tetrahedral and square-planar complexes – low spin and high spin complexes – factors affecting crystal-field splitting energy, merits and demerits of crystal-field theory. Isomerism in coordination compounds – structural isomerism and stereo isomerism, stereochemistry of complexes with 4 and 6 coordination numbers.

2. Spectral and Magnetic properties of Metal Complexes

Electronic absorption spectrum of $[Ti(H_2O)_6]^{3+}$ ion. Types of magnetic behavior, spin-only formula, calculation of magnetic moments, experimental determination of magnetic susceptibility Gouy method.

3. Reactivity of Metal Complexes

Labile and inert complexes, ligand substitution reactions S_N1 and S_N2, substitution reactions of square planar complexes Trans effect and applications of trans effect.

4. Stability of Metal Complexes

Thermodynamic stability and kinetic stability, factors affecting the stability of metal complexes, chelate effect, determination of composition of complex by Job's method and mole ratio method.

5.Hard and soft acids bases (HSAB)

Classification, Pearson's concept of hardness and softness, application of HSAB principles Stability of compounds / complexes, predicting the feasibility of a reaction.

6. Bioinorganic Chemistry

Essential elements, biological significance of Na, K, Mg, Ca, Fe, Co, Ni, Cu, Zn and chloride (Cl^-). Metalloporphyrins hemoglobin, structure and function, Chlorophyll, structure and role in photosynthesis.

UNIT – II (Organic Chemistry – III)

1. Nitrogen Compounds

Nitro hydrocarbons: Nomenclature and classification nitro hydrocarbons structure. Tautomerism of nitroalkanes leading to aci and keto form. Preparation of Nitroalkanes. Reactivity halogenation, reaction with HONO (Nitrous acid), Nef reaction and Mannich reaction leading to Michael addition and reduction.

Amines (Aliphatic and Aromatic): Nomenclature, Classification into 1^0, 2^0, 3^0 Amines and Quarternary ammonium compounds. Preparative methods -1. Ammonolysis of alkyl halides 2. Gabriel synthesis 3. Hoffman's bromamide reaction (mechanism).

Reduction of Amides and Schmidt reaction. Physical properties and basic character – Comparative basic strength of Ammonia, methyl amine, dimethyl amine, trimethyl amine and aniline – comparative basic strength of aniline, N-methylaniline and N,N-

dimethyl aniline (in aqueous and non-aqueous medium), steric effects and substituent effects. Use of amine salts as phase transfer catalysts. Chemical properties: a) Alkylation b) Acylation c) Carbylamine reaction d) Hinsberg separation e) Reaction with Nitrous acid of 1^0, 2^0, 3^0 (Aliphatic and aromatic amines). Electrophilic substitutions of Aromatic amines – Bromination and Nitration. oxidation of aryl and 3^0 Amines. Diazotization

Cyanides and isocyanides: Nomenclature (aliphatic and aromatic) structure. Preparation of cyanides from a) Alkyl halides b) from amides c) from aldoximes. Preparation of isocyanides from Alkyl halides and Amines. Properties of cyanides and isocyanides, a) hydrolysis b) addition of Grignard reagent iii) reduction iv) oxidation.

2. Heterocyclic Compounds

Introduction and definition: Simple 5 membered ring compounds with one hetero atom Ex. Furan. Thiophene and pyrrole. Importance of ring system presence in important natural products like hemoglobin and chlorophyll. Numbering the ring systems as per Greek letter and Numbers. Aromatic character 6- electron system (four-electrons from two double bonds and a pair of non-bonded electrons from the hetero atom). Tendency to undergo substitution reactions.

Resonance structures: Indicating electron surplus carbons and electron deficient hetero atom. Explanation of feebly acidic character of pyrrole, electrophillic substitution at 2 or 5 position, Halogenation, Nitration and Sulphonation under mild conditions. Reactivity of furan as 1,3-diene, Diels Alder reactions (one example). Sulphonation of thiophene purification of Benzene obtained from coal tar). Preparation of furan, Pyrrole and thiophene from 1,4,- dicarbonyl compounds only, Paul-Knorr synthesis, structure of pyridine, Basicity Aromaticity Comparison with pyrrole one method of preparation and properties Reactivity towards Nucleophilic substitution reaction chichibabin reaction.

