FIRST SEMESTER

CORE COURSE-1A BOTANY

Title: DIVERSITY OF MICROBES AND CRYPTOGAMS(THALLOPHYTA)

Course Code– AUBSEI.1B

Credits 05 (4L+0T+1P) **Max. Marks: 150 (Theory: 100 Practical: 50)**
Contact hours per week: 06 **Internal: 60 (Theory: 40 Practical: 20)**
Exam duration: 03:00 Hrs (Each T & P) **End Term Exam: 90 (Theory: 60 Practical: 30)**

Course Objectives:

- To make students understand about the various features of plant kingdom and algae.
- To make students aware about the various characteristics of Bacteria and Fungi.
- To impart knowledge about the different Plant diseases.

Outcomes:

- Students will learn about the general characters of Cryptogams.
- Students will learn the basic concept of Botany.
- Students will gain knowledge about the plant diseases.

Course Content:

Unit I:

Viruses and Bacteria: General account of viruses and mycoplasma, Bacteria-structure, nutrition. Reproduction and economic importance, General account of Cyanobacteria, Nostoc, Oscillatoria and economic importance,.

Unit II

Algae: General Characters, classification and economic importance, important features and life history of chlorophyceae: Spirogyra,Ulothrix, Xanthophyceae-Vaucheria, Phaeophyceae Ectocarpus, Sargassum, Rhodophyceae-Polysiphonia.

Unit III

Fungi: General characters, classification and economic importance; important features and life history of Mastigomycotina-Phytophthora Oomycotina-Albugo, Ascomycotina-, Penicillium,yeast, Basidiomycotina-Puccinia, Ustilago and Agaricus, Deuteromycotina-, Colletotrichum, Alternariaand General account of Lichens.

Unit IV

Plant diseases special studies about green ear disease, white rust, Stem rust, disease of Wheat, Smut disease, Citruscanker, Tobacco mosaic disease.

RecommendedTexts:

1. Pandey S. N. & others.1995, A Text Book of Botany Vol. I, Vikas Publications Delhi.
2. Gupta P. K. 1999.Genetics Rastogi Publications, Meerut.
3. Vashistha, B.R. 1989, Algae, S. Chand and Co. Delhi.
4. Vashistha, B.R. 1989, Fungi, S. Chand and Co. Delhi.

PRACTICAL SYLLABUS

Title: DIVERSITY OF MICROBES AND CRYPTOGAMS(THALLOPHYTA) LAB
Course Code– AUBSEI.1BP

LIST OF EXPERIMENTS:

1. Microscopic preparations and study of the following algalmaterial: Nostoc, Oscillatoria, Chlamydomonas, Volvox, spirogyra, Oedogonium,Vaucheria, Chara, Ectocarpus Sargassum and Polysiphonia.
2. Staining of different types of Bacteria.
3. Study of some locally available plant diseases caused by Viruses. Mycoplasma, Bacteria and Fungi in field/laboratory.
4. TMV, Black stem rust of wheat, loose smut of wheat. Citrus canker.
5. Brown leaf spot of rice, Red rot of sugarcane, Early blight of potato, Wilt disease of potato, Tomato.

Evaluation Scheme of Practical Examination:

Internal Evaluation (20 marks)
Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 4-point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

PRACTICAL PER FORMANCE &VIVA DURING THE SEMESTER (20MARKS)				**TOTAL**
EXPERIMENT (05 MARKS)	FILE WORK (05MARKS)	ATTENDANCE (05MARKS)	VIVA (05MARKS)	INTERNAL (20 MARKS)

External Evaluation (30 Marks)

The external evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

Experiment	**File work**	**Viva**	**Total**
(10 MARKS)	(10 MARKS)	(10 MARKS)	(30 MARKS)

CORE COURSE-2A CHEMISTRY

Title: ORGANIC CHEMISTRY
Course Code– AUBSEI.2

Credits 05 (4L+0T+1P) | **Max. Marks: 150 (Theory: 100 Practical: 50)**
Contact hours per week: 06 | **Internal: 60 (Theory: 40 Practical: 20)**
Exam duration: 03:00 Hrs (Each T & P) | **End Term Exam: 90 (Theory: 60 Practical: 30)**

Course Objectives:

- To review the concept of isomerism and its types.
- To develop an understanding of chemistry of hydrocarbons and their halogenated derivatives.

Unit I Basics of Organic Chemistry

Organic Compounds: Classification, and Nomenclature, Hybridization, Shapes of molecules, Influence of hybridization on bond properties. Electronic Displacements: Inductive, electromeric, resonance and mesomeric effects, hyperconjugation and their applications; Dipole moment. Homolytic and Heterolytic fission with suitable examples. Electrophiles and Nucleophiles; Nucleophlicity and basicity; Types, shape and their relative stability of Carbonations, Carbanions, Free-radicals and Carbenes. Introduction to types of organic reactions and their mechanism: Addition, Elimination and Substitution reactions

Unit- II Stereochemistry of organic compounds:

Concepts of isomerism. Types of isomerism.Optical isomerism- elements of symmetry, molecular chirality, enantiomers, properties of enantiomers, chiral and achiral molecules with two stereogenic centres, diastereomers, threo and erythro diastereomers, meso compounds, resolution of enantiomers.Relative and absoluteconfiguration, sequence rules, D&L andR & S systemsof nomenclature. Geometric isomerism; determination of configuration of geometricisomers,E & Z systemof nomenclature.

Unit- III Alkanes and Cycloalkanes:

IUPAC nomenclature of branchedand unbranched alkanes, the alkylgroup,classification of carbon atoms in alkanes. Isomerismin alkanes,sources, methods of formation (withspecial referencetoWurtz reaction,Kolbe reaction, Corey-House reaction anddecarboxylationof carboxylic acids), physical properties and chemical reactionsof alkanes. Mechanism of free radical halogenation of alkanes: Mechanism of free-radical, halogenations of alkanes: orientation, reactivity and selectivity.

Unit- IVArenes and Aromaticity:

Nomenclatureof benzene derivatives.The aryl group.Aromatic nucleus and side chain. Structure of benzene: Molecular formula and Kekule structure. Stabilityand carbon–carbon bond length of benzene, resonance structure, Aromaticity–theHückelrule, aromaticions.Aromatic electrophilic substitution reaction–general pattern of themechanism,role of$\sigma$and π complex. Mechanism of nitration , halogenation, sulphonationand Friedel- Crafts reaction. Ortho and para ratio.Birch reduction.

Suggested Books:

1. Stereo Chemistry by P.S. Kalsi.
2. Organic Chemistry by Paula Yurkanis Bruice.
3. Reaction Mechanism by O. P. Aggarwal.
4. Organic Chemistry by F. A. Carey, Tata McGraw Hill.

5. Organic Chemistry by Robert T. Morrison & Robert N. Boyd, Prentice Hall of India Pvt. Ltd.
6. Stereo Chemistry of Organic Compounds by Ernest L Eliel, Tata McGraw-Hill.

PRACTICAL SYLLABUS

Title: ORGANIC CHEMISTRY LAB

Course Code– AUBSEI.2P

List of Experiments:

1. Qualitative Analysis.
2. Detection of elements.
3. Detection and identification of functional groups.
4. Determination of melting point.
5. Determination of boiling point.

Evaluation Scheme of Practical Examination:

Internal Evaluation (20 marks)
Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 4-point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

PRACTICAL PER FORMANCE &VIVA DURING THE SEMESTER (20MARKS)				**TOTAL**
EXPERIMENT (05 MARKS)	FILE WORK (05MARKS)	ATTENDANCE (05MARKS)	VIVA (05MARKS)	INTERNAL (20 MARKS)

External Evaluation (30 Marks)

The external evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

Experiment	**File work**	**Viva**	**Total**
(10 MARKS)	(10 MARKS)	(10 MARKS)	(30 MARKS)

CORE COURSE-3A ZOOLOGY

Title: ANIMAL DIVERSITY PART-I (PROTOZOA TO ANNELIDA)
Course Code– AUBSEI.3B

Credits 05 (4L+0T+1P)	**Max. Marks: 150 (Theory: 100 Practical: 50)**
Contact hours per week: 06	**Internal: 60 (Theory: 40 Practical: 20)**
Exam duration: 03:00 Hrs (Each T & P)	**End Term Exam: 90 (Theory: 60 Practical: 30)**

Objective:

The objective is to give students basic idea of the lower invertebrates through taxonomy of different phylum flower invertebrates and by educating them on the fundamental of structural organization, physiologies and life histories of different life forms fall in this category.

Outcome: As an outcome we are expecting the students will understand and learn the differences in the cellular organization of the organism at different levels and they will be able to write and draw the structure of various organisms.

Course Content:

Unit I Taxonomy:-

Classification of Protozoa. Porifera, Coelenterata, Platyhelminthes and Nematoda up to order with examples. Fundamentals of body organization emphasizing symmetry, metamerism, coelom and levels of structural organization.

Unit II Protozoa:-

Study of structural organization and life history of *Trypanosoma* and *Paramecium*. Study of locomotion, osmoregulation, nutrition and reproduction in protozoa. Parasitism, pathogenecity and control in protozoa with special reference to *Entamoeba*, *Giardia*, *Leishmania*, *Trichomonas* and *Plasmodium*.

Unit III Porifera: -

Habit, habitat, structure and function of *Sycon*. Types of canal system.
Coelenterata:-Habit, habitat, structure, function and life history of Aurelia. Polymorphism in coelenterata, coralreef. **Ctenophora –**Structural organization and affinities.

Unit IV Platyhelminthes:-

Structural organization and life history of *Fasciola* & *Taenia* Parasitic adaptations in Helminthes. Nematyhelminthes:- Study of structure and life history of *Ascaris* Nematode parasites and human diseases.

Classification of Annelida (up to sub class); metamerism and coelom in Annelida General account and types of Annelida (earthworm) structural organization, Physiology & life history of *Nereis*, Trochophore larva.

Recommended Texts:

1. Kotpal R.L, Invertebrates, Rastogi Publications, Meerut (2018).
2. Sabharwal, A. Invertebrates-I, Modern Publishers, New Delhi (2015).
3. Barrington, E.J.W. Invertebrate Structure and Functions. Houghton Mifflin Co. Boston. (1967).

***** Latest editions of all the suggested books are recommended.

PRACTICAL SYLLABUS

Title: ANIMAL DIVERSITY PART-I (PROTOZOA TO ANNELIDA)LAB

Course Code– AUBSEI.3BP

LIST OFEXPERIMENTS:

Generalsurveyof Invertebrate(Spot& Slides)

(A)**Protozoa:-**
Entamoeba,*Polystomella*,*Monocystis*,*Euglena*,*NoctilucaLeismania*,*Nyctotherus*,*Parameciu*m,*Vorticella*.**Porifera-***Sycon*,*Hyalonema*,*Euplectella*,*Spongilla*and*Euspongia*.**Coelenterate-***Obelia*colony(polyp&medusa)*Physalia*,*Porpita*,*Aurelia*,*Rhizostom*,*Alcyonium*,*Corallium,Gorgonia*,*Pennatula*,*Madrepora*.
Platyhelminthes:- *Dugesia*, *Fasciola*, *Taenia*, *Schistosoma*. **Nematode-** *Filaria*, *Dracunculus*,*Wuchereria*,*Enterobius.*

Annelida: -
Nereis (Heroneriesw i t h p a r a p o d i a)*A p h r o d i t e* ,*A r e n i c o l a* ,*P o n t o b d e l l a* , *H i r u d i n a r i a* ,*Peripatus*.

(B) Studyof TS/LSoforgans&developmental stages.
(i)**Porifera: -**T.S. of *Sycon*. (ii) **Coelenterata-** Planula larva of jellyfish.
(iii)**Platihelminthes-**
T.Sof*Fasciola*,scolexof*Taenia*,mature&gravidsegmentof*Taenia*,Hexacanth,bladderworm&cysticercusstageof*Taenia*,miracidium,sporocyst,redia,circarialarvaof*Fasciola*.
(iv)**Annelida-**T.S throughdifferentregion of leach.

(C)DissectionThroughchart / model / Photograph / CD.– *Hirudinaria* –
Morphology,generalanatomy,digestion,nervous&excretoryand reproductive system.
Earthworm – Anatomy,morphology,digestive and nervoussystem.
(D) Mounting-(Permanent)

Protozoa–*Euglena*,*Parameciu*m, *Polystomela*Porifera-Spicules,fibres,gemmuleCoelenterata-*Obelia*medusa.
Platyhelminthes –*Taenia*(proglotid)Annelida –*Nereis*(parapodia).

Evaluation Scheme of Practical Examination:
Internal Evaluation (20 marks)
Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 4-point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

PRACTICAL PER FORMANCE &VIVA DURING THE SEMESTER (20MARKS)				**TOTAL**
EXPERIMENT (05 MARKS)	FILE WORK (05MARKS)	ATTENDANCE (05MARKS)	VIVA (05MARKS)	INTERNAL (20 MARKS)

External Evaluation (30 Marks)
The external evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

Experiment	**File work**	**Viva**	**Total**
(10 MARKS)	(10 MARKS)	(10 MARKS)	(30 MARKS)

ABILITY ENHANCEMENT COMPULSORY COURSE-1A
(AECC-1A) ENGLISH

Title: COMMUNICATIVE ENGLISH-1
(Proficiency in English)
Course Code: AUBSEI.4

Credits: 2 (2L+0T+0P) **Max. Marks: 50**
Contact hours per week: 02 **Internal: 20**
Exam duration: 1:50 Hrs **End Term Exam: 30**

Objectives: Students will develop proficiency in English which will equip them to:

- understand the demands of audience, subject, situation and purpose and the use of language for effective communication.
- analyse language in context to gain an understanding of grammar, vocabulary, spelling, punctuation and speech.
- examine authentic literary and non-literary texts and develop insight and appreciation.
- gain an understanding of study and reference skills.
- plan, draft, edit and present a piece of writing.

COURSE CONTENT:

Unit I: Descriptive Grammar

1. Tenses:
a) Simple Present: Habitual action, General truths, Future time, Verbs of state, Verbs of perception, Verbs of sensation, Narration, Use of simple present for demonstration and commentaries, Present perfect, present perfect continuous, Present continuous also indicative of future action.
b) Simple past: Past time reference, Present time reference, Future time reference, Past continuous, Past perfect, past, perfect continuous.

2. Function of Auxiliaries; Modals; Question form
Articles, Preposition, Phrasal verbs, Synonyms, Antonyms.
Clauses: Noun Clause; Reported Speech and Change of Voice.

Unit II: Skills in Communication

1. Negotiating a point of view – learning to talk persuasively so as to get across one's perspective.
2. Debating on an issue – agreeing / disagreeing.

References:

1. Block, C.C. (1997). Teaching the Language Arts, 2nd Ed. Allyn and Bacon
2. Mckay. et. al. (1995). The Communication Skills Book, 2nd Ed. New Harbinger Publications.
3. Hornby,A.S.(2001).Oxford Advanced Learner's Dictionary, OUP
4. Thomsan,A.J. & Martinet.(2002).A Practical English Grammar.OUP
5. Mckay. et al. (1995). The Communication Skills Book, 2nd Ed. New Harbinger Publications.
6. Stone Douglas (1999). Difficult conversations: How to discuss what Matters Most, New York.: Penguin Books.

GENERIC ELECTIVE-1A (GE-1A)
ENVIRONMENTAL SCIENCE/ EDUCATION

Title: ENVIRONMENTAL SCIENCE/ EDUCATION-1
Course Code: AUBSEI.5

Credits: 02 (2L+0T+0P) | **Max. Marks: 50**
Contact hours per week: 02 | **Internal: 20**
Exam duration: 1:50 Hrs | **End Term Exam: 30**

Objective: To create awareness among students about environment protection.

Course Content

Unit-I

Environmental studies: Definitions and scope of Environmental Studies. Multidisciplinary nature of Environmental studies. Concept of sustainability & sustainable development.

Ecology and Environment: Concept of an Ecosystem-its structure and functions, Energy Flow in an Ecosystem, Food Chain, Food Web, Ecological Pyramid & Ecological succession,

Unit II

Natural Resources: Renewable &Non-Renewable resources; Land resources and land use change; land degradation, Soil erosion &Deforestation.

Biodiversity: Definition: genetic, species and ecosystem diversity, Conservation, Importance and Factors Responsible for Loss of Biodiversity, Bio-geographical Classification of India.

Text Books:

1. "Environmental Chemistry", De, A. K., New Age Publishers Pvt. Ltd.
2. "Introduction to Environmental Engineering and Science", Masters, G.M. Prentice Hall India Pvt. Ltd.
3. "Fundamentals of Ecology", Odem, E. P., W. B. Sannders Co.

Reference Books:

1. "Biodiversity and Conservation", Bryant, P. J., Hypertext Book.
2. "Textbook of Environment Studies", Tewari, Khulbe &Tewari, I. K. Publication.

PROFESSIONAL EDUCATION-1 (PE-1)

Title: CHILDHOOD AND DEVELOPMENT YEARS

Course Code– AUBSEI.6

Credits: 04 (3L+1T+0P)
Contact hours per week: 04
Exam duration: 3:00 Hrs

Max. Marks: 100
Internal: 40
End Term Exam: 60

Course Objectives:

- Understand the meaning, nature and scope of educational psychology.
- Understand growth and development of the learner and its importance in the learning process.
- Understand the need and problems of adolescence.
- Identify educational needs of various types of children
- Understand concept of intelligence and personality, theories of intelligence and personality and their educational implications.

UNIT 1: Child Development

- Educational Psychology: Meaning, Nature, Scope and Role of Educational Psychology in Teaching-Learning Process.
- Concept of Growth, Maturation and Development.
- Principles of Growth and Development.
- Heredity and Environment: Concept, Importance of Heredity and Environment in Child's Development.

Unit 2: Managing Individual Differences

- Individual Differences: Meaning, Dimensions (Cognitive Abilities,Interest, Aptitude, Creativity, Personality, Emotions, Values, Attitudes, Study Habits Psycho-motor Skills, Self-concept and Gender).
- Causes of Individual Differences (Race, Sex, Heredity, Social, Economic Status, Culture, Rural-Urban Home, Language Spoken and Language of Instruction).
- Characteristics, Identification and Remedial Measures for diverse learners (Creative, Slow, Gifted Learners, Learners with Specific Learning Disabilities).
- Role of Teacher to minimize Individual Differences.

