**M.Sc. ZOOLOGY**

*UNDER CBCS*

*(With effect from 2014 – 15 onwards)*

The Course of Study and the Scheme of Examinations

<table>
<thead>
<tr>
<th>Year / Semester</th>
<th>Subject Core/elective/paper code</th>
<th>Paper</th>
<th>Title of the Paper</th>
<th>Credit</th>
<th>Exam hrs</th>
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<tr>
<td>I Semester</td>
<td>Core PDZO 11</td>
<td>Paper I</td>
<td>Comparative and functional anatomy of Invertebrates</td>
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<td>Core PDZO 13</td>
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<td>Molecular Cell Biology</td>
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<td>Comparative and functional anatomy of invertebrates, and Chordates</td>
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<td>Elective – I PDZO 14</td>
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<td>Fishery science &amp; aquaculture (Elective I)</td>
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<td>Elective – II PDZO 15</td>
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<td>Medical Lab Technology (Elective II)</td>
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<td>Paper IV</td>
<td>Genetics and Biostatistics</td>
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<td>Paper V</td>
<td>Environmental Biology and Evolution</td>
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<td>Comparative animal Physiology</td>
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<td>Molecular Cell Biology, Genetics and Biostatistics</td>
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<td>Basic Concepts in Biotechnology (Elective IV)</td>
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List of Elective papers

1. Basic concepts in Biotechnology
2. Basic concept in Bioinformatics
3. Stem cell Biology
4. Nano - Biotechnology
5. Fishery Science and Aquaculture
6. Entomology
7. Medical lab technology
8. Ethnopharmacology
9. Reproductive Physiology and Endocrinology
CORE PAPER: I

COMPARATIVE AND FUNCTIONAL ANATOMY OF INVERTEBRATES

OBJECTIVES
To enlighten the students with adequate scientific details on origin, functional anatomy, mode of life and adaptive radiations with the relationships of invertebrates

UNIT I

UNIT II
Nutrition and Digestion,- Patterns of Feeding and digestion in lower metazoa, Mollusca, - Echinodermata, Filter feeding in polychaeta. - Respiration - Organs of respiration : Gills, lungs and trachea. - Respiratory pigments. - Mechanism of respiration.

UNIT III
Excretion in lower invertebrates, Excretion in higher invertebrates. Mechanism of Osmoregulation.

UNIT IV
Nervous System - Primitive Nervous systems:-Coelentrata and Echinodermata. Advanced nervous system: - Annelida, Arthropoda (Crustacea and Insecta) and Mollusca (Cephalopoda)

UNIT V
Reproductive system- alteration of generation in Coelenterata - sexual reproduction in Turbellaria- Arachnida - Asteroidea
REFERENCES

CORE PAPER: II

COMPARATIVE AND FUNCTIONAL ANATOMY OF CHORDATES

OBJECTIVES
To comprehend the systematic position, functional anatomy, mode of life, adaptive radiation of chordates.

UNIT I: PHYLOGENY
Sailent features of Prochordates,-Amphioxus- Ascidian-Balanoglossus.

UNIT II: STRUCTURAL
Peculiarities- Elasmobranch & Bony fish-External characters, Digestive, Respiratory, Circulatory, Nervous System, Sense Organs, Nervous system, Sense organs & Reproductive systems.

UNIT III: ADAPTIVE RADIATION OF CHORDATES
Adaptive radiation of fishes, Amphibians, reptiles, birds and mammals. Structural peculiarities of Prototheria, Metatheria and Eutheria.

UNIT IV: PARENTAL CARE & MIGRATION

UNIT V: COMPARATIVE ANATOMY
Comparative anatomy of Paired fins, limbs, heart, kidney, aortic arches and brain of vertebrates.

REFERENCES
CORE PAPER III: MOLECULAR CELL BIOLOGY

OBJECTIVES
To understand the structure and molecular basis of cellular interactions, energy transformation, regulation and control of genes, cell cycle and information transfer.