3. Carbohydrates

Monosaccharides: All discussion to be confined to (+) glucose as an example of aldo hexoses and (-) fructose as example of ketohexoses. Chemical properties and structureal elucidation: Evidences for straight chain pentahydroxy aldehyde structure (Acetylation, reduction to n-hexane, cyanohydrin formation, reduction of Tollen's and Fehling's reagents and oxidation to gluconic and saccharic acid). Number of optically active isomers possible for the structure, configuration of glucose based on D-glyceraldehyde as primary standard (no proof for configuration is required). Evidence for cyclic structure of glucose (some negative aldehydes tests and mutarotation). Cyclic structure of glucose. Decomposition of cyclic structure (Pyranose structure, anomeric Carbon and anomers). Proof for the ring size (methylation, hydrolysis and oxidation reactions). Different ways of writing pyranose structure (Haworth formula and chair conformationa formula). Structure of fructose: Evidence of 2 – ketohexose structure (formation of penta acetate, formation of cyanohydrin its hydrolysis and reduction by HI to give 2-Carboxy-n-hexane). Same osazone formation from glucose and fructose, Hydrogen bonding in osazones, cyclic structure for fructose (Furanose structure and Haworth formula).

Interconversion of Monosaccharides: Aldopentose to aldo hexose eg: Arabinose to D-Glucose, D-Mannose (Kiliani Fischer method). Epimers, Epimerisation Lobry de bruyn van Ekenstein rearrangement. Aldohexose to Aldopentose eg: D-glucose to D-arabinose by Ruff'f degradation. Aldohexose (+) (glucose) to ketohexose (-) (Fructose) and Ketohexose (fructose) to aldohexose (Glucose)

4. Amino Acids and Proteins

Introduction: Definition of Amino acids, classification of Amino acids into alpha, beta,

and gama amino acids. Natural and essential amino acids – definition and examples, classification of alpha amino acids into acidic, basic and neutral amino acids with examples. Methods of synthesis: General methods of synthesis of alpha amino acids (specific examples Glycine, Alanine, valine and leucene) by following methods: a) from halogenated carboxylic acid b) Malonic ester synthesis c) strecker's synthesis.

Physical properties: Optical activity of naturally occurring amino acids: L-configuration, irrespective of sign rotation, Zwitterion structure – salt like character - solubility, melting points, amphoteric character , definition of isoelectric point.

Chemical properties: General reactions due to amino and carboxyl groups – lactams from gamma and delta amino acids by heating peptide bond (amide linkage). Structure and nomenclature of peptides and proteins.

5. Mass Spectrometry

Basic principles Molecular ion / parent ion, fragment ions / daughter ions. Theory formation of parent ions. Representation of mass spectrum. Identification of parent ion, (M+1), (M+2), base peaks (relative abundance 100%) Determination of molecular formula – Mass spectra of ethylbenzene, acetophenone, n-butyl amine and 1- proponal.

Unit-III (physical chemistry-III)

1. Chemical Kinetics

Rate of reaction, factors influencing the rate of a reaction-concentration, temperature, pressure, solvent, light, catalyst. Experimental methods to determine the rate of reaction. Definition of order and molecularity. Derivation of rate constants for first, second, third and zero order reactions and examples. Derivation for time half change. Methods to determine the order of reactions. Kinetics of complex reactions (first order only): opposing reactions, parallel reactions, consecutive reactions and chain reactions. Effect of temperature on rate of reaction, Arrhenius equation, concept of activation energy. Theories of reaction rates- collision theory-derivation of rate constant for bimolecular reaction. The transition state theory (elementary treatment).

2. Photochemistry

Difference between thermal and photochemical processes. Laws of photochemistry-Grothus-Draper's law and Stark-Einstein's law of photochemical equivalence. Quantum yield. Ferrioxalate actinometry. Photochemical hydrogen- chlorine, hydrogen-bromine reaction. Jablonski diagram depicting various processes occurring in the excited state, qualitative description of fluorescence, phosphorescence, non-radiative processes (internal conversion, intersystem crossing). Photosensitized reactions- energy transfer processes (simple example)

3. Thermodynamics

The first law of thermodynamics-statement, definition of internal energy and enthalpy. Heat capacities and their relationship. Joule's law-Joule-Thomson coefficient. Calculation of w, q, dU and dH for the expansion of perfect gas under isothermal and adiabatic conditions for reversible processes. State function.