Unit 3: Social, Emotional and Moral Development

- Social Development: Meaning, Stages and Factors affecting Social Development, Characteristics of Social Development during Childhood and Adolescence.
- Emotional Development: Meaning, Factors affecting Emotional Development, Characteristics of Emotional Development during Childhood and Adolescence.
- Moral Development: Meaning, Stages (Kohlberg), Factors affecting Moral Development, Characteristics of Moral Development during Childhood and Adolescence.
- Childhood and Adolescence: Meaning, Characteristics, Problems of Adolescence Period.

UNIT 4: Cognitive and Personality Development

- Cognitive Development: Meaning, Factors affecting Cognitive Development, Characteristics of Cognitive Development during Childhood and Adolescence.
- Theories of Cognitive Development (Piaget and Bruner).
- Personality Development: Meaning, Factors affecting Personality, Developmental Stages of Personality (Views of Sigmund Freud and Allport).
- Adjustment: Meaning, Types and Factors affecting Adjustment, Symptoms of Maladjustment and Role of the Teacher.

Activities (Any one of the following)

1. Prepare a report of administration and interpretation of any one psychological test,selecting one from: Personality/Adjustment/Mental Health.
2. Visit to a school and write a report on problems being faced by the students.
3. Administration of an individual test and preparing a report.

Suggested Readings

1. Aggarwal, J.C (1994). Essentials of Educational Psychology. New House Delhi: Vikas Public House.
2. Berk, L.E (2012). Child Development (6th Ed.) New Delhi: Prentice Hall of India.
3. Bhatnagar, S. (1980). Psychological Foundations of Teaching Learning and Develop Meerut: Loyal Book Depot.

SECOND SEMESTER

CORE COURSE-1B BOTANY

Title: DIVERSITY OF MICROBES AND CRYPTOGAMS (BRYOPHYTA, PTERIDOPHYTA AND PALEOBOTANY)
Course Code– AUBSEII.1B

Credits 05 (4L+0T+1P) **Max. Marks: 150 (Theory: 100 Practical: 50)**
Contact hours per week: 06 **Internal: 60 (Theory: 40 Practical: 20)**
Exam duration: 03:00 Hrs (Each T & P) **End Term Exam: 90 (Theory: 60 Practical: 30)**

Course objectives:

- To make students capable of differentiation between different classes of Bryophyta.
- To impart knowledge about advancement of characters in Pteridophyta with respect to Bryophyta.
- To make students well versed with the Geological timescale.

Outcomes:

- Students will learn about the general characters of Bryophyta.
- Students will learn the general characters of Pteridophyta
- Students will learn the basic concept of fossil Bryophyta through Geological time scale.

Course Content:

Unit I

Bryophyta: General characteristics and classification of bryophyta, alternation of generation.

Unit II

Structure, reproduction and economic importance of Hepaticopsida. Riccia, Marchantia, Anthoceratopsida - Anthoceros, Bryopsida-Sphagnum, funaria.

Unit III

Pteridophyta: The first vascular land plant , classification of Pteridophyta, important characteristics of Psilopsida, Lycopsida,Sphenopsida, and Pteropsida, types of stele. General characters of Selaginella, Equisetum, Adiantum and Marsilea.

Unit IV

Gymnosperm:-General characteristics, classification, General characteristics of Cycas, Pinus, Ephedra.

Recommended Texts:

1. Pandey S. N. & others.1995, A Text Book of Botany Vol. I, Vikas Publications Delhi.
2. Pandey S.N. & others.1995, A Text Book of Botany Vol. II, Vikas Publications Delhi.

PRACTICAL SYLLABUS

Title: DIVERSITY OF MICROBES AND CRYPTOGAMS (BRYOPHYTA, PTERIDOPHYTA AND PALEOBOTANY) LAB
Course Code– AUBSEII.1BP

LIST OF EXPERIMENTS:

1. Study of External morphology and microscopic preparations of following bryophytes: Riccia, Marchantia, Anthoceros, Sphagnum and Polytrichum.
2. Microscopic temporary, double stained preparations and study of stem/cone/sporocarp of Lycopodium, Selaginella, Equisetum, Adiantum and Marsilea.
3. Study of External morphology and microscopic preparations of following gymnosperm: Cycas, Pinus and Ephedra.

Evaluation Scheme of Practical Examination:

Internal Evaluation (20 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 4-point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

PRACTICAL PER FORMANCE &VIVA DURING THE SEMESTER (20MARKS)				**TOTAL**
EXPERIMENT (05 MARKS)	FILE WORK (05MARKS)	ATTENDANCE (05MARKS)	VIVA (05MARKS)	INTERNAL (20 MARKS)

External Evaluation (30 Marks)

The external evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

Experiment	**File work**	**Viva**	**Total**
(10 MARKS)	(10 MARKS)	(10 MARKS)	(30 MARKS)

CORE COURSE-2B CHEMISTRY

Title: INORGANIC CHEMISTRY

Course Code– AUBSEII.2

Credits 05 (4L+0T+1P) **Max. Marks: 150 (Theory: 100 Practical: 50)**
Contact hours per week: 06 **Internal: 60 (Theory: 40 Practical: 20)**
Exam duration: 03:00 Hrs (Each T & P) **End Term Exam: 90 (Theory: 60 Practical: 30)**

Objectives :

- To understand and appreciate the development of various atomic theories.
- To develop an understanding of principles of Atomic structure.
- To justify the need for quantum mechanical structure of atoms.
- To develop an understanding of the periodic trends, preparation and uses of s- and p-block elements and their compounds in terms of structure and bonding.
- To understand the nature of bonding and to predict the shapes of molecules.
- To construct MO energy level diagrams and predict the properties of molecules.

Course Content:

Unit-I Atomic Structure:

Dual nature of matter; de Broglie concept. Heisenberg's uncertainty principle; its significance. Atomic orbitals, Schrödinger wave equation (noderivation); significance of ψ and ψ^2. Quantum numbers, radial and angular wave functions and probability distribution curves, shapes of s, p and d orbitals. Aufbau's principle and its Limitations Pauli's exclusion principle. Hund's rule of maximum multiplicity. Electronic configuration of elements (s, p block and first series of d-block elements). Effective nuclear charge.

Unit-II Periodic Properties:

Atomic and ionic radii, ionization potential, electron affinity, electronegativity - definition, methods of determination/ evaluation, trends of variation in periodic table and their application in prediction and explaining the chemical behavior of elements and compounds.

Unit-III Chemical Bonding:

Covalent bond-valence bond theory and its limitations; various types of hybridization and shapes of different inorganic molecules and ions. Valence shell electron pair repulsion theory (VSEPR) and shapes of NH_3, H_2O, H_3O^+, SF_4, ClF_3 and other simple molecules/ ions. Molecular orbital theory as applied to diatomic homonuclear/ heteronuclear (CO and NO) inorganic molecules, difference between VB and MO theories.

Unit-IV s-Block and p-Block elements:

s-Block elements: General discussion with respect to all periodic and chemical properties, diagonal relationship, salient features of hydrides, salvation and complexation tendencies, Role of alkali and alkaline earth metal ions in bio-systems.

p-Block elements: General discussion and comparative study (all periodic and chemical properties including diagonal relationship) of groups 13 to 17 elements; chemistry of elements-hydrides, oxides &oxy-acids, and halides. Diborane – properties &structure, borohydrides, carbides, fluorocarbons, inter-halogen compounds, polyhalides and basic properties of iodine.

Suggested Books:

1. Concise inorganic Chemistry 4th Edn. By J.D.Lee .ELBS.

2. Huheey, J.E. Inorganic Chemistry, Prentice Hall 1993.
3. Cotton, F.A. and Wilkinson, G, Advanced Inorganic Chemistry, Wiley, VCH, 1999.
4. Greenwood, N.N. and Earnshaw, Chemistry of the Elements, Butterworth-Heinemann. 1997.
5. Day, M.C. and Selbin, J. Theoretical Inorganic Chemistry, ACS Publications 1962.
6. Douglas, B.E. and Mc Daniel, D.H., Concepts & Models of Inorganic Chemistry, Oxford 1970.
7. Shriver & Atkins, Inorganic Chemistry, Third Edition, Oxford Press 1994.
8. H.W. Porterfield, Inorganic Chemistry, Second Edition, Academic Press, 2005.

PRACTICAL SYLLABUS

Title: INORGANIC CHEMISTRY LAB

Course Code– AUBSEII.2P

List of Experiments:

1. Qualitative analysis.
2. Analysis of mixtures.
3. Dry tests or Preliminary tests.
4. Wet and Confirmatory tests for acid radicals.
5. Systematic wet analysis for basic radicals.

Evaluation Scheme of Practical Examination:

Internal Evaluation (20 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 4-point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

PRACTICAL PER FORMANCE &VIVA DURING THE SEMESTER (20MARKS)				TOTAL
EXPERIMENT (05 MARKS)	FILE WORK (05 MARKS)	ATTENDANCE (05MARKS)	VIVA (05MARKS)	INTERNAL (20 MARKS)

External Evaluation (30 Marks)

The external evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

Experiment	File work	Viva	Total
(10 MARKS)	(10 MARKS)	(10 MARKS)	(30 MARKS)

Reference text:

1. Vogel,A.I.*A Textbook of Quantitative Inorganic Analysis*, ELBS.

*Latest editions of all the suggested books are recommended.

CORE COURSE-3B ZOOLOGY

Title: ANIMAL DIVERSITY: HIGHER NON-CHORDATA
Course Code– AUBSEII.3B

Credits 05 (4L+0T+1P) **Max. Marks: 150 (Theory: 100 Practical: 50)**
Contact hours per week: 06 **Internal: 60 (Theory: 40 Practical: 20)**
Exam duration: 03:00 Hrs (Each T & P) **End Term Exam: 90 (Theory: 60 Practical: 30)**

Objective: The objective is to give students the exposure of some higher invertebrate phylum like Arthropoda, Mollusca and Echino dermata and the life histories of the organism fall in this category. To make them understand about the structure and function of the cells and differences.

Outcome: The outcome will be in terms of understanding the body organization of different life forms in higher invertebrates and they will be able to explain the differences in the taxonomic characters of different phylum. Students can draw and write about the structure and functions of the cells.

Course Content:

UNIT-I

Taxonomy: General Characters and Classification of Arthropoda, Mollusca and Echinodermata up to order, Mouthparts of insects, economic importance of insects.

UNIT-II

Arthropoda: Habit, habitat, morphology, physiology, reproduction, development of ***Palaemon*** (Prawn). ***Pariplaneta*** (cockroach).

UNIT-III

Mollusca: Habit, habitat, morphology, physiology, reproduction, developmentof *Pila* (Applesnail).

Unit-IV

Echinodermata: Habit, habitat, morphology, physiology, reproduction, and development of *Asterias (*Star fish).

Recommended books:

1. Kotpal R. L, Invertebrates, Rastogi Publications, Meerut (2009).
2. Sabharwal, A. Invertebrates-II, Modern Publishers, New Delhi (2015).
3. Barrington, E.J.W. Invertebrate Structure and Functions. Houghton Mifflin Co. Boston. (1967).

PRACTICAL SYLLABUS

Title: ANIMAL DIVERSITY: HIGHER NON-CHORDATA LAB

Course Code– AUBSEII.3BP

LIST OFEXPERIMENTS:

Observation of the following slides/spotters/models

Arthropoda: *Palaemon, Lepas, Crab, Lobester, Squilla, Balanus, Apis, Lepisma, Apis, Limulus,Scolopendra,Peripleneta*.

Mollusca:*Lamellidense,Pila,Chiton,Teredo,Doris,Aplysia,Detalium,Nautilus,Sepia.*

Echinodermata: *Pentacerous, Echinis, Ophiothrix, Holothuria, Antidon.*

Slides:

Mouth parts of *Anopheles* (male and female), *Culex* (male and female), *Cyclops*, *Dephnia*, *Zoea*larva.

Cell structure.

Activity: Preparation of onion root tip for the stages of mitosis.

Rexene Charts

1. Prawn nervous system.
2. Prawn digestive system.
3. *Pila* nervous system.
4. *Unio* nervous system.
5. Starfish water vascular system.

Evaluation Scheme of Practical Examination:

Internal Evaluation (20 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 4-point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

PRACTICAL PER FORMANCE &VIVA DURING THE SEMESTER (20 MARKS)				TOTAL
EXPERIMENT (05 MARKS)	FILE WORK (05MARKS)	ATTENDANCE (05MARKS)	VIVA (05MARKS)	INTERNAL (20

External Evaluation (30 Marks)

The external evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

Experiment	File work	Viva	Total
(10 MARKS)	(10 MARKS)	(10 MARKS)	(30 MARKS)

ABILITY ENHANCEMENT COMPULSORY COURSE-1B

(AECC-1B) ENGLISH

Title: COMMUNICATIVE ENGLISH-2

(Proficiency in English)
Course Code: AUBSEII.4

Credits 2 (2L+0T+0P)	**Max. Marks: 50**
Contact hours per week: 2	**Internal: 20**
Exam duration: 1:50 Hrs	**End Term Exam: 30**

Objectives : Students develop proficiency in English which equips them to:

- understand the demands of audience, subject, situation and purpose and the use of language for effective communication.
- analyse language in context to gain an understanding of grammar, vocabulary, spelling, punctuation and speech.
- examine authentic literary and non-literary texts and develop insight and appreciation.
- gain an understanding of study and reference skills.
- plan, draft, edit and present a piece of writing.

COURSE CONTENT:

Unit I: Study, Reference Skills and Skills of Communication

Note making; Note- taking; Summary writing. Comprehension Skills Extracts from literary, scientific and educational journals.

Advanced Writing Skills, writing advertisement copy; Writing a project proposal and Writing Resume, sending an application. Listening effectively; Talking about one self (likes, dislikes, interests, beliefs, personality traits, ambitions); Expressing an opinion about personal belief on a current issue. (Ability to speak fluently for 3-4 minutes. Focus would be on organized, logical, sequential presentation of thought through spontaneous speech).

Unit II: Writing for Functional Purposes; Creative Skills in Writing and Basic Phonetics

Letter-writing (Professional / Personal)

Writing dialogues, poems and essays

Sounds of English language, intonation and transcription using IPA.

Suggested Activities:

Politeness competitions- students with partners take turns in using a given number of utterances for negotiation / requests/complaints/small talk.
Students introduce themselves though using symbols/ metaphors.
Students collect newspaper/magazine cuttings on topical and/ or cultural issues of interest-write and share their opinion with peers.

References:

1. Chan. et al. (1997) Professional Writing Skills, San Anselma, CA
2. Fiderer, A. (1994) Teaching Writing: A Workshop Approach. Scholastic.
3. Block, C.C. (1997). Teaching the Language Arts, 2nd Ed. Allyn and Bacon
4. Mckay. et al. (1995). The Communication Skills Book, 2nd Ed. New Harbinger Publications.
5. Merrriam, E. (1964). It Doesn't Always Have to Rhyme. Atheneum.

6. Hyland, Ken (2004) Second Language Writing. University of Michigan Press.
7. Graves, D (1992). Explore Poetry: The reading /writing teacher's companion. Heinemann
8. Stone Douglas (1999). Difficult conversations: How to discuss what Matters Most, New York.: Penguin Books.
9. Gabor Don (2001). How to start a Conversation and Make Friends, New York: Fireside.
10. Block, C.C. (1997). Teaching the Language Arts, 2nd Ed. Allyn and Bacon
11. Mckay. et al. (1995). The Communication Skills Book, 2nd Ed. New Harbinger Publications.
12. Hornby,A.S.(2001).Oxford Advanced Learner's Dictionary, OUP

GENERIC ELECTIVE-1B (GE-1B)
ENVIRONMENTAL SCIENCE/ EDUCATION

Title: ENVIRONMENTAL SCIENCE/ EDUCATION-2

Course Code–AUBSEII.5

Credits 2 (2L+0T+0P) | **Max. Marks: 50**
Contact hours per week: 2 | **Internal: 20**
Exam duration: 1:50 Hrs | **End Term Exam: 30**

Objective: To create awareness among students about environment protection.

Course Content

Unit I

Environmental Pollutions: Types, Causes, Effects & control; Air, Water, soil & noise pollution, Nuclear hazards & human health risks, Solid waste Management; Control measures of urban & industrial wastes, pollution case studies

Climate change & Global Warming (Green house Effect),Ozone Layer-Its Depletion and Control Measures, Photochemical Smog, Acid Rain: Environment protection Act; air prevention &control of pollution act, Water Prevention &Control of Pollution Act,

Unit II

Human Communities &Environment:

Human population growth; impacts on environment, human health &welfare, Disaster Management; Earthquake, Floods &Droughts, Cyclones &Landslides, Environmental Ethics; Role of Indian &other religions &culture in environmental conservation, Environmental communication &public awareness; Case studies.

Text Books:

1. "Environmental Chemistry", De, A.K., New Age Publishers Pvt. Ltd.
2. "Introduction to Environmental Engineering and Science", Masters, G. M. Prentice Hall India Pvt. Ltd.
3. "Fundamentals of Ecology", Odem, E. P., W. B. Sannders Co.

Reference Books:

1. "Biodiversity and Conservation", Bryant, P. J., Hyper text Book
2. "Textbook of Environment Studies", Tewari, Khulbe & Tewari, I .K. Publication.

PROFESSIONAL EDUCATION-2 (PE-2)

Title: LEARNING AND TEACHING

Course Code–AUBSEII.6

Credits: 4 (3L+1T+0P)
Contact hours per week: 4
Exam duration: 3:00 Hrs

Max. Marks: 100
Internal: 40
End Term Exam: 60

Course objectives:

The student teachers will be able to:

1. Understand the nature, characteristics of learner and principles to make teaching-learning effective and productive.
2. Explain the concept, nature of learning as a process and conditions of learning.
3. Describe the Gagne's types of learning.
4. Explain the concept, types and strategies to develop memory.
5. Understand nature, causes, factors and strategies to minimize forgetting.
6. Apply the knowledge and understanding of the learning process, principles and theories of learning with their educational Implications.
7. Describe the concept, Importance and level of transfer of learning.