UNIT I: ULTRA STRUCTURE OF CELL
Prokaryotic Cell, Eukaryotic Cell, Structure, Comparison, Plasma membrane – Structure – Passive and active transport - Cellular communication

UNIT II: STRUCTURE AND FUNCTIONS OF CELL ORGANELLES
Ultra structure and function of Endoplasmic reticulum, Ribosome, Golgi bodies, Mitochondria, Lysosome. Nucleo cytoplasmic interactions, nuclear receptors

UNIT III: MOLECULAR STRUCTURE OF DNA
DNA – Chemical composition -Watson Crick model of DNA, Types of DNA, DNA Replication, types, enzymology and mechanism of semi conservative mode of replication – DNA damage and repair.

UNIT IV: MOLECULAR STRUCTURE OF RNA
RNA-Chemical composition-Types-Transcription-Enzyme-Synthesis of RNA-RNA polymerase structure, Basic features of RNA synthesis –Template recognition –Core promoters (-10 and 35 box), UP element, Initiation, elongation and termination.

UNIT V: SYNTHESIS OF PROTEIN
Mechanism of protein synthesis, components of protein synthesis-Transcription, Translation, Post translation modification.
REFERENCE/BOOKS


LAB COURSE – I

A. Comparative and functional anatomy of Invertebrates

1. Identification of selected protozoans, Helminthes, Larval forms of major phyla of invertebrates and their medicinal importance.

2. Dissection of digestive system, nervous system of insect and crustacean.

3. Identification and study of invertebrate fossils.

4. Mounting:
   a) Appendages of prawn
   b) Sting apparatus of honey bee.
   c) Mouth parts of House fly & Mosquito - structure and function.

B. Comparative and functional anatomy of chordates

1. Study of the following with reference to their adaptive features.
   1. Balanoglossus
   2. Amphioxus
   3. Ascidian
   4. Petromyzon
   5. Echeneis
   6. Hyla
   7. Draco
   8. Pigeon
   9. Bat
   10. Chameleon

2. Dissect and display the weberian ossicle in cat fish.

3. Aortic arches in teleost fish.

4. IX and X the cranial nerve of shark.
CORE PAPER :IV

GENETICS AND BIOSTATISTICS

OBJECTIVES
To understand the basic concept of genetic, Material, Mendelians rule, sex determination in human beings, and the mechanism of multiple in skin colour formation. To know the various genetic disorders and understand about the statistical population, variables, primary, secondary data, different kind of data presentation in the form of diagrams and various types of statistical applications.

UNIT I Microbial Genetics
Conjugation, Transformation, transclution and sexduction. Chromosome mapping in prokaryotes (Virus & Bacteria) and eukaryotes (Drosophila and man).

UNIT-II Enzyme regulation of gene action

UNIT-III
Human genetics- karyotype and nomenclature of metaphase chromosome bands; chromosome anomalies and diseases- chromosomal anomalies in malignancy (chronic myeloid leukemia, Burkitt’s lymphoma, retinoblastoma and Wilms’ tumor); genetic analysis of complex traits - complex pattern of inheritance, quantitative traits, threshold traits; human genome and mapping.

UNIT -IV
Population, Sample, variable, parameter, primary and secondary data, screening and representation of data. Frequency distribution, tabulation, bar diagram, histograms, per diagram, and cumulative frequency curves. Mean median, mode, quartiles and percentiles, measures of dispersion : range, variance,
standard deviation, coefficient of variation, symmetry: measures of skewness and kurtosis

UNIT-V

Simple linear regression and correlations. Understand and interpret results from Analysis of Variance (ANOVA), a technique used to compare means amongst more than two independent populations’ flow charts and programming techniques in statistics with R Programming.

REFERENCES

CORE PAPER: V

ENVIRONMENTAL BIOLOGY AND EVOLUTION

OBJECTIVES
To generate up-to-date knowledge on environmental conservation and management through a comprehensive understanding of the components of ecosystem, biological cycles, habitat ecology, resource ecology, pollution and its management and To comprehend the scientific concepts of animal evolution through an understanding of its evidences, its mechanics, process and products.