Temperature dependence of enthalpy of formation-Kirchoff's equation. Second law of thermodynamics. Different Statements of the law. Carnot cycle and its efficiency. Carnot theorem. Thermodynamic scale of temperature. Concept of entropy, entropy as a state function, entropy changes in cyclic, reversible, and irreversible processes and reversible phase change. Calculation of entropy changes with changes in V & T and P&T. Entropy of mixing inert perfect gases. Entropy changes in spontaneous and equilibrium processes.

The Gibbs (G) and Hlmholtz (A) energies. A & G as criteria for thermodynamic equilibrium and spontaneity-advantage over entropy change. Gibbs equations and the Maxwell relations. Variation of G with P, V and T.

ANIMAL PHYSIOLOGY, GENETICS & EVOLUTION

II - B.Sc(Zoology) / III - Semester

As per Choice Based Credit System (CBCS)

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UNIT-II

UNIT-III

ANIMAL PHYSIOLOGY, GENETICS & EVOLUTION

UNIT I

1.0. Physiology of Digestion

1.1 Definition of digestion and types of digestion – extra and intracellular.

1.2 Digestion of Carbohydrates, proteins, lipids and cellulose digestion.

1.3 Absorption and assimilation of digested food materials.

1.4 Gastrointestinal hormones- control of digestion.

2.0 Physiology of Respiration

2.1. Types of respiration – external and internal respiration.

2.2. Structure of mammalian lungs and gaseous exchange.

2.3. Transport of oxygen – formation of oxyhaemoglobin and affinity of haemoglobin for Oxygen, Oxygen dissociation curves.

2.4. Transport of CO_2 – Chloride shift, Bohr effect.

2.5. Cellular respiration – Main steps of glycolysis, Kreb's cycle, electron transport, Oxidative phosporylation and ATP production (Chemosmotic theory).

3.0. Physiology of Circulation

3.1. Open and closed circulation.

3.2. Structure of mammalian heart and its working mechanism- Heartbeat and cardiac cycle. Myogenic and neurogenic hearts.

3.3. Regulation of heart rate – Tachycardia and Bradycardia.

4.0. Physiology of Excretion

4.1. Definition of excretion.

4.2. Forms of nitrogenous waste material and their formation; classification of animals on the basis of excretory products.

4.3. Gross organization of mammalian excretory system and structure of kidney.

4.4. Structure and function of Nephron – Counter current mechanism.

UNIT II

1.0. Physiology of muscle contraction

1.1 General structure and types of muscles.

1.2. Ultra structure of skeletal muscle.

1.3. Sliding filament mechanism of muscle contraction.

1.4. Chemical changes during muscle contraction – role of calcium, ATP utilization and its replenishment.

2.0. Physiology of nerve impulse

2.1. Structure of nerve cell.

2.2. Nature of nerve impulse – resting potential and action potential. Properties of nerve impulse – threshold value, refractory period, all or none response.

2.3. Conduction of nerve impulse along an axon – local circuit theory and saltatory conduction theory.

2.4. Structure of synapse, mechanism of synaptic transmission – electrical and chemical transmissions.

3.0 Physiology of Endocrine System

3.1. Relationship between hypothalamus and pituitary gland.

3.2. Hormones of hypothalamus.

3.3. Hormones of Adenohypophysis and Neurohypophysis.

3.4. Hormones of pineal gland, thyroid gland, parathyroid, thymus, adrenal and pancreas.

3.5. Endocrine control of mammalian reproduction – Male and female hormones – Hormonal control of menstrual cycle in humans.

4.0. Physiology of Homeostasis

4.1. Concept of Homeostasis and its basic working mechanism.

4.2. Mechanism of Homeostasis – giving three illustrations viz., Hormonal control of glucose levels, Water and ionic regulation by freshwater and marine animals and temperature regulation in man.

UNIT III

1.0 Genetics

1.1 Mendel's laws – Law of segregation and independent assortment; Genetic interactions Incomplete dominance, codominance and epistasis.

1.2. Identification of DNA as the genetic material –Griffith's experiment and Hershey – Chase experiment.

1.3. Central dogma of molecular biology – Brief account of DNA replication (Semi-conservative method), Replication fork (Continous and discontinous synthesis); Transcription– Brief account of initiation, elongation and termination in eukaryotes; Translation; Genetic code; gene regulation as exemplified by lac operon.