Unit 1 Learner and Learning

- Changing Nature of Learner, Characteristics of Effective Learner, Guiding Principles to make Teaching-Learning Effective and Productive.
- Concept and Nature of Learning as a Process, Learning Curve, Conditions of Learning -objective, subjective and methodological, Learning and Maturation.
- Gagne's Types of Learning, Events of Instruction, Learning Outcome.
- Memory - Concept, Types and Strategies to develop Memory; Forgetting - Nature, Factors and Strategies to Minimize Forgetting.

Unit 2 Understanding the Learning Process

- Learning: Meaning, Types and Levels of Concept Development, Strategies for Concept Learning.
- Learning through Association- Classical Conditioning, learning through Consequences - Operant Conditioning, learning through Trial and Error, learning through Observation Modeling/Observational Learning, Learning through Insight- Discovery Learning and their Educational implications.
- Social Constructivist Learning - Concept of Vygotsky, Educational Implications.
- Transfer of Learning: Concept, Types and Strategies to Maximize Transfer of Learning.

Unit 3 Teacher and Teaching

- Teacher: Qualities and Role in the Changing Scenario - Transmitter of Knowledge, Model, Facilitator.
- Concept of Teaching, Principles and Maxims of Teaching

- Teaching as a Profession: Meaning of Profession, Characteristics of a Profession, Professional Ethics for the Teachers, Role of Teacher Training in Developing Professionalism in Teachers Educators.
- Relationship between Teaching and Learning, Principles of effective Teaching and Learning.

Unit IV Phases and Models of Teaching

- Phases of Teaching: Pre-active, Interactive and Post Active. Operations involvedin each.
- Models of Teaching: Meaning, Need, Types and Elements of Model of Teaching, Basic Teaching Models (Glaser).
- Concept Attainment Model (Bruner) and Advance Organiser Model (Ausbel).
- Strategies of Teaching: Brainstorming, Simulation. Role Play and Gaming,

Activities - (Any one of the following)

1. A study of educational, social & cultural functions of any informal agency of education.
2. Prepare a report of educational problems of learners in any school.
3. Prepare a report of problem of SC/ST/Backward/ Minority group of children in the rural & urban area of Himachal Pradesh.

Suggested Readings

1. Bower, G H and Hilgard E R (1981) Theories of learning, Englewood Cliffs, New Jersey: Prentice Hall Inc.
2. Chauhan S.S. (1995) Advanced Educational Psychology, New Delhi: Vikas Publishing House Pvt. Ltd.
3. Mangal S.K. 2005) Advanced Educational Psychology, New Delhi. Prentice Hall of India.
4. Dandapani S. (2005). Advanced Educational Psychology, New Delhi: Anmol Publications.
5. NCERT (2005) National Curriculum Framework, New Delhi.
6. NCTE (2009) National Curriculum Framework for Teacher Education, New Delhi.

THIRD SEMESTER

CORE COURSE-1C BOTANY

Title: PLANT TAXONOMY AND EMBRYOLOGY

Course Code– AUBSEIII.1B

Credits 05 (4L+0T+1P) **Max. Marks: 150 (Theory: 100 Practical: 50)**
Contact hours per week: 06 **Internal: 60 (Theory: 40 Practical: 20)**
Exam duration: 03:00 Hrs (Each T & P) **End Term Exam: 90 (Theory: 60 Practical: 30)**

Course Objectives:

- To make students understand about the Botanical gardens and Herbarium.
- To make students aware about the different classification of Angiosperms.
- To impart knowledge about general characteristics of members of Angiosperm family.

Outcomes:

- Students will earn the systematic position of flowering plants.
- Students will be able to do identification of plants using scientific classification.
- Students will earn to describe the general leaf, flower and fruit characteristics of members of the Angiosperm family.

Course Content:

Unit I: Introduction To Plant Taxonomy

- Fundamental components of taxonomy (identification, nomenclature, classification).
- Taxonomic resources: Herbarium-functions & importantherbaria, Botanical gardens, Flora.
- Botanical Nomenclature-Principles and rules of ICBN (ranks and names; principle of priority, binomial system; type method, authorcitation, valid-publication).

Unit II: Classification

- Types of classification-Artificial, Natural and Phylogenetic.
- Bentham &Hooker's system of classification-merits and demerits.
- Engler &Prantle's system of classification-merits and demerits.

Unit III

- Systematic study and economic importance of the following families: Annonaceae, Brassicaceae, Rutaceae, Curcurbitaceae, and Apiaceae.
- Systematic study and economic importance of plants belonging to the following families: Asteraceae, Asclepiadaceae, Lamiaceae, Ephorbiaceae, Arecaceae, and Poaceae.

Unit IV: Embryology

- Anther structure, microsporogenesis and development of male gametophyte.
- Ovule structure and types; Megasporogenesis, development of Monosporic, Bisporic and Tetrasporic types (*Peperomia ,Drusa, Adoxa*) of embryosacs.
- Pollination and Fertilization (out lines) Endosperm development and types.
- Development of Dicot and Monocot embryos, Polyembryony.

Recommended Texts:

- Porter, C. L.: Taxonomy of flowering Plants, Eurasia Publishing house, New Delhi.
- Lawrence, G. H. M. (1953): Taxonomy of Vascular Plants, Oxford &IBH Publishers, New Delhi.

- Bhojwani, S. S. &Bhatnagar, S. P.(2000): The Embryology of Angiosperms (4th Edition). Vikas Publishing House (P) Ltd., UBS Publisher's Distributors, New Delhi.
- Maheswari, P(1963): Recent Advances in the Embryology of Angiosperms (Ed.,) International Society of Plant Morphologists- University of Delhi.
- Maheswari, P.(1985): An Introduction to the Embryology of Angiosperms Tata McGraw Hill Publishing Co., Ltd., New Delhi.

Latest editions of all the suggested books are recommended.

PRACTICAL SYLLABUS

Title: PLANT TAXONOMY AND EMBRYOLOGY LAB

Course Code– AUBSEIII.1BP

LIST OF EXPERIMENTS:

1. Systematic study of locally available plants belonging to the families prescribed in theory syllabus.
2. Demonstration of herbarium techniques.
3. Structure of pollen grains using whole mounts (*Hibiscus, Acacia*, Grass).
4. Demonstration of Pollen viability test using *in-vitro* germination (*Catharanthus*).
5. Study of ovule types and developmental stages of embryo sac using permanent slides/Photographs.
6. Structure of endosperm (nuclear and cellular); Developmental stages of dicot usingpermanent slides /Photographs.
7. Field visits .Study of local flora and submission of Field Note Book.

Evaluation Scheme of Practical Examination:

Internal Evaluation (20 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 4-point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

PRACTICAL PER FORMANCE &VIVA DURING THE SEMESTER (20MARKS)				**TOTAL**
EXPERIMENT (05 MARKS)	FILE WORK (05MARKS)	ATTENDANCE (05MARKS)	VIVA (05MARKS)	INTERNAL (20 MARKS)

External Evaluation (30 Marks)

The external evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

Experiment	**File work**	**Viva**	**Total**
(10 MARKS)	(10 MARKS)	(10 MARKS)	(30 MARKS)

CORE COURSE-2C CHEMISTRY

Title: PHYSICAL CHEMISTRY

Course Code– AUBSEIII.2

Credits 05 (4L+0T+1P) **Max. Marks: 150 (Theory: 100 Practical: 50)**
Contact hours per week: 06 **Internal: 60 (Theory: 40 Practical: 20)**
Exam duration: 03:00 Hrs (Each T & P) **End Term Exam: 90 (Theory: 60 Practical: 30)**

Unit-I Gaseous States: Postulates of kinetic theory of gases, deviation from ideal behavior, vander Waal's equation of states, relationship between critical constants and Vander Waals constants, reduced equation of state. Molecular velocities: Root mean square, average and most probable velocities, qualitative discussion of the Maxwell's distribution of molecular velocities.

Liquid State: Intermolecular forces, structure of liquids (a qualitative description) Structural differences between solids, liquids and gases. Physical properties of liquids including their methods of determination: surface tension, viscosity and refractive index.

Unit-IISolid State: Definitionofspacelattice, unitcell,crystalplanes, Millerindices,Lawsofcrystallography–(i)law of constancyofinterfacialangels(ii)lawofrationalityofindices(iii)law ofsymmetry.Symmetry elementsincrystals,X-raydiffractionbycrystals,. DerivationofBragg'sequation.Determination of crystalstructureof NaCl, KCl and CsCl (Laue'smethodandpowdermethod).

Unit-IIIChemicalKinetics: Chemical kinetics and its scope, rate of a reaction,factors influencingthe rate of a reaction– concentration,temperature,pressure,solvent,light,catalyst.Concentration dependence ofrates mathematicalcharacteristicsofsimplereaction –zeroorder,firstorder,secondorder,pseudo order,halflifedetermination oftheorderofreaction–differentialmethod, method ofhalflifeperiod andisolation methodsconcept ofactivation energy.

Unit-IVThermodynamics: Definitionof thermodynamicterms,system,surroundingsetc.typesof systems,intensiveand extensiveproperties,thermodynamicprocess, concept ofheatandwork, Firstlaw ofthermodynamics,definitionofinternalenergyandenthalpy. Heatcapacity–heatcapacitiesat constant volumeandatconstantpressureandtheirrelationship, Joule – Thomson coefficient and inversion temperature, Standardenthalpy offormation–Hess'slaw ofheat summation anditsapplication,Enthalpy of neutralization, bond dissociation energyand itscalculation fromthermochemical data, Kirchoff'sequation.

Suggested Books:

1. Physical Chemistry by S.C.Khetarpal, G.S, Sharma and R.K. Kalia.
2. A text Book of Physical Chemistry by K.K.Sharma and I.K. Sharma.
3. Physical Chemistry by P.N.Kapil and S.K.Guglani.
4. A text book of Biophysical Chemistryby U.N.Das.
5. Surface Chemistry by Adison,L.I.Osipow.
6. Atkins, P. W. & Paula, J. de Atkin's Physical Chemistry 8th Ed., Oxford University Press (2006).
7. Ball, D. W. Physical Chemistry Thomson Press, India (2007).
8. Castellan, G. W. Physical Chemistry 4th Ed. Narosa (2004).

PRACTICAL SYLLABUS

Title: PHYSICAL CHEMISTRY LAB

Course Code– AUBSEIII.2P

List of Experiments:

1. Measurement of density.
2. Measurement of surface tension.
3. Measurement of viscosity.

Evaluation Scheme of Practical Examination:

Internal Evaluation (20 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 4-point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

PRACTICAL PER FORMANCE &VIVA DURING THE SEMESTER (20MARKS)				**TOTAL**
EXPERIMENT (05 MARKS)	FILE WORK (05 MARKS)	ATTENDANCE (05MARKS)	VIVA (05MARKS)	INTERNAL (20 MARKS)

External Evaluation (30 Marks)

The external evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

Experiment	**File work**	**Viva**	**Total**
(10 MARKS)	(10 MARKS)	(10 MARKS)	(30 MARKS)

Reference text:

1. Vogel,A.I.*A Textbook of Quantitative Inorganic Analysis*, ELBS.

*Latest editions of all the suggested books are recommended.

CORE COURSE-3C ZOOLOGY

Title: CHORDATA
Course Code– AUBSEIII.3B

Credits 05 (4L+0T+1P)	**Max. Marks: 150 (Theory: 100 Practical: 50)**
Contact hours per week: 06	**Internal: 60 (Theory: 40 Practical: 20)**
Exam duration: 03:00 Hrs (Each T & P)	**End Term Exam: 90 (Theory: 60 Practical: 30)**

Objective: Theobjectiveistogiveanideaof theChordataandtheirfiveclasses.Toteachthestudentsaboutthechordateanimalslikefishes,amphibians, aves,reptilesandmammalsandsome oftheirbehavioranddifference instructuresandlifehistories.

Outcome: Uponthecompletionofthesemesterthestudentsareexpectedtoexplaintaxonomyofdifferentclassesandtheirdifference.Thephysiology,structureand lifehistoriesofanimalsfallin thiscategory.

CourseContent:

UNIT I

Urochordata: Classificationanddetailedstudy(Habit,Morphology,anatomy,Physiology,) of*Herdmaina.*

Cephalochordata: Classificationanddetailed studyof*Branchiostoma* (Amphioxus).

UNIT II

Pisces: GeneralcharactersandclassificationofPisces(uptoorderswithexamples)Parental careinfishes.

Amphibia: Generalcharactersandclassificationof amphibia (uptoorderswithexamples)Parental careinamphibia.

UNIT III

Reptilia:

GeneralcharactersandclassificationofReptilia(uptoorderswithexamples)IdentificationofPoisonousandnon-poisonoussnakes.Bitingmechanism ofpoisonoussnakes.

Unit IV

Aves: GeneralcharactersandclassificationofAves(uptoorderswithexamples)Characters of Archaeopteryx,Flightadaptation in Birds.

Mammals: GeneralcharactersandclassificationofMammaliauptoorders.DentitioninMammals.

Recommended books:

1. Kotpal R.L,Vertebrates, Rastogi Publications, Meerut (2018).
2. Kent, G. C. and Carr, R. K. (2001), Comparative Anatomy of the Vertebrates 9th edition,McGraw Hill Higher Education, New York.

PRACTICAL SYLLABUS

Title: CHORDATA LAB
CourseCode:AUBSEIII.3BP

LIST OFEXPERIMENTS:

Study of Specimens:

Urochordata– Herdmania, salpa doliolum.

Cephalochordata– Amphioxus.

Cyclostomata –petromyzon, myxine.

Pisces–*Pristis*, *torpedo*, *notopterus*, *exocoetus*, *clarius*, *ophiocephalus* , *catla*, *rohu* , *mrigal*
Amphibia–*Ichthyophis*, *bufo*, salamander, *uraeotyphlus*, *necturus*, *hyla*,*rhacophorus.*
Study ofpermanent slide:
Balanoglossus sections through probossiss, collar,branchiogenital and hepatic region**Amphioxus–** oral hood, whole mount sectionthroughpharyngeal, intestinal&caudalregion,Temporaryunstained preparation of placoid, cycloid and ctenoidscales.

Evaluation Scheme of Practical Examination:

Internal Evaluation (20 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 4-point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

PRACTICAL PER FORMANCE &VIVA DURING THE SEMESTER (20 MARKS)				**TOTAL**
EXPERIMENT (05 MARKS)	FILE WORK (05MARKS)	ATTENDANCE (05MARKS)	VIVA (05MARKS)	INTERNAL (20

External Evaluation (30 Marks)

The external evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

Experiment	**File work**	**Viva**	**Total**
(10 MARKS)	(10 MARKS)	(10 MARKS)	(30 MARKS)

ABILITY ENHANCEMENT COMPULSORY COURSE-2A (AECC-2A)
HINDI

Title: GENERAL HINDI-1
Course Code: AUBSEIII.4

Credits: 02 (2L+0T+0P) | **Max. Marks: 50**
Contact hours per week: 02 | **Internal: 20**
Exam duration: 1:50 Hrs | **End Term Exam: 30**

उदेश्य-

- छात्रो में भाषा को समझने तथा मूल्यांकन करने की दृष्टि बढ़ाना
- शब्द संरचना प्रक्रिया के प्रति छात्रों का ध्यानाकर्षण कराना
- छात्रों को प्रयोजनमूलक हिन्दी की व्यापकता से अवगत करवाना
- हिन्दी भाषा की व्यवहारिक उपयोगिता का परिचय देना

इकाई-1हिंदी ध्वनियों का स्वरूप

स्वर और व्यंजन

संज्ञा,सर्वनाम,क्रिया,विशेषण,क्रिया विशेषण

वाक्य संरचना

इकाई-2 हिंदी शब्द संरचना

पर्यायवाची,समानार्थक,विलोमार्थक,अनेकार्थक, अनेक शब्दों के स्थान पर एक शब्द, समुहार्थक शब्दों के प्रयोग, निकात्तार्थी शब्दों के सूक्ष्म अर्थ -भेद, समानार्थक शब्दों के भेद, उपसर्ग, प्रत्यय

PROFESSIONAL EDUCATION-3 (PE-3)

Title: LANGUAGE ACROSS THE CURRICULUM

Course Code– AUBSEIII.5

Credits: 02 (1L+1T+0P)
Contact hours per week: 02
Exam duration: 1:30 Hrs

Max. Marks: 50
Internal: 20
End Term Exam: 30

Course Objectives:

The student teachers will be able to:

1. Understand the nature, importance and use of Language.
2. Acquaint with some latest methods and approaches for planning of successful language teaching.
3. Identify and be sensitive to the proficiency, interests and needs of learners.
4. Practice learner centered methods and techniques in the classroom.
5. Use technology to enrich language teaching,
6. Encourage continuous professional development.

UNIT 1 - LANGUAGE AND SOCIETY

- Meaning, Nature and Scope of Language, Role of Language in life: Intellectual,Emotional, Social, Literary and Cultural Development.
- Characteristics of Language Development.
- Factors affecting Language Learning: Physical, Psychological and Social.
- Theories of Language: Divine Gift Theory, the Pooh or the Interjectional Theory. The Ding-Dong Theory. The sing- song Theory, The Ta - Ta Theory, The Babble- Luck Theory. The Tongue-Tie Theory.

UNIT 2 - CURRICULAR PROVISIONS, POLICIES FOR LANGUAGE EDUCATION AND DEVELOPMENT OF LANGUAGE SKILLS

- Position of Languages in India; Article 343-351,350A; of Constitution of India.
- Kothari Commission (1964-66): NPE-1986; POA-1992; National Curriculum of India.Framework-2005 (Language Education), NCFTE - 2009 (Language Education).
- Meaning, Importance and Need for development of Language Skills.
- Approaches to Language Learning: Traditional Method, Textbook Method, Communicative Method, Grammar-cum-Translation Method, Principles and Maxims of Language Learning.

Activities (Any One of the following):

1. Discuss 'Multilingualism as a Resource.
2. Analyze advertisements aired on Radio Television on the basis of language andgender,
3. Analyze few passages from Science, Social Science and Maths textbooks of Classes VI to VII and Write a Report based on Following Issues
    a) how the different registers of language have been introduced
    b) Does the language clearly convey the meaning of the topic being discussed?
    c) Is the language learner-friendly?
    d) Is the language too technical?
    e) Does it help in language learning?