UNIT-I: ECOSYSTEM AND COMMUNITY
Ecosystem and Community - Review of concept of ecosystem - Natural and Man-made ecosystem, with examples. Energy flow - Trophic structure and levels - Pyramids, food chain and web - ecological efficiencies, and productivity and its measurement.

UNIT-II: POPULATION AND BIOLOGICAL CYCLES

UNIT-III: RESOURCES ECOLOGY
Renewable and non - renewable resources - animal resources. Conventional and non - conventional energy sources.

UNIT-IV: ENVIRONMENTAL CONSERVATION, POLLUTION AND MANAGEMENT
Principles of conservation - Rain water harvesting - Soil health and fauna inputs in agriculture Biosphere reserves -Bioremediation.- Need & Scope of
Bioremediation-   Environmental applications-   Phytoremediation-
Biomagnification-Bioavailability.

UNIT V: EVOLUTION

REFERENCE BOOKS
CORE PAPER VI:
COMPARATIVE ANIMAL PHYSIOLOGY

OBJECTIVES
To derive an unified knowledge of the functions of animals, their parts, organs and their behaviour, through and understanding of their nutrition, respiration, circulation, excretion and physico-chemical coordination with a phylogenetic tinge.

UNIT-I: NUTRITION
Nutritive requirements – Digestion and adsorption of proteins, carbohydrates and lipids. Role of gastrointestinal hormones in digestion.

UNIT-II: RESPIRATION & CIRCULATION

UNIT-III: EXCRETION & OSMOREGULATION
Osmoregulation: Osmo – iono regulation in crustaceans, fishes, birds and mammals - hormonal control.

UNIT-IV: COORDINATION
UNIT-V: CHRONOBIOLOGY


REFERENCE BOOKS

LAB COURSE – II

A. MOLECULAR CELL BIOLOGY
1. Preparation of Buccal smears to show squamous epithelial cells.
2. Onion root tip squash preparation- Study of Mitosis.
3. Measurement of cell by using stage and ocular micrometer.
4. Slides (With reference to cell organelles).

B. MOLECULAR GENETICS
2. Mounting of salivary gland of *Drosophilla* and *Chironomous* larva.
4. Identification of blood groups A, B, AB, O and Rh factors with reasons.

C. BIOSTATISTICS
1. Data collection and frequency
3. Simple Correlation.
4. Test of Significance- Chi square test.
LAB COURSE – III

A. COMPARATIVE ANIMAL PHYSIOLOGY

1. Estimation of RQ in fish reference to light and temperature.
2. Estimation of salt loss and salt gain in fish.
3. Estimation of protein, carbohydrate and lipid in tissue of fish.
4. Estimation of bleeding, clotting time and haemoglobin concentration
5. Estimation of ESR and PCV.

A. ENVIRONMENTAL BIOLOGY

2. Estimation of salinity, Nitrites, Phosphates, Calcium and Alkalinity in water samples.
3. Collection, Isolation and Identification of Phyto and Zoo planktons.
4. Analysis of industrial effluents- TDS, TSS, BOD, COD.
5. Study of sandy, Muddy and rocky shore fauna with reference to adaptation to the environment
7. Field visit – To visit various industries & Processing Centres
   i. Tanneries
   ii. Dye making.
   iii. Sugar mill.
   iv. Dairy farm.
   v. Aquaculture farms. (Marine & Fresh water)
COMPULSORY PAPER
HUMAN RIGHTS

UNIT-I : HISTORICAL DEVELOPMENT AND THEORIES

UNIT-II INTERNATIONAL HUMAN RIGHTS

UNIT-III HUMAN RIGHTS DECLARATIONS

UNIT-IV INTERNATIONAL HUMAN RIGHTS

UNIT-V : HUMAN RIGHTS IN CHILDREN AND WOMEN

Books for Reference:

2. Human Rights, Questions and Answers, UNESCO, 1982
3. Mausice Cranston - What is Human Rights
4. Desai, A.R. - Violation of Democratic Rights in India
5. Pandey - Constitutional Law.
7. Human Rights, A Selected Bibliography, USIS.
9. G.S. Bajwa - Human Rights in India.
10. Amnesty International, Human Rights in India.
12. K. Cheous (Ed) - Social Justice and Human Rights (Vols 1-7).