1.4. Human karyotyping, barr bodies and Lyon hypothesis and Amniocentesis chromosomal disorders – Autosomal and sex chromosomes.

2.0. Organic Evolution

2.1. Genetic basis of Evolution, Gene pool and gene frequencies, Hardy-Weinberg's, Law, Force of destabilization, natural selection, genetic drift, Mutation, Isolation and Migration.

2.2. Speciation – Allopatry and sympatry.

PHYSIOLOGY BIOTECHNOLOGY, SEED TECHNOLOGY AND HORTICULTURE

II - B.Sc (Botany)/ IV - Semester

As per Choice Based Credit System (CBCS)

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Physiology, Biotechnology, Seed Technology and Horticulture

Unit - I: Physiology (Part-A)

1. Water Relations: Importance of water to plant life, physical properties of water, diffusion, imbibition, osmosis; water, osmotic and pressure potentials; absorption, transport of water, ascent of sap; transpiration; Stomatal structure and movements.
2. Mineral Nutrition: Essential macro and micro mineral nutrients and their role; symptoms of mineral deficiency; absorption of mineral ions; passive and active processes.
3. Enzymes: Nomenclature, characteristics, mechanism and regulation of enzyme action, enzyme kinetics, factors regulating enzyme action.
4. Photosynthesis: Photosynthetic pigments, absorption and action spectra; Red drop and Emerson enhancement effect; concept of two photosystems; mechanism of photosynthetic electron transport and evolution of oxygen; photophosphorylation; Carbon assimilation pathways: C_3, C_4 and CAM; photorespiration.
5. Translocation of organic substances: Mechanism of phloem transport; source-sink relationships.

Unit - II: Physiology (Part-B)

6. Respiration: Aerobic and Anaerobic; Glycolysis, Krebs cycle; electron transport system, mechanism of oxidative phosphorylation, pentose phosphate pathway.
7. Nitrogen Metabolism: Biological nitrogen fixation, nitrate reduction, ammonia assimilation, amino acid synthesis and protein synthesis.
8. Lipid metabolism: Structure and functions of lipids; convertion of lipids to carbohydrates, β - oxidation
9. Growth and Development: Definition, phases and kinetics of growth. Physiological effects of phytohormon- auxins, gibberellins, cytokinins, ABA, ethylene and brassinosteroids; Physiology of flowering and photoperiodism, role of phytochrome in flowering.
10. Stress Physiology: Concept and plant responses to water, salt and temperature stresses.

Unit - III: Biotechnology

11. Tissue culture: Introduction, sterilization procedures, culture media - composition and preparation; explants.
12. Callus culture; cell and protoplast culture, Somatic hybrids and cybrids.
13. Applications of tissue culture: Production of pathogen free plants and somaclonal variants, production of stress resistance plants, secondary metabolites and synthetic seeds.
14. Biotechnology: Introduction, history and scope.
15. rDNA technology: Vectors and gene cloning and transgenic plants.

Unit - IV: Seed Technology and Horticulture

16. Seed: Structure and types. Seed dormancy; causes and methods of breaking dormancy.
17. Seed storage: Seed banks, factors affecting seed viability, genetic erosion. Seed production technology; seed testing and certification.
18. Horticulture techniques: Introduction, Cultivation of ornamental and vegetable crops, Bonsai and landscaping
19. Floriculture: Introduction. Importance of green house, polyhouse, mist chamber, shade nets; Micro irrigation systems. Floriculture potential and its trade in India
20. Vegetative Propagation of plants: Stem, root and leaf cuttings. Layering and bud grafting. Role of plant growth regulators in horticulture.

CHEMISTRY & INDUSTRY

II-B.Sc (Chemistry) / IV- Semester

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UNIT-I: SEPARATION TECHNIQUES

Introduction, Solvent Extraction, Principles and Process, Batch Extraction, Continuous Extraction and Counter Current Extraction, Application and Determination of Iron (III).