SUGGESTED READINGS

1. Valdmen (1987) Trends in Language Teaching, New York, London: Mcgraw Hill.

2. Johnson, K (1983): Communicative Syllabus Design and Methodology. Oxford: Pergamon press
3. Sharma, KL.(2012): Methods of Teaching English in India, Agra, lakshmi Narain Agarwal Publisher
4. Kohli, A.L: Techniques of Teaching English, New Delhi: Dhanpat Rai Publisher.
5. Geéta Rai (2010): Teaching of English, Meerut: R. LAL book DEPOT.
6. Praveen Sharma (2008): Teaching of English language, Delhi: Shipra Publications.
7. Joseph Mukalel C. (2011). Teaching of English Language, New Delhi: DiscoveringPublishing House.
8. Sharma Yogendra K. Sharma Madhulika (2011): Teaching of English Language, New Delhi: Kanishka Publishers, Distributors.
9. Sharma R.A. (2007): Teaching of English Education, Meerut: A. Lall Book Depot.
10. Mangal, U. (2010) Teaching of Hindi, New Delhi: Arya Book Depot.
11. National Curriculum Frame Work (2005), New Delhi: NCERT.

PROFESSIONAL EDUCATION-4 (PE-4)

Title: TEXT READINGS AND REFLECTIONS

Course Code– AUBSEIII.6

Credits: 02 (1L+1T+0P)
Contact hours per week: 02
Exam duration: 1:30 Hrs

Max. Marks: 50
Internal: 20
End Term Exam: 30

Course objectives: The student teachers will be able to:

1. Learn to read Newspaper Follow Radio, TV & Internet media critically and with understanding.
2. Form and exchange viewpoints on political and social Issues.
3. Distinguish fact, fiction and opinion in Newspaper articles.
4. Develop teachers professionally and support their aspirations as teachers.

UNIT-1 Analytical and Critical Thinking

- Analytical and Critical Thinking: Meaning and Importance for Reading and Writing.Role of Critical Reading and Critical Thinking in Enhancing Writing Skills.
- Ways of Developing Reading Skills, Importance of Developing Reading Skills; Reading Aloud and Silent Reading; Extensive Reading, Study Skills including using Thesaurus, Dictionary, Encyclopedia.
- Ways of developing Writing Skills: Formal and Informal Writing (such as Poetry, Short Story, Letter, Diary, Notices, Articles, Reports, Dialogue, Speech and Advertisement.

UNIT-II Pedagogies of Reading and Writing

- Models for Assessing the components of Reading (Phonemic Awareness, Phonics, Fluency, Vocabulary, and Text Comprehension).
- Instructional Approaches for Developing Students' Concepts of Grammar, Punctuation, Spelling and Handwriting.
- Responding to the Texts: Approach to Response Based Study (The Core of the Text, Personal Connection. Reading Beyond the Text, Revisiting the Text).
- Responding to the Contexts: Sharing Responses (Purpose of Sharing. Role of the Teacher and Benefits of Sharing)

ACTIVITIES (Any one of the following):

1. Writing a review or a summary of the text with comments and opinion.
2. Student teacher will select news paper/magazine articles on topics of contemporary issues.
3. REFLECTION EXERCISES:
    a) Why did this particular (event, barrier, success, accident) happen?
    b) What was the best thing I did and Why?
    c) If I did this again tomorrow, what would I do differently?

SUGGESTED READINGS:

1. Alberta Learning (2003), Responding to Text and Context, Senior High School English Language Arts Guideto Implementation. Alberta, Canada. Retrieved from https://education.alberta.ca/media/883678/4_respond.pdf.
2. Cottrell Stella (2011) Critical Thinking Skills: Developing Effective Analysis and Argument (Palgrave study skills) Basingstoke: Palgrave Macmillan
3. Cox, Ailsa (2005) Writing Short Stories (English) London: Routledge.
4. Fisher Alec (2001) Critical Thinking:An Introduction, UK: Cambridge University press.
5. Fitkids T.J. (2011) Common Mistakes in English (With Exercises), New Delhi: Jain Book Agency.

FOURTH SEMESTER

CORE COURSE-1D BOTANY

Title: PLANT PHYSIOLOGY AND METABOLISM

Course Code– AUBSEIV.1B

Credits 05 (4L+0T+1P) **Max. Marks: 150 (Theory: 100 Practical: 50)**
Contact hours per week: 06 **Internal: 60 (Theory: 40 Practical: 20)**
Exam duration: 03:00 Hrs (Each T & P) **End Term Exam: 90 (Theory: 60 Practical: 30)**

Course Objectives:

- To make students capable of understanding basic physical processes occurring in plants.
- To impart Knowledge about plant growth regulators related to growth and development.
- To make student learn about the Mineral nutrition in plants.

Learning Outcomes:

- Students will learn about the physical processes occurring in plants.
- Students will learn the function of different plant growth regulators.

Course Content:

Unit 1: Plant-water relations

Importance of water, water potential land its components; Transpiration and its significance; Factors affecting transpiration; Root pressure and guttation.

Unit 2: Mineral nutrition and Translocation

Essential elements, macro and micronutrients ;Criteria of essentiality of elements; Role of essential elements, Transportations across cell membrane, active and passive transport, carriers, channels and pumps.
Translocation in phloem.: Composition of phloem sap, girdling experiment; Pressure flow model; Phloem loading and unloading

Unit 3: Photosynthesis and Respiration

Photosynthetic Pigments (Chlab, xanthophylls, carotene); Photosystem I and II, reaction center, Electron transport and C3, C4 and CAM pathways of carbon fixation.
Respiration: glycolysis, anaerobic respiration, TCA cycle; Oxidative phosphorylation.

Unit 4: Enzymes and Nitrogen metabolism

Structure and properties; Mechanism of enzyme catalysis and enzyme inhibition. Nitrogen metabolism: Biological nitrogen fixation; Nitrate and ammonia assimilation.

Plant growth regulators and Plantresponse to light and temperature

Discovery and physiological roles of auxins, gibberellins, cytokinins, ABA, ethylene.
Plant response to light and temperature: Photoperiodism (SDP, LDP, Dayneutralplants); Phytochrome (discovery and structure), redand far red lightresponses on photomorphogenesis; Vernalization.

Recommended books:

1. Hopkins, W.G., Huner, N.P., (2009). Introduction to Plant Physiology. John Wiley & Sons, U.S.A. 4th Edition.
2. Bajracharya, D., (1999). Experiments in Plant Physiology-A Laboratory Manual. Narosa Publishing House, New Delhi.

3. Taiz, L., Zeiger,E., MØller,I.M. and Murphy,A. (2015). Plant Physiology and Development. Sinauer Associates Inc. USA. 6th edition.

PRACTICAL SYLLABUS

Title: PLANT PHYSIOLOGY AND METABOLISM LAB

Course Code– AUBSEIV.1BP

LIST OFEXPERIMENTS:

1. To prepare a temporary mount of onion bulb peel and study structure of its cells.
2. To determine the stomatal index (S.I) on abaxial and adaxial surface of the leaf.
3. To demonstrate the stomatal transpiration by four leaves method.
4. Study the cells of onion and spirogyra.
5. To demonstrate the phenomenon of osmosis through plasma membrane of a plant material by using Potato osmoscope.
6. To determine the water absorption and transpiration ratio by absorb transpirometer.
7. To demonstrate the growth of plant by Arc auxanometer.
8. To study the rate of transpiration by Ganong's photometer method.
9. To separate the chloroplast pigments by paper chromatography.
10. To demonstrate the phenomenon of imbibition pressure by using dry seeds.
11. To study the germination of gram seeds.
12. Separation of amino acids by paper chromatography.

Evaluation Scheme of Practical Examination:

Internal Evaluation (20 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 4-point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

PRACTICAL PER FORMANCE &VIVA DURING THE SEMESTER (20MARKS)				**TOTAL**
EXPERIMENT (05 MARKS)	FILE WORK (05MARKS)	ATTENDANCE (05MARKS)	VIVA (05MARKS)	INTERNAL (20 MARKS)

External Evaluation (30 Marks)

The external evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

Experiment	**File work**	**Viva**	**Total**
(10 MARKS)	(10 MARKS)	(10 MARKS)	(30 MARKS)

CORE COURSE-2D CHEMISTRY

Title: ORGANIC & INORGANIC CHEMISTRY

Course Code– AUBSEIV.2

Credits 05 (4L+0T+1P) **Max. Marks: 150 (Theory: 100 Practical: 50)**
Contact hours per week: 06 **Internal: 60 (Theory: 40 Practical: 20)**
Exam duration: 03:00 Hrs (Each T & P) **End Term Exam: 90 (Theory: 60 Practical: 30)**

Unit - I

Cycloalkanes: Nomenclature, methodsof formation, chemical reactions, Baeyer's strain theory and its limitations. Ringstraininsmall rings (cyclopropane and cyclobutane),theory of strainlessrings.

Aldehydes and Ketones: Nomenclature and structure of Carbonyl gropus, Synthesis of Aldehydes and Ketones with particular reference to the synthesis of Aldehydes from acid chlorides, Synthesis of Aldehydes and Ketones using 1,3 dithianes, Synthesis of Ketones from Nitriles and from Carboxylic acids.

Aldol, Perkin and Knoevenegel Condensations, Wittig reaction, Mannich reaction. Cannizaro reaction, Clemmensen , Wolff-kishner, $LiAlH_4$ and $NaBh_4$ reduction.

Unit-II

Alcohols: Classification and nomenclature

Monohydric alcohols- nomenclature, methods of formation by reduction of aldehydes, ketones, carboxylic acids and esters. Hydrogen bonding, Acidic nature, reactions of alcohols.

Phenols: Nomenclature structure and bonding, preparation of phenols, physical properties and acidic character. Comparative acidic strength of alcohols and phenols, mechanism of Fries rearrangement, Claisen rearrangement, Gatterman synthesis and Reimer-Tiemann synthesis.

Unit- III

Non-Aqueous Solvents: Introduction to non-aqueous solvents, their classification, effect of physical properties of the solvents on the role of solvent in chemical reactions, solvent system concept of acids and bases, studies of NH_3HF, H_2SO_4 and SO_2 as non-aqueous solvents, failure of solvent system concept and coordination model of non-aqueous solvents.

Unit-IV

Structures of diamond and graphite, Inorganic compounds of carbon (CO,CO_2, CS_2, CCl_4, HCN, SIC), composition and theory of setting of cement, Catenation, silicate minerals, silanes, silicone polymers, comparison of C and Si. Allotrophy of P. Oxides and oxy-acids of both N and P. hydrides of N and P (NH_3, N2H4, NH_2OH, NH_3, P_2H_4 and PH_3). Ammonium sulphate and calcium ammonium nitrate (CAN) manufacture and uses. Oxides and oxyacids of S, hydrides and halides of sulphur. Oxides and oxyacids of halogens, hydrides of halogens.

Suggested Books:

1. Reaction and Mechanism by Singh & Mukherjee.
2. Organic Chemistry (Reaction and Mechanism) by P.S. Kalsi.
3. Finar, I. L. Organic Chemistry (Volume 1), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
4. Finar, I. L. Organic Chemistry (Volume 2: Stereochemistry and the Chemistry of Natural Products), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
5. Organic Chemistry by Paula Yurkanis Bruice.
6. Organic Chemistry by Baeyer and Walter.
7. Concise inorganic Chemistry 4th Edn. By J.D.Lee.
8. Inorganic Chemistry by J.E.Huheey.
9. Advanced Inorganic Chemistry byCotton And Wilkinson.
10. Chemistry of Elements by Greenwood &Earnshaw.
11. Theoretical Inorganic Chemistry By Day & Selbin.

PRACTICALSYLLABUS

Title: ORGANIC & INORGANIC CHEMISTRY LAB

Course Code– AUBSEIV.2P

List of Experiments:

1. Estimation of Barium and Sulphate ions.
2. Estimation of Iron.
3. Inorganic preparation of Prussion Blue $Fe_4[Fe(CN)_6]_3$.
4. Inorganic preparation of Tetra-amine copper (II), Sulphate-Tetra ammonium Cupric sulphate $[Cu(NH_3)_4]SO_4H_2O$.
5. Inorganic preparation of Chrome alums $K_2SO_4Cr_2(SO_4)_324H_2O$.

Evaluation Scheme of Practical Examination:

Internal Evaluation (20 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 4-point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

PRACTICAL PER FORMANCE &VIVA DURING THE SEMESTER (20MARKS)				**TOTAL**
EXPERIMENT (05 MARKS)	FILE WORK (05 MARKS)	ATTENDANCE (05MARKS)	VIVA (05MARKS)	INTERNAL (20 MARKS)

External Evaluation (30 Marks)

The external evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

Experiment	**File work**	**Viva**	**Total**
(10 MARKS)	(10 MARKS)	(10 MARKS)	(30 MARKS)

CORE COURSE-3D ZOOLOGY

Title: EVOLUTION AND DEVELOPMENTAL BIOLOGY

Course Code– AUBSEIV.3B

Credits 05 (4L+0T+1P)	**Max. Marks: 150 (Theory: 100 Practical: 50)**
Contact hours per week: 06	**Internal: 60 (Theory: 40 Practical: 20)**
Exam duration: 03:00 Hrs (Each T & P)	**End Term Exam: 90 (Theory: 60 Practical: 30)**

Objectives: Toeducatethestudentsontheconceptandtheoriesoftheevolutionandembryology.Thedevelopmentofchickand placentation.

Outcomes: Asanoutcomethestudentwillbeabletoexplainandwritethedifferenttheoriesgiventoexplaintheevolutionduringthetimeperiodlike DarwininsmandLamarkismandcanbeunderstandthedevelopmentalbiology.

CourseContent:

Unit –1

Concept of evolution. Evidences of natural selection,Theoryof evolution (includingNeo-Lamarckism,Darwin – Wallace theory of natural selection, Neo- Darwinism modern synthetic theory.

Unit-2

Gametogenesis: spermatogenesis and oogenesis, vitellogenesis egg membrane, Fertilization, Parthenogenesis.

Unit-3

Types of animal eggs: structure of eggs. Types and patterns of cleavage.

Unit -4

Process of blastulaion and gastrulation. Development of chick up to the formation of primitive streak and extra embryonic membrane. Development of extra embryonic membrane in mammals.Placentation and types of placenta.

Recommended books:

1. Gilbert,S.F.(2006), developmentbiology, VIIIedition, sinauerassociatesInc publishers,sunderland, Massachusetts, USA.
2. Balinsky,B.I.(2008) anintroduction to embryology,international Thomson computerpress.
3. Kalthoff,(2000)Analysis of biologicaldevelopment ,II edition, mc graw hill professional.
4. VermaP.S. &V.K. aggrawal, chordateembryology, s. Chand&co.
5. Berril&crop development biology.Mc Graw hill book company,m,c, NewYork.
6. Jain P.C. 1998, elements of development biology. Vishal publication , NewDelhi

PRACTICAL SYLLABUS

Title: EVOLUTION AND DEVELOPMENTAL BIOLOGY LAB

Course Code– AUBSEIV.3BP

LIST OFEXPERIMENTS:

1. **Reptiles–** studyof chamelon,*varanus*,pharynosoma ,*draco*,tortoise , cobra , Krait, Russel'sviper,sea snaketestuda.

1. *Hemidactytus*, *uromastix*,*ophiosaurus*,*hydrophis*, crocodiles.
2. **Birds–**studyof owl, woodpecker , kingfisher, kite , duck, parrot,studyof dozenbirdsofdelhi.
3. **Mammals–**studyof squirrel, mangoose,bat,loris, rabbit.

Developmentbiology

1. **Frog-** study of developmental stages & section through permanent slides cleavage , stage, blastula ,gastrula , neurulatadpole.
2. **Chick–** studyof developmentalstageprimitivestreak,-21h,24h , 28h,33h,36h, 48h, 72h.
3. Section of testis and ovary (mammalian).
4. Slides of mammalian sperm and ovum.

Evaluation Scheme of Practical Examination:

Internal Evaluation (20 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 4-point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

PRACTICAL PER FORMANCE &VIVA DURING THE SEMESTER (20 MARKS)				**TOTAL**
EXPERIMENT (05 MARKS)	FILE WORK (05MARKS)	ATTENDANCE (05MARKS)	VIVA (05MARKS)	INTERNAL (20

External Evaluation (30 Marks)

The external evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

Experiment	**File work**	**Viva**	**Total**
(10 MARKS)	(10 MARKS)	(10 MARKS)	(30 MARKS)

ABILITY ENHANCEMENT COMPULSORY COURSE-2B (AECC-2B)
HINDI

Title: GENERAL HINDI-2
Course Code: AUBSEIV.4

Credits: 02 (2L+0T+0P) **Max. Marks: 50**
Contact hours per week: 02 **Internal: 20**
Exam duration: 1:50 Hrs **End Term Exam: 30**

उदेश्य–

1. छात्रो में भाषा को समझने तथा मूल्यांकन करने की दृष्टि बढ़ाना
2. शब्द संरचना प्रक्रिया के प्रति छात्रों का ध्यानाकर्षण कराना
3. छात्रों को प्रयोजनमूलक हिन्दी की व्यापकता से अवगत करवाना
4. हिन्दी भाषा की व्यवहारिक उपयोगिता का परिचय देनाना

इकाई-1 वर्तनी, विराम चिन्ह एवं संशोधन

- वर्तनी सम्बन्धी अशुद्धियाँ, मात्राओ की अशुद्धियाँ
- वर्तनी सम्बन्धी अशुद्धियों के कारण, वर्तनी सम्बन्धी अशुद्धियों के सुधारने के उपाय
- विराम चिन्ह- पूर्णविराम, प्रश्नवाचक चिन्ह, सम्बोधन या आश्चर्य चिन्ह, निर्देशक चिन्ह, अवतरण चिन्ह

इकाई -2 लेखन सम्बन्धी कोशल

- लिखित भाषा शिक्षण के उद्देश्य
- लेखन की विभिन्न विधियों, लेखन के दोष
- निबंध लेखन, कहानी लेखन
- राष्ट्रीय - अंर्तराष्ट्रीय तात्कालिक घटनाक्रमों पर लेखन
- ओपचारिक पत्राचार / अनोपचारिक पत्राचार
- राष्ट्रीय - अंर्तराष्ट्रीय तात्कालिक घटनाक्रमों पर लेखन

PROFESSIONAL EDUCATION-5 (PE-5)

Title: UNDERSTANDING DISCIPLINES AND SUBJECTS

Course Code– AUBSEIV.5

Credits: 02 (1L+1T+0P) **Max. Marks: 50**
Contact hours per week: 02 **Internal: 20**
Exam duration: 1:30 Hrs **End Term Exam: 30**

Course objectives:

The student teachers will be able to:

1. Understand the nature of discipline and school subjects.
2. Differentiate between school subjects and curriculum.
3. Integrate and apply concepts and theories in real classrooms

UNIT-1: Concept of Discipline

- Nature and role of Discipline knowledge in School Curriculum.
- Paradigm shift in the nature of discipline, Emergence of School subjects and disciplines from Philosophical, Social and Political Contexts.
- Needed changes in the Discipline Oriented Text Books.