Magazines:
1. The Lawyer, Bombay
2. Human Rights Today, Columbia University
3. International Instruments of Human Rights, UN Publication
CORE PAPER: VII
DEVELOPMENTAL BIOLOGY

OBJECTIVES
To imbibe the current knowledge pertaining to the development of animal embryos of diverse taxonomic groups through experimental analyses based on modern biological tools.

UNIT I: GAMETOGENESIS


UNIT II: FERTILIZATION


UNIT III: DEVELOPMENT


UNIT IV: ORGANOGENESIS AND REGULATION

UNIT V: GENES AND DEVELOPMENT


REFERENCE/BOOKS

CORE PAPER: VIII
MICROBIOLOGY AND IMMUNOLOGY

OBJECTIVES
To acquire a basic knowledge of the microbes in general and of the environmental, medical and industrial important microbes in particular in order to have an integrated approach in biology and functional basis of immunoglobulins, the mechanism, mediators, detection and application of antigen-reaction in the immune system.

UNIT I: STERILIZATION AND CULTURE TECHNIQUES

UNIT II: ENVIRONMENTAL MICROBIOLOGY
Microbial ecology, role of microorganisms in the productivity of ecosystems - Interactions between microorganisms and plants and animal- Microbiology of soil, water and air.

UNIT III: INDUSTRIAL MICROBIOLOGY
Industrial microbiology - Industrial uses of microbes - fermentation products, bioconversions - bioremediation. Products of industrial microbiology - Penicillin, fuel ethanol, vinegar, vitamin B12, citric acid, glutamic acid, protease. Food and Dairy microbiology - Microbes in food - Role of microbes in food production. Dairy and non-dairy products - fermented foods and alcoholic beverages. Pharmaceuticals (antibiotics, vaccines etc.)

UNIT IV: ANTIGENS & ANTIBODIES
Antigen - Antibody interaction and immunodiagnosics. MHC - Restriction, Organization and inheritance of MHC, Antigen processing and presentation.

UNIT V: MECHANISM OF IMMUNE SYSTEMS


REFERENCE


CORE PAPER: IX
BIOCHEMISTRY AND BIOPHYSICS

OBJECTIVES

To comprehended the chemical constituents of living matter, chemistry of food substances and their transformation in animal system. The energy changes associated with hormonal regulation. The structure of bimolecules energy transformation in living system and modern physical instruments for the exploration of knowledge in biology.

UNIT I: WATER

UNIT II: HORMONES, ENZYMES & VITAMINS
Chemistry and functions of steroid Hormones. Enzymes and Vitamins – Structure, Classification and Properties. Bioenergetics – High energy phosphates, Role of ATP, Biological Oxidation, Reductions – Mechanism of oxidative phosphorylation

UNIT III: BIO-KINETICS

UNIT IV: STRUCTURE OF BIOMOLECULES
UNIT V: PHOTO BIO PHYSICS


REFERENCE/BOOKS


LAB COURSE IV

A. DEVELOPMENTAL BIOLOGY
1. Developmental stages of frog.
2. Development stages of Chick embryo.
3. Study of larval forms (Nauplius, Zoa, Mysis, Bipinaria).