Unit-II: SPECTROPHOTOMETRY

Introduction-Chromatography, Classification of Chromatography Methods-Principles of Differential Migration Adsorption Phenomenon, Adsorption Phenomenon, Nature of Adsorbents, Solvent Systems RF Values, Factors Effecting RF Values-Paper Chromatography, Principles of RF Values, Experimental Procedures, Choice of Paper and Solvent Systems, Developments of Chromatography Ascending, Descending and Radial, Two Dimensional Chromatography, Applications-Thin Layer Chromatography (TLC), Advantages, Principles, Factors Effecting Values, Experimental Procedures, Adsorbents and Solvents, Preparation of Plates, Development of the Chromatogram, Detection of the Spots, Applications-Column Chromatography, Principle, Experimental Procedures, Stationary and Mobile Phases, Separation Technique, Applications-High Performance Liquid Chromatography (HPLC) , Principles and Applications-Gas Liquid Chromatography (GLC), Principles and Applications.

Unit-III: MOLECULAR SPECTROSCOPY

General Features of Absorption Spectroscopy-Introduction-Beer Lambort's Law and its Limitations-Introduction- Transmittance-Absorbance and Molar Absorptivity-Single and Double Beam spectrophotometers-Application of Beer-Lambert Law for Quantitative Analysis.

Unit-IV: ELECTRONIC SPECTROSCOPY

Electronic Spectroscopy, Introduction to Molecular Spectroscopy, Interaction of Electromagnetic Radiation with Molecules and Types of Molecular Spectra-Potential Energy Curves for Bonding and Antibonding Molecular Orbitals, Introduction-Energy Levels of Molecules-Selection Rules for Electronic Spectra-Types of Electronic Transitions in Molecules Effect of Conjugation-Concept of Chromophore.

Unit-V: INFRA RED SPECTROSCOPY

Energy Levels of Simple Harmonic Oscillator, Introduction-Molecular Vibration Spectrum, Selection Rules-Determination of Force Constant-Qualitative Relation of Force Constant to Bond Energies-An harmonic Motion of Real Molecules and Energy Levels-Modes of Vibrations in Polyatomic Molecules-Characteristic Absorption Bands of Various Functional Groups-Finger Print Nature of Infrared Spectrum.

Unit-VI: RAMAN SPECTROSCOPY

Concept of Polarizability, Introduction, Selection Rules-Pure Rotational and Pure Vibrational Raman Spectra of Diatomic Molecules, Selection Rules.

Unit-VII: PROTON MAGNETIC RESONANCE SPECTROSCOPY

Principles of Nuclear Magnetic Resonance- Equivalent and Non-Equivalent Protons-Position of Signals and Chemical Shift-NMR Splitting of Signals, Spin-Spin Coupling, Coupling Constants-Applications of NMR.

Unit-VIII: SPECTRAL INTERPRETATION

Spectral Interpretation of Some Compounds, Phenylacetylene, Acetophenone, Cinnamic acid, Paranitroaniline.

Unit-IX: DRUGS

Introduction of Drug and Disease, Historical Evolution, Sources-plant, Animal Synthetic, Biotechnology and Human Genetherapy –Pharmacy, Pharmacology, Pharmacophore, Pharmacodynamics, Pharmacokinetics, Metabolites and Antimetabolities-Nomenclature, Classification Based on Structures and Therapeutic-Synthesis and TherapeuticActivity –Pencillin, Separation and Isolation-Drug Development of different pencillins-Drug Development of HIV-AIDS, Prevention of AIDS, Drugs Available, NNRTIS, NNRTIS, Monographs of Drugs.

Unit-X: FORMULATIONS

Need of Conversion of Drugs into Medicine, Additives used in Preparing the Dosage Form-Different Types of Formulation.

Unit-XI: PESTICIDES

Need of Conversion of Drugs into Medicine, Types of Pesticides-Rodenticides Plant Growth Regulators-Pheremones and Hormones-Synthesis of Pestcides.

Unit-XII: GREEN CHEMISTRY

Introduction, Definition of Green Chemistry , Need of Green Chemistry, Basic Principles of Green Chemistry-Green Synthesis, Evalution of the Type of the Reaction-Pericyclic Reactions (No By-Product)-Selection of Solvents, Green Catalysis, Microwave and Ultrasound Assisted Green Synthesis, Aldol Condensation, Connizaro Reaction, Diels-Alder Reaction, Strecker Synthesis, Willaimson Synthesis Williamson Synthesis, Dieckmann Condensation.