UNIT-2: Quality in Classroom Learning

- Indicators of Quality Learning.
- Teaching and Learning as Interactive Process.
- Major issues in classroom learning: Catering individual differences, student-teacher interaction in the classroom.
- Learning beyond text books- other sources of learning.

Activity (Any one of the following)

1. Prepare a report mentioning the changes required in current school level text books prescribed by CBSE or HPBSE.
2. Prepare a report highlighting major issues and concerns in teaching of Mathematics or English at secondary school stage.

SUGGESTED READINGS

1. Apple, M. (1978): Ideology and Curriculum, New York: Routledge.
2. Fuller, B. (2007): Standardized Childhood, Stanford, CA: Stanford University Press.
1. Romero-Little, M.E. (2006). Honoring Our Own: Rethinking Indigenous Languages and Literary. Anthropology and Education quarterly, *37*(4), 399-402.

PROFESSIONAL EDUCATION-6 (PE-6)

Title: GUIDANCE AND COUNSELING

Course Code– AUBSEIV.6

Credits: 02 (1L+1T+0P)
Contact hours per week: 02
Exam duration: 1:30 Hrs

Max. Marks: 50
Internal: 20
End Term Exam: 30

Course objectives:

The student- teachers will be able to:

1. Understand the meaning, objectives, need, scope and principles of guidance.
2. Develop counseling skills.
3. Organize guidance programme in the secondary schools.
4. Develop the skills to prepare case study, to diagnose and identify problems, prepare report and provide guidance accordingly.

Unit –I Concept of Guidance

- Guidance: Meaning, need and scope
- Objectives, principles, issues and problems of Guidance.
- Types of Guidance: Educational, Vocational and Personal. Role of school and Teacher in Guidance program.
- Testing Techniques (Intelligence, Aptitude, Personality Inventory and Achievement Test) and Non-testing Techniques (Observation, Interview, Case Study and Cumulative Record).

Unit –ll Counselling

- Meaning, Objectives, Principles of Counselling.
- Approaches of Counseling: Directive, Non-directive and Eclectic.
- Techniques of Counseling.
- Organization of Counseling in Schools and Role of Counselor.

Activities (any one of the following):

1. Interview of a school counsellor.
2. Visit to a guidance or counselling centre and write a report.
3. Administration of individual test and preparing a report.
4. To prepare a case study,
5. Conduct a survey of the problems that are most prevalent in school which needimmediate attention of a guidance counsellor and prepare a brief report.

SUGGESTED READINGS:

1. Aggarwal, J.C. Educational & Vocational dance and Counseling Aadhar. DoabaHouse
2. Bhatia, KK. (2002) Principles of Guidance & Counseling Ludhiana Kalyani Pub
3. MAsch. (2000) Principles of dance and Counseling New Delhi Sarup and Sons
4. Safaya, BN (2002) Guidance & Counseling Chandigarh. Abhishek Publications
5. Sharma, Tara Chand (2002) Modem Methods of Guidance and Counseling New Delhi, Sarup and Sons
6. Shertzer, Bruce and Stone, Shelly C. (1074) Fundamentals of Counseling London Houghton Miss
7. Shirley, AHarmin (1987) Guidance in Secondary Schools New Delhi NCERT.

FIFTH SEMESTER

CORE COURSE-1E BOTANY

Title: ECONOMIC BOTANY AND PLANT BIOTECHNOLOGY

Course Code– AUBSEV.1B

Credits 05 (4L+0T+1P) **Max. Marks: 150 (Theory: 100 Practical: 50)**
Contact hours per week: 06 **Internal: 60 (Theory: 40 Practical: 20)**
Exam duration: 03:00 Hrs (Each T & P) **End Term Exam: 90 (Theory: 60 Practical: 30)**

Course Objectives:

- To make students capable of understanding the centres of origin of different crops.
- To impart knowledge about economic importance of some cash crops.
- To makes student learn about the techniques in plant biotechnology.

Outcomes:

- Students will learn about the centres of origin of different crops.
- Students will learn the origin and plant parts used in some important cash crops.
- Students will learn the latest techniques in plant biotechnology.

Course Content:

Unit-I: Origin of Cultivated Plants:

Concept of centres of origin and diversity of cultivated plants, Vavilovian centres. Cereals : Rice -Origin, morphology, uses Legumes : General account with special reference to Gram and soybean.

Unit II: Spices and Beverages:

General account with special reference to clove and black pepper (Botanical name, family, part used, morphology and uses) Beverages: Tea (morphology, processing, uses).

Fat and Fibre yielding plants: General description with special reference to groundnut Fibre Yielding Plants: General description with special reference to Cotton (Botanical name, family, part used, morphology and uses).

Unit III: Introduction to Biotechnology

Plant tissue culture: Micropropagation; haploid production through androgenesis andgynogenesis; brief account of embryo and endosperm culture with their applications

Unit IV Recombinant DNA Techniques

Blotting techniques: Northern, Southern and Western Blotting,
DNA Finger printing ; Molecular DNA markers i.e. RAPD, RFLP,
SNPs; DNA sequencing, PCR.

Hybridoma and monoclonal antibodies, ELISA and Immuno detection. Molecular diagnosis of human disease, Humangene Therapy.

Recommended Texts:

1. Kochhar, S. L. (2011). Economic Botany in the Tropics, MacMillan Publishers India Ltd.,New Delhi. 4th edition.
2. Bhojwani, S. S. and Razdan, M. K., (1996). Plant Tissue Culture: Theory and Practice. Elsevier Science Amsterdam. The Netherlands.
3. Glick, B. R., Pasternak, J. J. (2003). Molecular Biotechnology-Principles and Applications of recombinant DNA. ASM Press, Washington.

PRACTICAL SYLLABUS

Title: ECONOMIC BOTANY AND PLANT BIOTECHNOLOGY LAB

Course Code– AUBSEV.1BP

LIST OF EXPERIMENTS:

1. Study of economically important plants: Wheat, Gram, Soybean, Blackpepper, Clove Tea, Cotton, Groundnut through specimens, sections and microchemical tests.
2. Familiarization with basic equipments in tissue culture.
3. Study through photographs: Antherculture, somatic embryogenesis, endosperm and embryo culture; micropropagation.
4. Study of molecular techniques: PCR, Blotting techniques, AGE and PAGE.

Evaluation Scheme of Practical Examination:

Internal Evaluation (20 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 4-point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

PRACTICAL PER FORMANCE &VIVA DURING THE SEMESTER (20MARKS)				**TOTAL**
EXPERIMENT (05 MARKS)	FILE WORK (05MARKS)	ATTENDANCE (05MARKS)	VIVA (05MARKS)	INTERNAL (20 MARKS)

External Evaluation (30 Marks)

The external evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

Experiment	**File work**	**Viva**	**Total**
(10 MARKS)	(10 MARKS)	(10 MARKS)	(30 MARKS)

CORE COURSE-2E CHEMISTRY

Title: PHYSICAL AND INORGANIC CHEMISTRY

Course Code– AUBSEV.2

Credits 05 (4L+0T+1P) **Max. Marks: 150 (Theory: 100 Practical: 50)**
Contact hours per week: 06 **Internal: 60 (Theory: 40 Practical: 20)**
Exam duration: 03:00 Hrs (Each T & P) **End Term Exam: 90 (Theory: 60 Practical: 30)**

Unit I

Second law of thermodynamics: Need for the law, Different statements of the law, Carnot cycle and its efficiency, Carnot theorem, Thermodynamics scale of temperature.

Third law of thermodynamics: Concept of entropy, variation of entropy with T and V, T and P, P and V_2, Nernst heat theorem, Evaluation of absolute entropy from heat capacity data, Entropy of real gaseous and application of third law.

Free energy and work Function: Gibb's function (G) and Helmohltz function (A) as thermodynamic state function, Maxwell relations, Standard free energies, Gibb's Helmholtz equation and its applications.

Unit II

Electrochemistry: Electrical transport-conduction in metals and in electrolyte solutions, Specific and molar conductivity variations of conductivity with concentration, Kohlrausch law, Arrhenius theory of electrolyte dissociation and its limitations, Weak and strong electrolytes, Transport number.
Electrolytic and Galvanic cells: Derivation of cell EMF, EMF of cell and its measurement, Elecrode potential, Standard Hydrogen electrode, Standard electrode potential, Sign conversions.
Definitions of pH and pKa values, determination of pH using Hydrogen, Buffers mechanism of buffer action, Henderson-Hazel equation, Hydrolysis of salts.

Unit-III

Metal-Ligand bonding in Transtions Metal Complexes: Electrostatic crystal field splitting of d-orbitals in octahedral, Tetrahedral, square planar and tetragonally distorted octahedral stereochemistry, Factors affecting the crystal filled parameters, CFSC, Spectro chemical series, Origin of diamagnetism, paramagnetism, ferromagnetism and antiferromagnetism, Types of magnetic behaviour shown by transition elements and compound, Gouy's method for measuring magnetic susceptibility, Origin of colour in transition metal complexes, Explanation of colour in $[Ti(H_2O)_6]Cl_3$ and $CuSO_4.5H_2O$ and lack of colour in $CuSO_4$ and $Cu_2\ SO_4$ in terms of d-orbital splitting.

Unit-IV

Organometallic Compounds and $\pi-$acid Complexes: Definition type and classification of organometallic compounds, EAN and nomenclature, Ionic metal carbon bonding, Metal carbon multiple bonding, Preparation and reaction of feerocene, Nature of bonding in Metal olefin and metal alkyne complexes. Formation of reaction in Carbonyl compounds of transition elements, Bonding in linear carbonyls (simple spectral evidence), structure of mono and polynuclear carbonyls.

Suggested Books:

1. Physical Chemistry by S. C. Khetarpal, G.S, Sharma and R. K. Kalia.
2. Physical Chemistry by P. N. Kapil and S. K. Guglani.
3. Castellan, G. W. Physical Chemistry 4th Ed. Narosa (2004).
4. Atkins, P. W. & Paula, J. de Atkin's Physical Chemistry 8th Ed., Oxford University Press (2006).
5. Ball, D. W. Physical Chemistry Thomson Press, India (2007).
6. Concise inorganic Chemistry 4th Edn. By J. D. Lee.
7. Inorganic Chemistry by J. E. Huheey.
8. Advanced Inorganic Chemistry by Cotton And Wilkinson.
9. Chemistry of Elements by Greenwood & Earnshaw.
10. Theoretical Inorganic Chemistry By Day & Selbin.

PRACTICAL SYLLABUS

Title: PHYSICAL AND INORGANIC CHEMISTRY LAB

Course Code– AUBSEV.2P

List of Experiments:

1. Thermodynamic: Heat of neutralization, Heat of solution.
2. Preparation of buffer solution and the determination of the pH values by the use of indicator.
3. $KMnO_4$ Titration.
4. Iodine Titration.
5. EDTA Titration.

Evaluation Scheme of Practical Examination:

Internal Evaluation (20 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 4-point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

PRACTICAL PER FORMANCE &VIVA DURING THE SEMESTER (20MARKS)				**TOTAL**
EXPERIMENT (05 MARKS)	FILE WORK (05 MARKS)	ATTENDANCE (05MARKS)	VIVA (05MARKS)	INTERNAL (20 MARKS)

External Evaluation (30 Marks)

The external evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

Experiment	**File work**	**Viva**	**Total**
(10 MARKS)	(10 MARKS)	(10 MARKS)	(30 MARKS)

CORE COURSE-3E ZOOLOGY

Title: CELL BIOLOGY AND GENETICS

Course Code– AUBSEV.3B

Credits 05 (4L+0T+1P) | **Max. Marks: 150 (Theory: 100 Practical: 50)**
Contact hours per week: 06 | **Internal: 60 (Theory: 40 Practical: 20)**
Exam duration: 03:00 Hrs (Each T & P) | **End Term Exam: 90 (Theory: 60 Practical: 30)**

Objectives:

Theobjectiveofthissemesteristoeducatestudentsoncellbiologyandgenetics.Structureandfunctionofcella ndothercellorganelleswillbetaughttothem.KnowledgeonMendel'sprinciplesongenetics,Structureofchr omosomes,DNAand RNA willbegiven tothem.

Outcomes:

Aftercompletionofthesemesterthestudentwillbeabletoexplainthegeneticsandhowthetraitstransfersfrom onegenerationtoanother. Theycanalsobeabletodrawandexplainthestructureofcelland cellorganelles.

Course Content:

Unit I: Structure and function of cell, Ultrastructure of Plasma membrane

Structure and function of cell organelles with special emphasis on mitochondria, golgi bodies, nucleus, ribosome and endoplasmic reticulum.

Unit II

Structureof Chromosomes,Watson&Crick Modelof DNA,Differencesbetween DNA &RNACell Division: Mitosisand Meiosis.

Unit III

Mendel's principles of heredity on chromosomal basis, Monohybrid cross, test cross, dihybrid cross, back cross, incomplete dominance, Multiple Alleles, Blood group inheritance.

Unit IV

Linkage and crossing over, interaction of genes. Role of DNA in heredity. Sex determination, sex differentiation, Sex-linked characters, Genetic diseases and abnormalities, chromosomal aberrations.

Recommended Texts:

1. DeRobertis, E.D.P. andDeRobertis,E.M.F. 2006 Cell andmolecular Biology8thedition lippincott williansandWilkins,Philadelphia.
2. GuptaP.K. GeneticsRastogipublicationMeerut.
3. Verma P.S.and V.K. Agarwal, Concept of cell Biology S Chand Publications.
4. Lodishet al :-molecular cell Biology(scientificAmerican book).
5. Veer Bala RastogiIntroduction to Cellbiology, Rastogi publicationMeerut.
6. Gene VI, Benjamin Lewin, Oxford University Press, U.K.
7. Latesteditions ofall the suggested books arerecommended.

PRACTICAL SYLLABUS

Title: CELL BIOLOGY AND GENETICS LAB

Course Code– AUBSEV.3BP

LIST OFEXPERIMENTS:

1. Microscopy – Theoretical knowledge of light and electron microscope.
2. 2- Study ofstructure of cellorganellesthroughelectron microscope.
3. Studyof mitosis and meiosis frompermanent slides
4. Preparationand studyofslides formitosis usingsquashtechnique(onion root tip).
5. Studyof hardy– Weinberglaw usingsimulations(seed).
6. Osteology – study of skeleton of fowl Axial skeleton, Appendicular skeleton.

Evaluation Scheme of Practical Examination:

Internal Evaluation (20 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 4-point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

PRACTICAL PER FORMANCE &VIVA DURING THE SEMESTER (20 MARKS)				**TOTAL**
EXPERIMENT (05 MARKS)	FILE WORK (05MARKS)	ATTENDANCE (05MARKS)	VIVA (05MARKS)	INTERNAL (20

External Evaluation (30 Marks)

The external evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

Experiment	**File work**	**Viva**	**Total**
(10 MARKS)	(10 MARKS)	(10 MARKS)	(30 MARKS)

PROFESSIONAL EDUCATION-7(PE-7)

Title: ASSESSMENT FOR LEARNING

Course Code– AUBSEV.4

Credits: 04 (3L+1T+0P) **Max. Marks: 100**
Contact hours per week: 04 **Internal: 40**
Exam duration: 3:00 Hrs **End Term Exam: 60**

Course Objectives:
The student-teachers will be able to;

1. Understand the nature of assessment and its role in teaching-learning process.
2. Understand the different perspectives of learning on assessment.
3. Realize the need for school-based assessment in schools.
4. Examine the contextual roles of different forms of assessment.
5. Understand the different dimensions of learning and the related assessment procedures, tools and techniques.

Unit-1 Perspectives on Assessment

- Concept of measurement, assessment, evaluation and their interrelationship.
- Purposes of Assessment: Prognostic, Monitoring of Learning. Providing Feedback, Selection, Promotion, Placement, Certification, Grading and Diagnostic.
- Classification of assessment: based on purpose (prognostic, formative, diagnostic and summative), nature of Interpretation (norm-referenced, criterion-referenced).
- Need for continuous and comprehensive school-based assessment: Grading: Concept, Types and Application Indicators for grading,

Unit 2 Assessment of Learning

- Dimensions of learning: cognitive, affective and performance.
- Assessment of cognitive learning: types and levels of cognitive learning: understanding and application. Thinking skills - convergent, divergent, critical, problem solving, decision making and procedures for their assessment.
- Assessment of affective learning: Attitudes, values, interests and procedures for their assessment.
- Assessment of Performance. Tools and techniques for assessment of skills.

Unit 3 Planning, Executing, Interpreting and Reporting of Assessment

- Construction/ Selection of test items: Guidelines for construction of test items.
- Guidelines for administration and scoring, Preparation of blueprint; Performing item analysis.
- Processing test performance: Calculation of percentages and central tendency measures: graphical representations; Analysis and interpretation of learners' performance; Reporting learners' performance - Progress report. Cumulative records, Portfolios.
- Means of providing remedial instruction for improving learning.

Unit 4 Issues, Concerns and Trends in Learning Assessment

- Existing Practices: Unit tests, half-yearly and annual examinations, semester system, Board examinations and Entrance tests, State and National achievement surveys, Use of question banks.
- Issues and Problems: Marking Vs. Grading. Non-detention policy, Objectivity Vs Subjectivity,

- Policy perspectives on examinations and assessment: Recommendations of NPE, 1986 and NCF, 2005.
- Trends in assessment and evaluation: Online examination, Peer assessment, Self-Assessment, Computer-based examinations and other technology-based assessment practices.