B. MICROBIOLOGY
1. Microscopic observation and identification of microorganisms in Pond water.
2. Types of bacteriophage, bacteria, fungi and algae from the prepared slides / Photographs from the book.
4. Identification of parasitic protozoans (e.g. Plasmodium, Entamoeba, Trypanosoma, Leishmania donovani)
5. Identification of bacteria - staining methods - Gram positive and Gram negative bacteria.
6. Demonstration of
   a. Isolation of single colonies streak plate and serial dilution.
   b. Enumeration of microorganisms spread plate and pour platemethods.
   c. Preparation techniques of culture medium for bacterial growth

C. IMMUNOLOGY
1. Study of antigen and antibody reaction through human blood group and Rh factor.
2. Study and identification of primary and secondary Lymphoid organs.
3. Demonstration of immunoelectrophoresis.
4. Slides showing Spleen TS, Thymus TS, Limp node TS and bone marrow.
5. Electrophoretic separation of serum proteins.
LAB COURSE V

A. BIOCHEMISTRY

2. Enzyme kinetics - anyone enzyme (Salivary amylase) Maltose standards, influence of enzyme concentration, time course, pH, Temperature, Substrate concentration (Lineweaver Burk Plot) on enzyme activity.
3. Qualitative analysis of urine - protein, glucose, Ketone and acetone bodies.
4. Chromatography: Determination of amino acids in body fluids and tissues of goat.
5. Quantitative estimation of glucose, protein, cholesterol, urea and creatinine in the serum of goat.

B. BIOPHYSICS

1) Principles and application of spectrophotometry or colorimetry-Demonstration
2) Polarizing microscope, phase contrast microscope, ultra & electron microscopes demonstration.
3) Surface tension by drop weight method.
4) Liquid lens-refractive index.
ELECTIVE PAPERS

1. BASIC CONCEPTS IN BIOTECHNOLOGY

OBJECTIVES
To familiarize the use of the data and techniques of engineering and technology in biology for the study of living organisms, or derivatives of thereof, to make or modify products or processes for specific use. Also, to find solution of problems concerning human activities including agriculture, medical treatment, industry and environment and to find out the biological application of data base.

UNIT I: GENETIC ENGINEERING

UNIT II: RECOMBINANT DNA TECHNOLOGY
Gene probe - molecular finger printing (DNA finger printing) - Recombinant DNA technology - RFLP - the PCR techniques - Genomic library - Blotting techniques - Southern blotting - Northern & Western blotting. cDNA - Changing genes - Site directed mutagenesis and protein engineering.

UNIT III: ANIMAL BIOTECHNOLOGY
Cell culture - Organ culture - Whole embryo culture - Embryo transfer - In vitro fertilization (IVF) technology - Dolly - In vitro fertilization and embryo transfer in human - Cryobiology. Transgenic animal. Human genome project- Human gene therapy.

UNIT-IV: MICROBIAL BIOTECHNOLOGY
Fermentation - bioreactor - Microbial products - Primary & Secondary Metabolites - enzymes technology - single cell protein (SCP).Biopolymers, Biopesticides and Biofertilizers.
UNIT V: ENVIRONMENTAL BIOTECHNOLOGY


REFERENCES

2. **BASIC CONCEPTS IN BIOINFORMATICS**

**Unit I**
Introduction to Bioinformatics, Databank search, Data management and interpretation, Data bases – sequence, structure & domain - Application and scope. Useful bioinformatics sites – Gene and protein expression data – protein interaction data.

**Unit II**
Biological Tools: Nucleotide sequence databases – protein sequence databases – specialised sequence data bases. Data retrieval and analysis – sequence retrieval system.

**Unit III:**
Sequence alignment: Sequence similarity searches – Amino acid substitution matrices, data base searches: FASTA and BLAST – PSI BLAST.

**Unit IV**
Multiple sequence alignment – local and global, databases for multiple alignment – phylogenetic tree analysis, role of phylogenetic tree analysis in evolutionary biology.

**Unit V**

**References**
2. Rashidi, Hooman H, Lukas K Buchler Bioinformatics Basics – (CRC)
3. Burkowski- Structural Bioinformatics – (CRC) –
4. Bexevanis Andress D- Bioinformation a practical guide to the analysis of genes and proteins - ed
5. Bujnicki, Janusz M.-Practical Bioinformatics (springer) -
3. STEM CELL BIOLOGY

Unit I
Introduction to stem cells, classification, Sources, programming and reprogramming, tissue specific stem cells Embryonic hematopoietic and neural stem cells, Classification and Sources

Unit II
Embryonic Stem Cells Blastoyst and inner cell mass cells; Organogenesis; Mammalian Nuclear Transfer Technology; Stem cell differentiation; Stem cells cryopreservation

Unit III
Application of stem Cells Overview of embryonic and adult stem cells for therapy Neurodegenerative diseases; Parkinson’s Alzheimer, Spinal Code Injuries and other Brain Syndromes; Tissue systems failures; Diabetes; Cardiomyopathy; Kidney failure; Liver Failure; Cancer; Hemophilia.