Unit-XIII: MACROMOLECULES

Classification of Polymers-Chemistry of Polymerization-Chain Polymerization-Step Polymerisation- Coordination Polymerization-Tacticity-Molecular Weight of Polymers, Number Average and Weight Average Molecular Weight-Degree of Polymerization-Determination of Molecular Weight of Polymers by Viscometry -Osmometry and Light Scattering Methods-Kinetic of Free Radical Polymerization, Derivation of Rate Law-Preparation and Indudtrial Application, Polyethylene, PVC and Teflon, Poly acrylonitrile, Terelene and Nylon 66-Introduction to Biodegradability

Unit-XIV: MATERIALS SCIENCE

Superconductivity, Characteristics of Superconductors, Meissner Effect, Types of Superconductors and Applications-Nanomaterials, Synthetic Techniques-Types of methods of Nanotechnology, Bottom-up-sol-gel Method, Top-down-Electrodeposition Method-Nanomaterials, Properties and Applications of Nanomaterials-Composites-Definition, General Characteristics-Particle Reinforce and Fiber Reinforce Composites and their Applications.

Unit-XV: CATALYSIS

Homogeneous and Hetrogeneous Catalysis-Kinetics of Specific Acid Catalyzed Reactions, Inversion of Cane Sugar-Kinetic of Specific Base Catalyzed Reactions, Base Catalyzed Conversion of Acetone to Discetone Alcohal-Acid and Base Catalyzed Reactions, Hydrolysis of Esters, Multarotation of Gulcose-Cataytic Activity at Surfaces-Mechanism of Hetrogenous Catalysis-Langmuir-Hinshelwood Mechanism-Enzyme catalysis: Classification and Characteristics of Eznzyme catalysis ,Significance of Michaelis Constant-Factors Affecting Enzyme Catalysis, Effect of Temperature, PH Concentration and Inhibitor-Catalytic Efficiency-Mechanism of Oxidation of Ethanol by Alcohol Dehydrogenase.

APPLIED ZOOLOGY

II - B.Sc(Zoology) / IV - Semester

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Unit-III

Applied Zoology

UNIT I

1.0 Fisheries and Aquaculture

1.1 Capture fisheries – Introduction

1.2 Types of fisheries, Fishery resources from Freshwater, Brackish water and Marine habitats.

1.3 Finfish and shell fisheries.

1.4 Fishing gears and fishing crafts.

1.5 Freshwater, Brackish water and Mariculture.

1.6 Site selection criteria.

1.7 Aquaculture systems.

1.8 Induced breeding.

1.9 Hatchery design and Management

1.10 Larval rearing – Nursery ponds, rearing and grow out ponds

1.11 Shrimp and prawn culture

1.12 Hatchery systems, Seed transport, common diseases and control

1.13 Post-harvest technology

1.14 Preservation and processing – Freezing, solar drying, Canning, salting, smoking.

UNIT II

2.0 Clinical Science

2.1 Hematology

- 2.1.1 Blood composition and functions
- 2.1.2 Blood groups and transfusion problems
- 2.1.3 Blood diseases – Anemia, Leukemia, Leucocytosis, Leucopaenia
- 2.1.4 Biopsy and autopsy – clinical importance

2.2 Immunology

- 2.2.1 Types of immunity – Innate and acquired
- 2.2.2 Antigens – Haptenes and epitopes and their properties
- 2.2.3 Structure and biological properties of human immunoglobulin G (IgG)
- 2.2.4 Hypersensitivity – immediate and delayed

2.3 Important Human Parasites

2.3.1 Blood Parasites (Structure and Clinical significance of *Plasmodium*).

2.3.2 Intestinal parasites – Structure and clinical significance *Entamoeba, Giardia, Taenia solium, Ancylostoma, Enterobius*

UNIT III

3.0 Animal Biotechnology

3.1 Animal Biotechnology: Scope of Biotechnology, Cloning vectors - Characteristics of vectors, Plasmids.

3.2 Gene Cloning – Enzymatic cleavage of DNA, Restriction enzymes (Endonucleases) and Ligation.

3.3 Transgenesis and Production of transgenic animals (Fish and Goat).

3.4 Application of Stem Cell technology in cell based therapy (Diabetes and Parkinson's diseases)