*** Activity (Any One of the Following):**

1. Construct an achievement test in any subject of your interest containing a minimum of 50 items with its marking scheme and scoring procedure, evaluation practices adopted by the school teachers.
2. Visit an elementary school and prepare a report on the assessment and prepare a report on the assessment and evaluation practices adopted by the school teachers.
3. Study the parameters / indicators followed in Continuous and Comprehensive Assessment System of CBSE and HP State Education Department. Prepare a critical report highlighting the similarities and differences in the two systems.
4. Visit a school and study how the progress reports and cumulative records of students are maintained by the teachers. Prepare a detailed report highlighting the content and format of students' progress reports and cumulative records.

***Suggested Readings:**

1. Bransford, J., Brown, AL, & Cocking. RR. (Eds.) (2000). How People Learn: Brain,
2. Mind, Experience, and School. Washington, DC: National Academy Press. Burke, K. (2005).
3. Nandra, Inder Dev Singh (2012). Learning Resources and Assessment of Leaming.Patiala: 21" Century Publications.
4. Natrajan and Kulshreshta S.P. (1983). Assessing Non-Scholastic Aspects-Learners Behaviour, New Delhi: Association of Indian Universities.
5. NCERT(1985) Curriculum and Evaluation, New Delhi.

PROFESSIONAL EDUCATION-8 (PE-8)

Title: ICT IN TEACHING-LEARNING PROCESS
Course Code– AUBSEV.5

Credits: 02 (1L+1T+0P) **Max. Marks: 50**
Contact hours per week: 02 **Internal: 20**
Exam duration: 1:30 Hrs **End Term Exam: 30**

Course objectives:
The student-teachers will be able to:

1. Understand the concept and role of ICT in construction of Knowledge.
2. Acquire knowledge and understanding about National Policy onEducation.
3. Identify the challenges in integration of ICT in school education.
4. Understand computer fundamentals.
5. Apply different Hardware Technologies in Modern Educational Practices.
6. Familiarize with the new trends in ICT.

UNIT I Introduction to ICT and ComputerFundamentals

- Concept of ICT: Meaning & Characteristics; Role of Information Technology in Construction of Knowledge.
- National Policy on ICT in School Education; Challenges in Integrating ICT in School Education.
- Computer Fundamentals: Meaning, Components & Types of Computer, Functions ofOperating System, Application Softwares.
- Computer Application in Learning: Concept, Features and Advantages of Word (WordProcessor); Excel (Spreadsheets) and PowerPoint (Slide Preparation & Presentation).

UNIT II ICT in Teaching - Learning Process

- Hardware Technologies and their Applications: Overhead Projector (OHP);Preparing Transparencies, Slide Projector, Audio-Video Recording Instruments.
- Hardware Technologies and their applications: DLP Projector, Movie Projector, Close Circuit Television (CCTV).
- New Trends in ICT: Concept, Elements and Advantages of Smart Classroom, EDUSAT.
- Internet & Online Learning Resources (e- Library, Websites, Web 2.0 Technology andOpen Educational Resources) in learning.

Activities (Any one of the following):

1. Prepare your Curriculum Vitae using computer and obtain its printout.
2. Visit an institution having interactive white board and learn its features and functioning and prepare a report.
3. Prepare a Powerpoint presentation for secondary school students.

Suggested Readings:

1. Barton, R.(2004), Teaching Secondary Science with ICT. New Delhi: McGraw-Hill International
2. Bhaskara Rao. Digumarti (2013): Vidya. SamacharaSankethikaSastram (ICT inEducation). Guntur masterminds, Sri Nagarjuna Publishers.
3. Denis, Kim, Sen and Morin (2000). Information Technology - The Breaking Wave New Delhi: Tata McGraw-Hill Publishing Co. Ltd.
4. Department of School Education and Literacy. MHRD (2012). National Policy on Information and Communication Technology (ICT) In School Education, New Delhi
5. Mangal, S.K. & Uma Mangal (2009). Essentials of Educational Technology. New Delhi PHI Learning P. Ltd.

PROFESSIONAL EDUCATION-9 (PE-9)

Title: INCLUSIVE SCHOOL
Course Code– AUBSEV.6

Credits: 02 (1L+1T+0P) | **Max. Marks: 50**
Contact hours per week: 02 | **Internal: 20**
Exam duration: 1:30 Hrs | **End Term Exam: 30**

Course Objectives:
The student teachers will be able to:

1. Understand the concept, nature and types of disabilities.
2. Identify the characteristics and need, identification of different types of disabled children.
3. Understand the concept, nature and approaches of inclusion in education.
4. Understand and reflect on models of inclusion in education.
5. Acquire knowledge and understanding about the provisions made for disabled children under SSA and RTE Act, 20096.
6. Understand different pedagogical and assessment techniques for inclusion of CWSN.
7. Employ different pedagogical approaches for inclusion of CWSN in regular schools.

Unit-1 Disabilities and Inclusion in Education

- Disability: Concept and Nature; Disabled Children: Types, Characteristics and their identification.
- Inclusion in Education: Meaning, Need, Scope and Advantages.
- Constitutional Provisions for Inclusion in Education: Sarva Shiksha Abhiyan and Right to Education Act, 2009. Infrastructural Facilities required for Inclusion in Schools: Concept of Resource Room.
- Approaches to Inclusion: Full Inclusion and Partial Inclusion; Models of Inclusion: Consultant Model, 3-Dimensional (3D) Model of Inclusion: Ways of Ensuring Community/Parents' Participation in Creating Inclusive Schools.

Unit - 2 Pedagogical and Assessment Approaches for Creating Inclusive Schools

- Pedagogical Approaches for CWSN: Curriculum Adaptation, Activity-based Learning, Developing Specially Designed Resource Materials, Collaborative and Cooperative Learning, Team Teaching.
- Assessment Approaches for CWSN: Observation, Continuous and Comprehensive Assessment (Formative and Diagnostic Assessment).
- Identifying Barriers to Learning and Participation of CWSN.
- Means of Providing Remedial Instruction and Feedback; Role of School Head and Teachers in Evolving Inclusive Practices and Developing Inclusive Values.

Activity (Any one of the following):

1. Visit a primary school in your locality and identity the pedagogical practices employed by the teachers for inclusion of CWSN. Prepare a detailed report highlighting pedagogical practices, their relevance and difficulties faced by teachers.
2. Visit a School where resource room has been established by the State Govt. Interact with the in-charge of resource room and prepare a report highlighting its layout, types of equipment and their usage by the teachers for imparting education in inclusive settings.

Suggested Readings:

1. Alur, Mithu and Bach, Michael (2009). The Journey for Inclusive Education in the Indian Sub-Continent. New York: Routledge.)
2. Das, Shankar and Kattumuri, Ruth (2013). Inclusive Education: AContextual Working Model. New Delhi: Concept Publishing Company)

3. Friend, M. and Bursuck, W. D. (1999), Including Students with Special Needs: A Practical Guide for Classroom Teacher. Boston: Allyn and Bacon.)
4. Mangal, S. K. (2009) Educating Exceptional Children: An Introduction to Special Education. New Delhi: Prentice Hall

SIXTH SEMESTER
CORE COURSE-1F BOTANY

Title: ENVIRONMENTAL BIOTECHNOLOGY
Course Code– AUBSEVI.1B

Credits 05 (4L+0T+1P) **Max. Marks: 150 (Theory: 100 Practical: 50)**
Contact hours per week: 06 **Internal: 60 (Theory: 40 Practical: 20)**
Exam duration: 03:00 Hrs (Each T & P) **End Term Exam: 90 (Theory: 60 Practical: 30)**

Course Objectives:

- To make students capable of understanding current environmental issues.
- To impart knowledge about role of Microbiology in treatment of waste.
- To make student learn about role of common people in Environment protection.

Learning Outcomes:

- Students will learn about the current environmental issues.
- Students will learn the roleof different microorganisms in treatment of waste.
- Students will learn how the public participation can help in protection environment.

Course Content:

Unit I

Environment

Basic concepts and issues, global environmental problems-ozone depletion, UV-B, green house effect and acid rain, their impact and approaches for management.

Environmental pollution-types of pollution, sources of pollution, measurement of pollution, methods of measurement of pollution, fate of pollutants in the environment, Bioconcentration, bio/geomagnification.

Unit II Microbiology of wastewater treatment and Xenobiotic compounds

Aerobic process-activated sludge, oxidation ponds, trickling filter, rotating drums, oxidation ditch. Anaerobic process-anaerobic digestion, anaerobic filters, upflow anaerobic sludge blanket reactors. Xeno biotic compounds**:** Bioremediation of xenobiotics in environment-ecological consideration, decay behavior and degradative plasmids, techniques in bioremediation, degradation of pesticides and hydrocarbons.

Unit III Role of immobilized cells/enzymesintreatment of toxic compounds

Biopesticides, bioreactors, bioleaching, biomining, biosensors, bio techniques for airpollution.

Unit IV Sustainable Development

Economics and Environment: Economic growthand quality of life, ,Economics of Pollution control, WTO and Environment, Corporate Social Responsibility, Environmental awareness and Education; Environmental Ethics. Public Participation for Environmental Protection.
Environmental movement and people's participation with special references to Gandhamardan, Chilikaand Narmada BachaoAndolan, Chipko and Silent valley Movement; Women and Environmental Protection, Role of NGO in bringing environmental awareness and education in the society.

Reference Books:

1. Waste water engineering treatment, disposal land reuse, Metcalf and Eddy

Inc.,
Tata McGraw Hill, New Delhi.
2. Environmental Chemistry, A. K. De, Wiley Eastern Ltd, New Delhi.
3. Introduction to Biodeterioration, D. Allsopp and K. J. Seal, ELBS/ Edward Arnold.
4. Bioremidation, Baaker, KH andHersonD.S., 1994. Mc. Graw Hill Inc, New York.
5. Environmental Molecular Biology, Paul. A, Rochelle, 2001. Horizon Press.
6. Environmental Protection and Laws by Jadhav and Bhosale, V. M. Himalaya publ. House.
7. Biodiversity Assessment and Conservation by P. C. Trivedi.

Latest editions of all the suggested books are recommended.

PRACTICAL SYLLABUS

Title: ENVIRONMENTAL BIOTECHNOLOGY LAB

Course Code– AUBSEVI.1BP

LIST OF EXPERIMENTS:

1. Water/Soilanalysis-DO, salinity, pH, total hardness, alkalinity, acidity.
2. Gravimetric analysis-Total solid, dissolved solid, suspended solid in an effluent.
3. Isolation and pure culture of microbial strains from air, water and soil sample.
4. Colony counting on nutrient agar media.
5. Measurement and optimization of microbial growth and kinetics.

Evaluation Scheme of Practical Examination:

Internal Evaluation (20 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 4-point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

PRACTICAL PER FORMANCE &VIVA DURING THE SEMESTER (20MARKS)				**TOTAL**
EXPERIMENT (05 MARKS)	FILE WORK (05MARKS)	ATTENDANCE (05MARKS)	VIVA (05MARKS)	INTERNAL (20 MARKS)

External Evaluation (30 Marks)

The external evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

Experiment	**File work**	**Viva**	**Total**
(10 MARKS)	(10 MARKS)	(10 MARKS)	(30 MARKS)

CORE COURSE-2F CHEMISTRY

Title: PHYSICAL AND ORGANIC CHEMISTRY

Course Code– AUBSEVI.2

Credits 05 (4L+0T+1P) **Max. Marks: 150 (Theory: 100 Practical: 50)**
Contact hours per week: 06 **Internal: 60 (Theory: 40 Practical: 20)**
Exam duration: 03:00 Hrs (Each T & P) **End Term Exam: 90 (Theory: 60 Practical: 30)**

Unit-I

Spectroscopy: Regions of spectrum, Born-Oppenheimer approximation, degree of freedom.

Rotational spectrum: Diaatomic Molecules, Energy level of rigid rotor, selection rules, Spectral intensity, Maxell-Boltzmann distribution, Qualitative description of non-rigid rotor, Isotope effect.

Vibrational spectrum: Infrared spectrum, Energy levels of simple harmonic oscillator, Selection rules, Pure vibratuional spectrum, Intensity, Determination of force constant and qualitative relation of force constant and bond energies, Effect of an harmonic motion and isotope on the spectrum, Idea of vibrational frequencies of different functional groups.

Electronic spectrum: Concept of potential energy curve for bonding and antibonding molecular orbital, qualitative description of selection rules and Franck-Condon principle.

Unit-II

Photochemistry: Interaction of radiation with matter, Difference between thermal and photo chemical processes.

Laws of photo chemistry: Grothus-Drapper law, Stark-Einstein law, Jablonsky diagram depicting various processes occurring in the excited states, Fluorescence, Phosphorescence, Photosensitized reactions-energy transfer processes.

Physical properties and molecular structure: Polarization-Clausius-Mossotti equation, Orientation of dipoles in an electric field, Magnetic properties ,Paramagnetism, Diamagnetism and Ferromagnetism.

Unit-III Spectroscopy: Ultraviolet (UV) absorption spectroscopy-absorption laws (Beer-Lambert law), Presentation and analysis of UV spectra, Types of electronic transition, Effect of conjugation, Concept of Chromophore and Auxochrome. Bathochromic, Hypsochromic and Hypochromic shift.

Infra-red (IR) absorption spectroscopy, Hook's law, selection rules, Position of IR bands, Measurement of IR spectrum, Finger print region, Characteristic absortion of various functional groups and interpretation of IR spectra of simple organic compound.

Nuclear magnetic resonance (NMR) spectroscopy, Proton magnetic resonance (^{1}HNMR) spectroscopy, Nuclear shielding and deshielding, Chemical shift, Spin-spin splitting and coupling constant. Interpretation of PMR spectra of simple organic molecules such as ethanol, acetaldehyde, 1,1,2-tribromomethane.

Unit-IV Photo chemistry and Heterocyclic Compounds

Scope and importance, Photochemical and Thermochemical reactions, Jablonski diagram.

Molecular orbital picture and aromatic characteristics of pyrrole, furan, thiophene and pyridine, Nucleophilic substitution reactions in pyridine derivatives, Comparison of basicity of pyridine, piperidine and pyrrole. Reactions of indole, quinoline and isoquinoline with special reference to

Fisher indole synthesis and Bischler-Napieralski synthesis, Mechanism of electrophilic substitution reaction of indole quinoline and iso quinoline.

Suggested Books:

1. Physical Chemistry by S. C. Khetarpal, G.S, Sharma and R.K. Kalia.
2. A text Book of Physical Chemistry by K. K. Sharma and I. K. Sharma.
3. Physical Chemistry by P. N. Kapil and S. K. Guglani.
4. Surface Chemistry by Adison, L. I. Osipow.
5. Organic Chemistry by Paula YurkanisBruice.
6. Organic Chemistry by F. A. Carey, Tata McGraw Hill.
7. Organic Chemistry by Robert T. Morrison & Robert N. Boyd, Prentice Hall of India Pvt. Ltd.

PRACTICAL SYLLABUS

Title: PHYSICAL AND ORGANIC CHEMISTRY LAB

Course Code– AUBSEVI.2P

List of Experiments:

1. Determination of molecular weight by Rast's method.
2. Study of Hydrolysis of Methyl Acetate in the presence of HCL acid at room temperature.
3. Identification of Sugar (Glucose, Fructose, Sucrose, Lactose) by paper Chromatography.
4. Qualitative analysis of Ions (Cu^{++}, Cd^{++}, Ni^{++}, and Co^{++}) by paper Chromatatography.

Evaluation Scheme of Practical Examination:

Internal Evaluation (20 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 4-point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

PRACTICAL PER FORMANCE &VIVA DURING THE SEMESTER (20MARKS)				**TOTAL**
EXPERIMENT (05 MARKS)	FILE WORK (05 MARKS)	ATTENDANCE (05MARKS)	VIVA (05MARKS)	INTERNAL (20 MARKS)

External Evaluation (30 Marks)

The external evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

Experiment	**File work**	**Viva**	**Total**
(10 MARKS)	(10 MARKS)	(10 MARKS)	(30 MARKS)

CORE COURSE-3F ZOOLOGY

Title: MAMMALIAN PHYSIOLOGY
Course Code– AUBSEVI.3B

Credits 05 (4L+0T+1P) **Max. Marks: 150 (Theory: 100 Practical: 50)**
Contact hours per week: 06 **Internal: 60 (Theory: 40 Practical: 20)**
Exam duration: 03:00 Hrs (Each T & P) **End Term Exam: 90 (Theory: 60 Practical: 30)**

Objectives: In thissemesterthestudentswillbeprovidedtheknowledgeofdifferentphysiologies.Theywillalso learn the mechanism ofdifferentorgansfunctions in thebody ofanimals.Eachphysiology willcomprisethestructureof centralorganandtheirfunctionsand whataretheirimportancein thelifeofanimal.

Outcomes: Onecanexpectedtolearntheprocessofphysiologylikedigestion,respiration,excretionandbloodcirculationetc.Theywillbeable todraw and writeallabouttheyhadlearnt.

CourseContent:

Unit-1

Biochemistry: structure and metabolism of carbohydrate, protein and lipids.

Unit-2

Nutrition and digestion: Histology and function of gastrointestinal tract and its associated glands.

Digestion and absorption of proteins, carbohydrates &lipids.

Respiration: Mechanism and regulation of breathing. Transport of oxygen and carbon dioxide.

Unit-3

Blood and circulation :Composition, structure and functions of blood. Coagulations of blood – blood group and Rh factor. Cardiac cycle, heart beat & its regulation. Blood pressure and Electrocardiogram.

Unit-4

Excretion Structure of urinoferous tubule mechanism of urine formation, Nervous system: - conduction of nerve impulse, reflex action. Endocrinology :Structure and function of major endocrine glands – (Pituitary gland, thyroid gland, parathyroid gland, adrenal gland, pancreas, etc.)

Reference Books:

1. Human physiology– Chatterjee A.G. vol.-I&II.
2. Parameswaran, Anantakrishnan and Ananta subramanyam, 1975, outline of Animal physiology. 3-Tortora G.J. & Grabowski, S (2006).
3. Hall, J. E., Guyton and Hall Text Book of Medical Physiology, 12th edition, SaundersCompany (2010).