Unit IV
Human Embryonic Stem Cells and society. Human stem cells research : Ethical considerations; Stem cell religion consideration; Stem cell based therapies: Pre clinical regulatory consideration and Patient advocacy.

Unit V
Various model organisms. Stem cell isolation & characterisation techniques

Texts/References


4. NANO BIOTECHNOLOGY

Unit I:
Definition – Nano Science, Nano Biotechnology overview – Functional concept.

Unit II: Process in nano manufacturing
Bottom up, Top down assembly Nano material synthesis (Silver, Gold) – Chemical, Physical and Biological methods – Physico chemical characteristics. UV vis spectroscopy, FTIR, Transmission and Scanning Electron microscopic characterization.

Unit III:
Nobel metal – Nanomaterials (Silver & Gold) – Application in health and environmental concern. Surface modification, Smart scaffolds.

Unit IV:

Unit V:
Nanotoxicology – Nano particle interaction with cell. Accumulation and Elimination from biological system. Factors determine toxicological nature.

References:
1. Introduction to nanotechnology Henrik Bruus MIC – Department of Micro and Nanotechnology, Technical University of Denmark, Lyngby, spring 2004.

5. FISHERIES SCIENCE AND AQUACULTURE

OBJECTIVES:
The objective of the paper is to understand both the culture and capture fin and shell fisheries practices in India and World. Survey of seed resources and seed and feed production, animal health management, aquaculture and farm management and aquaculture system being practiced is giving a comprehensive idea to promote both the aquaculture and capture fisheries sectors and also to provide scope for employment opportunities.

UNIT – I: INTRODUCTION TO AQUACULTURE
Importance and objective of aquaculture – Global scenario: capture and culture fisheries status –
Indian scenario: capture and culture fisheries status – prospects and scopes
Fin and shell fisheries: edible fishes, crustaceans (prawn and crabs) and molluscs (clams, muscle, oyster and cephalopods)

UNIT – II: SURVEY OF SEED RESOURCES AND SEED & FEED PRODUCTION
Distribution and abundance of natural seed resources, collection methods and segregation. Artificial seed production - breeding under controlled condition, induced breeding technique, larval rearing, packing and transportation – Live feed culture and its importance: Microalgae, Rotifer and Artemia

UNIT – III: ANIMAL HEALTH MANAGEMENT
Infectious bacterial and viral diseases in fin fish and shell fish: Diagnosis, prevention and treatment – Disease control and management: Environmental management, Chemotherapeutic, vaccine, immunostimulant and probiotic

UNIT – IV: AQUACULTURE AND FARM MANAGEMENT
Brackish water aquaculture: Site selection, topography, water availability and supply, soil conditions and quality, design and layout, structure and construction
- Farm management: water quality management; temperature, salinity, pH, O₂, Co₂ levels, nutrients and trace elements

**UNIT – V: AQUACULTURE SYSTEM**

Traditional, extensive, semi intensive and intensive aquaculture system – Integrated aquaculture system: Paddy-cum-fish culture, poultry – cum-fish culture, pig-cum-fish culture – culture methods: Cage culture, pen culture and rack culture.

**REFERENCE BOOKS**

6. ENTOMOLOGY

OBJECTIVES
To catch up with the tremendous strides of expansion of knowledge in Entomology, this paper is meant to comprehend the classification of insects, economic importance of Entomology with special reference to beneficial insects, sericulture, insect pests & vector and their control, vector borne diseases etc.