PRACTICAL SYLLABUS

Title: CELL BIOLOGY AND GENETICS LAB

Course Code– AUBSEV.3BP

LIST OFEXPERIMENTS:

Experiments to be performed by candidates:

1- Testforamylaseonstarch.
2- Preparationof haemincrystals.
3- DeterminationofHb%inbloodsample.
4- RBC countbyhaemocytometerinblood.
5- Testforsugar, proteinsandlipids.

Experiments for demonstration and comments:

1. Osmosis
2. Muscletwitchbystimulatingitwithmechanical, chemicaland thermalstimuli.
3. Reflexaction
4. Respiration
5. Recordingofbloodpressureusingasphygmomanometer

Prepared slides:

Study of Histological slidesof mammals–

1. T.S.salivarygland, T.S.pancreas, T.S.liver, T.S.Intesting.
6. T.S.kidney, T.S.lungs, T.S.stomach
7. Pituitary, gland, thyroid gland
8. Medulatedandnonmedulatednervefibre5-Smooth& striated muscle

Evaluation Scheme of Practical Examination:

Internal Evaluation (20 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 4-point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

PRACTICAL PER FORMANCE &VIVA DURING THE SEMESTER (20 MARKS)				TOTAL
EXPERIMENT (05 MARKS)	FILE WORK (05MARKS)	ATTENDANCE (05MARKS)	VIVA (05MARKS)	INTERNAL (20

External Evaluation (30 Marks)

The external evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

Experiment	File work	Viva	Total
(10 MARKS)	(10 MARKS)	(10 MARKS)	(30 MARKS)

PROFESSIONAL EDUCATION-10(PE-10)

Title: CONTEMPORARY INDIA AND EDUCATION

Course Code– AUBSEVI.4

Credits: 04 (3L+1T+0P) **Max. Marks: 100**
Contact hours per week: 04 **Internal: 40**
Exam duration: 3:00 Hrs **End Term Exam: 60**

Course objectives:

The student-teachers will be able to:

1. Understand the Constitutional Provisions for Education in India.
2. Understand the Fundamental Rights, Duties and Directive Principles of the State Policy.
3. Develop competencies to understand the various issues related to Educationand remedial measures.
4. Understand the Constitutional provisions for inequality, discrimination and marginalization in UEE.
5. Understand the importance of Education for the marginalized groups
6. Acquaint with the policy initiatives, educational policies and programme in Contemporary India.

Unit -1 Education and the Indian Constitution.

- Indian Constitution: Preamble, Rights and Duties, Directive Principles of the State Policy and Aims of Education as per Constitutional Values; Constitutional Provisions for Education: Article 14, 15, 21A, 45, 46 and 51A (K).

Unit-2 Inequality, Discrimination and Marginalization in Universalization of Education.

- Equality of Educational Opportunities: Meaning, Objectives and Scope.
- Discrimination: Meaning, Factors and Constitutional Safeguards.
- Right to Education: Historical Development, Provisions, issues and Challenges in implementation.
- Education of the Marginalized Groups (Women and Socially Disadvantaged): Status, Issues and Constitutional Provisions.

Unit-3 Policy Initiatives for Universalization of Elementary Education.

- Kothari Commission (1964-66) and NPE (1986 -1992) and Recommendations for UEE.
- Operation Blackboard: Concept and Provision.
- DPEP and SSA: Objectives, Provisions, Implementation and Evaluation.
- MDM: Objectives, Implementation and Problems.

Unit :4 Emerging Concerns and Education

- Education for Environmental Conservation: Global Environmental Crises, Local Environmental Issues, Steps for Environmental Conservation and Regeneration.
- Liberalization, Globalization and Privatization and their Impact on Indian Education.
- Social Basis of Education in the Context of Society, Culture and Modernity.

Activities (Any One of the following)

1. Presentation on various National Educational Policies.
2. Preparation of reports on the State and Centrally Sponsored Schemes of Education like SSA, RMSA, MDM.
3. Conduct surveys on Educational problems at school level.

REFERENCES:

1. Aggarwal J.C.(1984). Implementation of the Major Recommendations of the Education Commission 1964-66 and The New Pattern of Education India: New Delhi: Arya Book Depot.
2. BhakshiP.M., (1998). The Constitution of India, New Delhi: Universal Law PublishingCompany.
3. Bakshi, P.M. Basu, (2010). Constitution of India (2nd ed.) Delhi: Universal Law Publishing Co.

4. The Constitution of India Bare Act (2010). Delhi: Universal law Publishing Co.
5. Govt. of India (1986). National Policy of Education, MHRD, New Delhi. Govt. of India (1992). Programme of Action (NPE). MHRD, New Delhi.
6. NCERT (1986). School Education in India. Present Status and Future Needs, New Delhi: NCERT Publication. Jan Bostock, Barry K. Gills (2013). The Globalization of Environmental Crisis. New York:Routledge, Publication.

PROFESSIONAL EDUCATION-11 (PE-11)

Title: TEACHING OF PHYSICAL SCIENCES-1
Course Code– AUBSEVI.5A

Credits: 02 (1L+1T+0P) | **Max. Marks: 50**
Contact hours per week: 02 | **Internal: 20**
Exam duration: 1:30 Hrs | **End Term Exam: 30**

Course objective:

The student teachers will be able to:

1. Familiarize with nature of physical science.
2. Formulate instructional objectives in behavioral terms.
3. Apply various approaches and methods of teaching physical science.
4. Select and integrate various kinds of instructional media.

UNIT-I: Foundations of Physical Science

-Meaning, Nature and Scope of Physical Science.
-Aim and Objectives of Teaching Physical science; Taxonomy of Educational objectives; Writing Instructional objectives in behavioral terms.
-Importance of Physical Sciences as a Subject of the School Curriculum.
-Brief life history of Eminent Indian Scientists and their contributions-C.V. Raman, J.C. Bose, Satyendranath Bose, Vikram sarabhai, Homi Jahangir Bhabha, A.P.J. Abdul Kalam.

UNIT-II : Curriculum, Methods and Approaches of Teaching Physical Sciences.

-Curriculum in Physical Science: Meaning, Objectives, Principles and steps of Curriculum construction.
- Process of Evaluation of Physical Science Curriculum at School Level.
-Methods of teaching Physical Science with Reference to lecture, Lecture-Cum-Demonstration, Project Method, Problem Solving Approach, Laboratory, Heuristic and Inductive-Deductive Approach, CAI.
-Activity Approaches and Non-Formal Methods of teaching Physical Science in terms of Field trips, Sciences Club, Science, Museum, Science Fairs.

Activity (Any one of the following)

1. Preparation of low cost and no cost teaching aids and studying their effectiveness a classroom transaction.
2. Developing a unit plan of own choice.
3. Prepare a report on critical analysis of physical sciences curriculum prescribed by HPBSE/CBSE for secondary school stage.

Suggested Readings:

Das, R.C. (1989): Science Teaching in Schools, New Delhi: Sterling Publishers:
Kumar, Amit (2002): Teaching of Physical Science, New Delhi: Anmol Publications,.
Mangal, S.K.(1997): Teaching of Science, New Delhi: Arya Book Depot.
Mohan, Radha (2002): Innovative Physical Science Teaching Methods. New Delhi: P.H.I.

Sharma, R.C.(1998): Modern Science of Teaching, New Delhi: Dhanpat Rai and Sons,.
Vaidya, Narendera (1996): Science of teaching for 21st Century, New Delhi: Deep and Deep Publishers.

PROFESSIONAL EDUCATION-12 (PE-12)

Title: TEACHING OF LIFE SCIENCES-1
Course Code– AUBSEVI.6A

Credits: 02 (1L+1T+0P) **Max. Marks: 50**
Contact hours per week: 02 **Internal: 20**
Exam duration: 1:30 Hrs **End Term Exam: 30**

Course objective:

The student teachers will be able to:

1. Understand various objectives of teaching life sciences and to write the same in behavioral terms.
2. Understand and apply various methods of teaching life sciences.
3. Understand, analyze and improve present curriculum of life sciences operative at school level.

4. Understand the importance and appropriate use of different audio visual aids and improvised apparatus in Indian conditions with reference to concepts to be taught.

Unit 1. Foundations of Teaching of Life Science.

- Meaning, nature and scope of Life Science, Historical development of Life Sciences in secondary school curriculum.
- Aims and Objectives of Teaching Life Sciences at secondary stage; Writing instructional Objectives in behavioral terms. Formulation and classification of Instructional Objectives for teaching of Life Sciences with reference to cognitive, affective and psychomotor domains.
- Life Science Curriculum at School stage; concept, scope and principles of curriculum construction, approaches of curriculum construction such as concentric approach, topical approach and unit approach.
- Process of Evaluation of Life Science Curriculum at School level (HPBSE and CBSE).

Unit2: Teaching Methods, Approaches and Techniques.

- Teaching methods in Life Science: lecture method, lecture-cum demonstration method, project method, heuristic method, laboratory method.
- Approaches in Life Science: Inductive-deductive approach, problem solving approach, computer assisted instructions and web based instructions.
- Visualizing, organizing and contextualizing learning situations through:
  a. Field Trips.
  b. Biological Associations, Science Fairs and Exhibitions.
  c. Botanical Garden.
  d. Museum.
  e. Aquarium and Vivarium.
  f. Biology Clubs.
  g. Science Excursions.
  h. Concept Mapping.
- Facilitating Life Science Learning: issues in practice; collective learning, peer learning; dealing students in heterogeneous classes.

Activity (Any one of the Following)

The students teacher will perform the following experiments and record them in the practical journal/ file.

1. To prepare a temporary mount of a leaf peel to show stomata.
2. To show experimentally that carbon dioxide is given out during respiration.

Prepare a report on critical analysis of life sciences curriculum prescribed by HPBSE/CBSE for secondary school stage.

Suggested Readings:

Bhandula, N. Chandha, Sharma, P.C. (1989): Teaching of Science, Ludhiana: Prakash Brothers.

Gupta V. K. (1994): Life Science Education Today. Chandigarh: Arun Publishing House. Kohli, V. K. (2006): How to Teaching Science. Ambala: Vivek Publishers,.

Sood, J. K. (1987): Teaching of life Science. A Book of methods. Chandigarh: Kohli Publishers.

Venkataish, S. (2002); Science Education in 21st century, New Delhi: Anmol Publications.

Yadav, K.: Teaching of Life Science, New Delhi: Anmol Publications.

Manal S. K. (2005): Teaching of Life Science India: Arya Publication,. Sharma, P. (2007): Teaching of Life Science, New Delhi: APH Publishing Corporation.

PROFESSIONAL EDUCATION SCHOOL INTERNSHIP-1 (PESI-1)

Title: SCHOOL INTERNSHIP-1
(Preliminary School Engagement)
Course Code– AUBSEVI.7

Credits: NIL **Grading: Four Point**
Duration: 04 Weeks **Evaluation: Internal**

Objectives:

- To familiarize the student teachers to school environment, its structure, functions and processes.
- To provide field experience of assessment practices including record maintenance and report cards followed in schools at elementary and secondary levels.
- To familiarize student teachers with classroom processes and skills employed in teaching-learning process.
- To familiarize the student teachers with different types of schools existing in the community.
- Understand learners coming from diverse backgrounds.
- Analyze the availability of physical and learning facilities which function as the curriculum resources at secondary level.
- Analyze the relevance of principles of curriculum organization and transaction to actual implementation process of curriculum in schools.

Course Content:

The school internship shall be of one month (4 weeks) duration during this semester of the course. These four weeks shall include an initial phase of one week meant for orientation of student-teachers about the school, its management structure, functioning and organization of co-curricular activities. The second 10 week of practice teaching will include study of maintenance of various school records (eg. CCE records, admission-withdrawal registers, attendance records, stock registers etc.). The student-teachers will prepare separate reports on school management, its functioning and maintenance of different records by both the school authorities. The third and fourth weeks will include observation of senior teachers of the school by the student teachers. The candidates will prepare twenty observation lessons (10 in each teaching subject) and get them verified from the concerned senior teacher. Feedback will be provided to the candidates on his/her performance by the school teachers and teacher educator of the institution concerned in which the student is studying.

The student-teachers will prepare and submit following reports / lessons which will be graded by the concerned teacher educator / institution on a four points letter grading scale i.e. A, B, C and D (excellent, very good, good and satisfactory).

1. Report on school organization and management structure.
2. Report on Maintenance of various school records.
3. 20 Observation Lessons (10 per teaching Subject) of School Teachers.

Evaluation: All assessments are internal

SEVENTH SEMESTER

GENERIC ELECTIVE-2A (GE-2A)
INDIAN CONSTITUTION AND HUMAN RIGHTS

Title: INDIAN CONSTITUTION AND HUMAN RIGHTS-1
Course Code: AUBSEVII.1

Credits: 02 (2L+0T+0P) | **Max. Marks: 50**
Contact hours per week: 02 | **Internal: 20**
Exam duration: 1:50 Hrs | **End Term Exam: 30**

Objectives:

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

i. know the importance, preamble and salient features of Indian Constitution.
ii. appreciate the significance of Fundamental Rights, Duties and Directive Principles of State Policy.

Transaction Mode: Through Lectures, Group discussions, Interactive sessions, field activities and use of Education Technology.

Course Content:

Unit I: Meaning and Importance of the Constitution:

Preamble, Salient features, Constituent Assembly and the Spirit of the Indian Constitution.

Unit II: Fundamental Rights, Duties and Directive Principles:

Fundamental Rights, Fundamental Duties, and the Directive Principles of the state policy of the Indian Constitution.

References:

1. Pylee, M. V, Indian Constitution, OUP, New Delhi.
2. Granveille Austin, Indian Constitution, OUP, New Delhi.
3. Rajani Kotari, Politics in India, OUP, New Delhi.
4. Johari, J C, Indian Government and Politics.
5. Maheswari, S. R, Local Governments in India (Latest Edition).
6. Arora, R.K, and Rajani Goyal, Indian Public Aministration 1995.
7. Bhambri, C. P, Introduction to Indian Constitution.
8. Subash C Kashyap, The Working of Indian Constitution, NBT, New Delhi.
9. Subash C Kashyap, Our Parliament, NBT, New Delhi.
10. Granveille Austin, Functioning of the Indian Constitution, NBT, New Delhi.
11. Bipan Chandra, India after Independence, Roopa, New Delhi. 2000.
12. Arjun Dev, Source Book on Human Rights, NCERT, New Delhi.
13. Human Rights in India: Theory and Practice, National Book Trust, 2001.

PROFESSIONAL EDUCATION-13 (PE-13)

Title: TEACHING OF PHYSICAL SCIENCES-2
Course Code– AUBSEVII.2A

Credits: 02 (1L+1T+0P) **Max. Marks: 50**
Contact hours per week: 02 **Internal: 20**
Exam duration: 1:30 Hrs **End Term Exam: 30**

Course objectives:

The student teachers will be able to:

1. Select and integrate various kinds of instructional media.
2. Organize various co-curricular activities.
3. Select appropriate text books.
4. Explain the concept of evaluation.
5. Plan lessons in physical science.

UNIT-I: Learning Resources in Physical Sciences.

-Text Books- Meaning, Types, Importance, Uses and Evaluation of Text Books.

-Laboratory Materials-Importance, Planning, Designing and Maintenance of Different type of Laboratory Materials, Common Accidents and their prevention in Science Laboratories.

-Journals, Handbooks, Student's Works Books, Display-Slides, Audio-Visual Support Material, Smart Classrooms, e- learning Resourses.

-Teaching Aids: Classification of Teaching Aids and Their Description. Importance of Teaching Aids in Teaching Physical Science: Preparation and Development of Low Cost Improvised Apparatus.

UNIT-II: Planning for Teaching, Assessment and Evaluation.

-Unit and Lesson Planning: Need, Advantages, Steps, Various Approaches and Strategies of Lesson Planning.

-Meaning and Difference between Assessment and Evaluation; Evaluation in Physical Sciences-Importance and Types of Evaluation viz. Formative and Summative.

-Common Difficulties in learning Physical Science and Remedial measures-procedures in preparation of Criterion Reference and Norm Referenced Tests.

-Evaluting Outcomes of Science Teaching; Preparing Different Type of Test Items and Their Advantage and Limitations; Diagnostic Testing and Remedial Teaching.

Activity (Any one of the following)
-Seminar on contribution of eminent Indian Scientists to science and their implication in science advancement.
-Developing an action plan for organization of a science exhibition, framing guideline on a selected theme and various sub-themes.

Suggested Readings:

Das, R.C. (1989): Science Teaching in Schools, New Delhi: Sterling Publishers. Kohli, V.K. (1998): How to Teach Science, Ambala: Vivek Publishers,.

Kumar, Amit (2002): Teaching of Physical Sciences, New Delhi: Anmol Publications,.

Mangal, S.K. (1997): Teaching of Science, New Delhi: Artya Book Depot.

Mohan, Radha (2002): Innovative Physical Science Teaching Methods. New Delhi: Sharma, R.C. (1998): Modern Science of Teaching, New Delhi: Dhanpat Rai and Sons,.

Kulshreshtha, R.P. (2010): Teaching Physical Science. Meerut: R. Lall.

PROFESSIONAL EDUCATION-14 (PE-14)

Title: TEACHING OF LIFE SCIENCES-2
Course Code– AUBSEVII.3A

Credits: 02 (1L+1T+0P) **Max. Marks: 50**
Contact hours per week: 02 **Internal: 20**
Exam duration: 1:30 Hrs **End Term Exam: 30**

Course objectives:

The student-teachers will be able to:

1. Relate the knowledge of life sciences with other subjects of school curriculum.
2. Develop basic teaching skills for improvement of teaching-learning process.
3. Get familiar with principles and materials for setting an ideal life science laboratory.
4. Understand the present techniques of evaluation in life sciences.

Unit 1. Learning Resources in Life Science.

- Learning Resources: Meaning, types, functions, preoaration and utilization of learning resources in Life Sciences; Models, Blackboards, Charts, Television, Computer, Educational CD's and use of Smart Classrooms; Effective use of Life Science Text Book as a learning resource.
- Life Science teacher: qualities and professional growth.
- Organization of Life Science Laboratory: layout of laboratory, Procuring and Maintenance of equipments for Life Science Laboratory and use of Laboratory for practical work and teaching of Life Sciences. Accident prevention and first aid requirements in Life Science Laboratory.
- Developing Teaching Skills as a base for effective teaching with special reference to Blackboard writing, demonstration, expiation, illustrating with examples, probing question, stimulus variation and reinforcement.

Unit2: Planning for Teaching of Life Sciences and Evaluation techniques

- Importance of Planning for Teaching; Unit Planning and Lesson Planning: Meaning, need, advantages, stages and various approaches of lesson planning.
- Evaluation in Life Sciences: purpose of evaluation, types of evaluation, different evaluation techniques with special reference to continuous and comprehensive evaluation (CCE) technique.
- Achievement Test in Life Science: Meaning, types of Achievement Test (Norm Referenced and Criterion referenced test); various steps involved in the construction and standardization of Achievement test, types of test items, short answer type and objective type.
- Assessment of Experiment work/Project work in Life Science

Activity (Any one of the Following)

The student-teacher will perform the following experiments and record them in the practical journal/ file;

1. To study (a) binary fission in Amoeba and (b) budding in Yeasts with the help of prepared slides.
2. To determine the percentage of water absorbed by resin.

Suggested Readings:

Bhandula, N. Chandha, Sharma, P.C. (1989): Teaching of Science, Ludhiana: Prakash Brothers.

Gupta V.K.(1994): Life Science Education Today. Chandigarh: Arun Publishing House. Kohli, V.K.(2006): How to Teaching Science. Ambala: Vivek Publishers,.

Sood, J.K.(1987): Teaching of life Science. A Book of methods. Chandigarh: Kohli Publishers.

Venkataish, S.(2002); Science Education in 21st century, New Delhi: Anmol Publications.

Yadav, K.: Teaching of Life Science, New Delhi: Anmol Publications.

Mangal S.K. (2005): Teaching of Life Science India: Arya Publication,. Sharma, P. (2007): Teaching of Life Science, New Delhi: APH Publishing Corporation.

PROFESSIONAL EDUCATION SCHOOL INTERNSHIP-2 & 3
(PESI-2&3)

Title: SCHOOL INTERNSHIP-2
(Teaching Practice)

Course Code– AUBSEVII.4 Skill in Teaching (School Subject-I)
AND
Course Code– AUBSEVII.5 Skill in Teaching (School Subject-II)

Credits: 12 (06+06)
Duration: 16 Weeks in a School

Max. Marks: 300 (150+150)
Evaluation: External 200 (100+100)
Internal 100 (50+50)

The School Internship in teaching practice in seventh semester of the Course will be of sixteen weeks duration. The student-teachers will prepare and submit following number of lessons which will be examined by the panel of external examiner to be appointed by the University.

1. **40 Macro Lessons in Each Teaching Subject (Total 80 Lessons).**
2. **20 Observation Lessons in Each Teaching Subject (Total 40 Lessons).**

The student-teachers will produce the file containing micro teaching lessons and simulated teaching lessons, reports of other activities carried out in the school and three handwritten copies of final lesson plans in each teaching subject at the time of final teaching practice examination. The two final lessons delivered by the student teachers along with above mentioned files and reports will be examined by the panel of examiners and due weightage will be given to these records while carrying out evaluation of the student-teachers. The lists of marks of students so evaluated shall be dispatched to the Controller of Examinations and/or Assistant Registrar, Evaluation Branch, Abhilashi University, Chailchowk Mandi (H.P.) immediately after the completion of teaching practice examination. Each of the examiners will be paid remuneration for all the students so evaluated by three examiners. During practice teaching, the student teachers are required to take part in morning assembly of the school, check the home task given to the students and maintain attendance registers of school students.

EIGHTH SEMESTER

GENERIC ELECTIVE-2B (GE-2B)
INDIAN CONSTITUTION AND HUMAN RIGHTS

Title: INDIAN CONSTITUTION AND HUMAN RIGHTS-2
Course Code: AUBSEVIII.1

Credits: 02 (2L+0T+0P) | **Max. Marks: 50**
Contact hours per week: 02 | **Internal: 20**
Exam duration: 1:50 Hrs | **End Term Exam: 30**

Objectives:

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

i. develop an understanding of the strength of the Union Government.
ii. understand the functioning of the State Government for the unity and the strength of the Democracy.
iii. know the importance of local self-Government and Panchayati Raj Institutions in India.
iv. know the meaning, significance, the growing advocacy of Human Rights.

Transaction Mode: Through Lectures, Group discussions, Interactive sessions, field activities and use of Education Technology.

Course Content:

Unit I: Union, State and Local Self Governments:

Union Government: Parliament, the President and Prime Minister: State Government: Governor and the Council of Minister: Judiciary: Functions and Powers: Panchayat Raj System.

Unit II: Human Rights:

Origin and Development of Human Rights, Growing Advocacy and Declining Trends of Human Rights, Rights of Scheduled Casts, Scheduled Tribes, Minorities, Children and Women, Human Rights Defenders, Human Rights Violation and Human Rights Organizations.

References:

1. Pylee, M. V, Indian Constitution, OUP, New Delhi.
2. Granveille Austin, Indian Constitution, OUP, New Delhi.
3. Rajani Kotari, Politics in India, OUP, New Delhi.
4. Johari, J C, Indian Government and Politics.
5. Maheswari, S. R, Local Governments in India (Latest Edition).
6. Arora, R.K, and Rajani Goyal, Indian Public Aministration 1995.
7. Bhambri, C. P, Introduction to Indian Constitution.
8. Subash C Kashyap, The Working of Indian Constitution, NBT, New Delhi.
9. Subash C Kashyap, Our Parliament, NBT, New Delhi.
10. Granveille Austin, Functioning of the Indian Constitution, NBT, New Delhi.
11. Bipan Chandra, India after Independence, Roopa, New Delhi. 2000.
12. Arjun Dev, Source Book on Human Rights, NCERT, New Delhi.
13. Human Rights in India: Theory and Practice, National Book Trust, 2001.

PROFESSIONAL EDUCATION-15 (PE-15)

Title: KNOWLEDGE AND CURRICULUM
Course Code– AUBSEVIII.2

Credits: 04 (3L+1T+0P) **Max. Marks: 100**
Contact hours per week: 04 **Internal: 40**
Exam duration: 3:00 Hrs **End Term Exam: 60**

Course Objectives:

At the end of this course, students will be able to:

1. Understand the meaning and principles of curriculum.
2. Understand and appreciate curriculum as a means of development of the individual
3. Understand the foundations and evaluation of curriculum,
4. Comprehend the different models of curriculum compare the view point given by different commissions
5. Develop an understanding of the concept, need, scope and functions of school management
6. Develop an understanding of different components of human and material resources of the school

Unit I Knowledge and Education

- Knowledge: Concept, Types and Sources of Knowledge. Distinction between Knowledge and Skill, Teaching and Training, Knowledge and Information, Reason and Belief.
- Bases of Modem Child-centered Education: Concept of Activity, Discovery and Dialogue with reference to Gandhi, Sri Aurobindo, Giju Bhai and Paulo Freire.
- Education in Relation to Modem Values: Equity, Equality, Individual Opportunity and Social Justice with reference to Indian Constitution.
- Concept of Nationalism, Universalization , Secularism and their relationship to Education.

Unit II Basis and Principles of Curriculum

- Curriculum: Meaning, Nature, Need and Characteristics.
- Curriculum Development: Stages and Principles of a Curriculum.
- Bases of Curriculum: Philosophical, Psychological and Sociological.
- Approaches to Curriculum Development Subject-centred Learner-centred and Problem-centred.
-

Unit III Model, Patterns and Approaches of Curriculum Designing

- Models of Curriculum Designing: Administrative Line Staff (Taxler), Grassroot-level Planning (Hilda Taba).
- Models of Curriculum Designing: Tyler's Model and Wheel's Model.
- Approaches of Curriculum Development: Concept, Advantages and Limitations of Centralized and Decentralized Curriculum Designing.

Unit IV Curriculum Evaluation

- Evaluation of Curriculum: Need, Importance and Procedure of Curriculum Evaluation.
- Recommendations of Various Commissions: University Education Commission (1948), Secondary Education Commission (1952-53), Education Commission (1964-66) and NPE (1986-1992) with regard to curriculum development.
- NCF (2005) and its recommendations with regard to curriculum evaluation.

Activities (Any one of the following):

1. Evaluation of textbook of secondary level class and prepare a report.
2. Prepare a curriculum of any subject using Hilda Taba approach.

Suggested Readings

1. Aggarwal, Deepak (2007) Curriculum Development Concept Methods and Techniques. New Delhi Book Endave.

2. Aggarwal, J.C. (1967). Education Administration, School Organization and Supervision Delhi: Arya Book
3. Aggarwal, J. C. (2003). Handbook of Curriculum and Instruction, Delhi Doaba Book House
4. Arora, G.L (1984) Reflections on Curriculum. NCERT.
5. Bhatia, K. K & Chadda D. P. C. (1980). Modern Indian Education and its Problems Ludhiana: Prakash Brothers
6. Chopra, RK (1993). Status of Teacher in India, New Delhi: NCERT

PROFESSIONAL EDUCATION-16 (PE-16)

Title: UNDERSTANDING THE SELF
Course Code– AUBSEVIII.3

Credits: 02 (1L+1T+0P) **Max. Marks: 50**
Contact hours per week: 02 **Internal: 20**
Exam duration: 1:30 Hrs **End Term Exam: 30**

Course objectives:
At the end of this course, students will be able to:

1. understand self-concept and its importance in human life
2. understand self-confidence and its importance in human life
3. understand the nature, classification, sources, and methods of inculcation of human values
4. understand the role of different agencies in promotion of human values
5. define philosophy of yoga
6. explain the psychological and physiological basis of yoga

Unit 1 The Self and Human Values

- Meaning, Nature and Importance of Self-concept and Self-Confidence in Human Life.
- Human Values: Meaning, Nature, Importance, Sources and Methods of Inculcation of human values.
- Classification of Values.
- Role of Family, Educational Institutions, Community and NGO's in Promotion of Human Values.

UNIT 2: Philosophy and Psychology of Yoga

- Yoga: meaning, nature and importance.
- Concepts of the Prakriti and Purusha (ishwar): Concept and their relation with each other in Sankhya philosophy.
- Ashtanga Yoga of Patanjali.
- Therapeutic Values of Yoga, Yogic Diet & its Impact on Health, Asanas and their effects to promote a sound physical and mental health.

Activity (Any one of the Following)

1. Preparation of Scrap Book on any six major Yoga /Asanas with their benefits.
2. Select a story/ an episode / an incident from an epic or any situation and analyse the human values integrated in it.
3. Preparation of scrap book on any five human Values.

Suggested Readings:

1. Goel, A and Goel, S.L. (2005), Human Values and Education Deep and Deep Publications Pt. Ltd. New Delhi
2. Gokak, V.K. (1973). A Value Orientation to our System of Education, New Delhi: M.M. Gulb and Sons
3. Gore. M.W. (2005) Anatomy and Physiology of Yogic Practices, Kaivalyadhama, Lonavla
4. Gayal, B.R. (1979), Document on Social, Moral and Spiritual Values in Education. New Delhi:NCERT
5. Joshi, Kireet (1976). Education for Personality Development, New Delhi: NCERT, (NIE Lecture Series)
6. Katoch S.K. (2013) Manviya Mulya, Paryavaran Aur Manvadhikar Shiksha", Chandigarh Mohindra Capital Publishers (P) Ltd.
7. NCERT. (2000), Education for Values Development, Chapter 5, In National Curriculum Framework for School Education, New Delhi.

PROFESSIONAL EDUCATION-17 (PE-17)

Title: GENDER, SCHOOL AND SOCIETY
Course Code– AUBSEVIII.4

Credits: 02 (1L+1T+0P) **Max. Marks: 50**
Contact hours per week: 02 **Internal: 20**
Exam duration: 1:30 Hrs **End Term Exam: 30**

Course Objectives:
The student-teachers will be able to:

1. Develop basic understanding and familiarity with key concepts: Gender bias, gender stereotype, empowerment, equity and equality, patriarchy, matriarchy, masculinity and feminism.
2. Understand some important landmarks in connection with gender and education in the historical and contemporary perspective.
3. Learn about gender issues in school curriculum, textual materials across discipline, pedagogical processes and its interaction with class, caste, religion and region.

Unit-1 Gender Issues and Gender Studies

- Concept of Gender: Meaning of gender equality, need and importance, Gender bias, Gender stereotypes.
- Gender equity and equality in India in relation to caste, class, religion, ethnicity, disability and region.
- Historical backdrop: Some landmarks from social reform movements of the 19th and 20th centuries with focus on women education.
- Policy Initiatives for Gender equality and women empowerment in India.

Unit –2 Gender, Education and Empowerment

- Socialization theory of gender and educational implications.
- Gender identities and socialization practices in: family, school, other formal and informal organizations.
- Schooling of girls: Inequalities and resistances, issues of access, retention and exclusion (infrastructure and hidden curriculum).
- Role of education in dealing with social Issues: Domestic violence against women, female foeticide and infanticide and dowry.

Activity:
1. Development of a project on the organizational climate of two schools' single sex and co-educational school.

References:

1. Aaker's. (1994) Feminist Theory and The Study of Gender and Education In S. Acker, Gendered Education: Sociological Reflections on Women. Teaching and Feminism, Buckigham Open University Press.
2. Bars, O. (1971) Sociology of Education Ed. 2 London: Batsford.
3. Shokeshaft, Charol (1989), Women in Education Administration, New Bury Park:Sage Publication.
4. Devendra, K (1994). Changing Status of Woman in India, New Delhi: Vikas Publishing House.
5. Gupta, AK. (1986). Women and Society. New Delhi: Sterling Publication.
6. Mangal, S.K. & Uma Mangal (2009). Essentials of Educational Technology. New Delhi PHI Learning P. Ltd.

PROFESSIONAL EDUCATION-18 (PE-18)

Title: DRAMA AND ART IN EDUCATION
Course Code– AUBSEVIII.5

Credits: 02 (1L+1T+0P)	**Max. Marks: 50**
Contact hours per week: 02	**Internal: 20**
Exam duration: 1:30 Hrs	**End Term Exam: 30**

Course objectives:
The student teachers will be able to:

1. Understand the concept and importance of various arts in human life.
2. Understand aims, objectives and principles of performing and visual arts.
3. Appreciate Indian folk and visual and performing arts.
4. Understand various methods and techniques of teaching creative arts.
5. Understand the importance of visits in arts exhibitions and cultural festivals.

UNIT-I Origin and Development of Art in India.

- Meaning of Art: Concept and Scope of Art.
- Origin & development of Arts in India with special reference to the performing and visual arts.
- Importance of various Arts in Life and Education.
- Aims and objective of teaching performing and visual arts, Principles of Art.

UNIT-II Methods and Approaches of Teaching Creative Arts

- Understanding Indian folk and visual and performing arts.
- Methods of teaching creative arts: a. Lecture cum Demonstration method, b. Direct Observation method. c. Method of Imagination and Free Expression.
- Importance of visits in art exhibitions and cultural festivals.
- Process of preparing canvas, Types of Colours and Paints.

Activity (Any one of the following):
Practical work to be submitted by students during the session: Size- Imperial Size Sheet. One Canvas in size 18'X 22' to be submitted along with the sheets.

1. Landscapes –1
2. Still life – 1
3. Poster-1

Suggested Readings:

1. Brown, Percy (1953). Indian Painting, Calcutta.
2. Chawla, S.S. (1986). Teaching of Art. Patiala: Publication Bureau, Punjabi University.
3. Harriet, Goldstein (1964). Art in Everyday Life. Calcutta: Oxford and IBH Publishing Company
4. Jaswani, K.K., Teaching and Appreciation of Art in Schools. Lowenfeld Viktor.
5. Creative and Mental Growth. Margaret, Marie Deneck (1976)
6. Indian Art. London: The Himalaya Publication.
7. Sharma, L.C., History of Art, Meerut: Goel Publishing House.
8. Read.Herbert. Education through Art [paperback).
9. Shelar, Sanjay. Still Life. Jyotsna Prakashan.

PROFESSIONAL EDUCATION-19 (PE-19)

Title: HEALTH AND PHYSICAL EDUCATION
Course Code– AUBSEVIII.6

Credits: 02 (1L+1T+0P)	**Max. Marks: 50**
Contact hours per week: 02	**Internal: 20**
Exam duration: 1:30 Hrs	**End Term Exam: 30**

Course objectives:
The student-teachers will be able to

1. Understand concept of health, hygiene and health education.
2. Differentiate between communicable and non-communicable diseases.
3. Develop skills in marking grounds for different games.
4. Understand the objectives of school health services,
5. Understand the concept and importance of physical education.

Unit-1 Health Education

- Definition of Health, Health Education, Health Instruction, Health Supervision; Aim, objectives and Principles of Health Education.
- Health Services and guidance instruction in personal hygiene.
- Communicable and Non-Communicable Diseases; Obesity, Malnutrition, Adulteration in food, Environmental sanitation; Personal and Environmental Hygiene for schools.
- Objective of school health services, Role of health education in schools, Health Services- Care of skin, Nails, Eye health service, Nutritional service, Health appraisal, Health record, Healthy school environment, first-aid and emergency care.

Unit-2 Physical Education

- Meaning, Definition and Scope of Physical Education, Importance of Physical Education in present era, Misconception about Physical Education
- Aims and objectives of Physical Education
- Importance of Tournament, Types of Tournament and its organization: structure- knock-out Tournaments, league of Round Robin Tournaments, Combinations Tournament and challenge Tournament.
- Organization structure of Athletic Meet.

Activity (Any one of the following):

Mark a Sports ground and Prepare a report mentioning dimensions, rules, regulations and specification of any one of the following games: Volleyball/ Kabaddi/Kho-Kho / Wrestling /Badminton /Table Tennis/ Basketball/ Hockey.

References:

1. Agrawal, K.C. (2001). Environmental Biology Bikaner: Nidhi publishers Ltd
2. Frank, H. & Walter, H. (1976). Tumers School Health Education. Saint Louis: The C.V.Mosby Company
3. Nemir, A (n.d.). The School Health Education. New York: Harber and Brothers. Odum, EP. (1971). Fundamental of Ecology. USA:W.B.
4. Saunders Co Broyles, F.J. & Rober, H.D. (1979). Administration of Sports, Athletic Programme: A Managerial Approach. New York Prentice Hall Inc.