UNIT I: INSECT CLASSIFICATION
Outline classification of insects with examples

UNIT II: APPLIED ENTOMOLOGY
Pollinators, Predators and scavengers- Biology of honey bees, lac insects and their management.

UNIT III: SERICULTURE

UNIT IV: AGRICULTURAL ENTOMOLOGY
Pest of Paddy with five examples, Pest of Sugarcane with two examples, Pest of Beverages –Coffee &Tea, Pest of stored products with five examples, internal feeder -external feeder- secondary pest and scavengers- Preventive and control measures

UNIT V: MEDICAL ENTOMOLOGY
REFERENCE BOOKS


7. MEDICAL LAB TECHNOLOGY

UNIT I: MAINTENANCE OF CLINICAL APPARATUS

Common glass wares in clinical laboratory, care and maintenance - Sterilization methods- Physical and chemical agents, Haemocytometry (Neubaur chamber), Blood components, functions, plasma & serum, Red cell indices (MCV, MCH, MCHC)

UNIT II: BLOOD

Haematopoietic system - Erythropoiesis, Leucopoiesis, Thrombopoiesis, Anaemia- classification, Blood clotting factors, mechanisms of coagulation, anticoagulants

UNIT III: HAEMATOLOGY

Bleeding time, Clotting time, Estimation of Haemoglobin, Erythrocyte sedimentation rate (ESR), Packed cell volume (PCV), Differential count, Total red blood cell count, Total white blood cell count, Platelet count, Eosinophil count, Reticulocyte count,

UNIT IV: PATHOGENS

Detailed account of Plasmodium, Entamoeba, Trypanosoma, Ascaris, Taenia solium

UNIT V: MICROTECHNIQUE

Fixation, Dehydration, Clearing, infiltration & impregnation, embedding, sectioning staining, and mounting

Spermatozoa count & Pregnancy test

REFERENCE BOOKS

3. Manoharan and Sethuraman 2003, Essentials Clinical Haematology, Jaypee Brothers (Medical Publishers (P) Ltd), New Delhi


7. Ramniksood, 1999, Medical Laboratory Technology- methods and interpretations, 5th Edition, Jaypee Brothers (Medical Publishers (P) Ltd), New Delhi


8. ETHANOPHARMACOLOGY

OBJECTIVES

UNIT 1: CLASSIFICATION

Classification, Identification and naming of medicinal plants – Classification of fruits, Vegetables, ornamental plants and other operational classifications.

UNIT II: FARM MANagements


UNIT III: DISEASES OF MEDICINAL PLANTS

Diseases caused on Leaf, roots and stem – Causing agents – Managements – control of pests – Physical, Chemical, Biological and legal pest control.

UNIT IV: FOLK LORE AND AROMATIC MEDICINAL PLANTS

Folklore Medical plants – Aromatic medicinal plants – Bio diversity conservation, export potential and Intellectual property rights – Indian pharmaceutical industries – source of financial aids for medicinal plants cultivation.

UNIT V: CHEMICAL COMPONENTS OF MEDICINAL PLANTS

Medicinal plants – Chemical components – Isolation, Purification of medicinal plant compounds – GC-MS, HPLC, NMR, IR

REFERENCES

9. REPRODUCTIVE PHYSIOLOGY AND ENDOCRINOLOGY

OBJECTIVES

To make the students to learn the objectives and scope of Physiology, endocrinology, anatomy, morphology and histology of endocrine tissues, hormones, hormonal regulation and development of reproductive organs and reproduction.

UNIT I: REPRODUCTION IN INVERTEBRATES

UNIT II: REPRODUCTION IN CHORDATES

UNIT III: PITUITARY AND THYROID GLANDS

UNIT IV: PANCREAS AND ADRENAL GLANDS

UNIT V: CRUSTACEAN AND VERTEBRATE REPRODUCTIVE ENDOCRINOLOGY
Neuroendocrine system in crustaceans – Endocrine control of moulting and metamorphosis and reproduction. Structure of mammalian testis and ovary – Hormones of testis and ovary – Estrous and menstrual cycle - Hormone control of lactation.

REFERENCES:


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