KVR Government College for Women (A), Kurnool

M.Sc., ZOOLOGY – (CBCS) SEMESTER SYSTEM

(EFFECTIVE FROM THE ACADEMIC YEAR 2021-22)

SEMESTER – I

Zoo 101: Structure, functions and anatomy of Non-chordates and Chordates

INVERTEBRATA:

UNIT -1: Taxonomy & Organizational Coelom, Nutrition& Digestion

International code of Zoological nomenclature, Taxonomical procedures.
Acoelomata, Pseudocoelomata, Coelomata, Proterostornia and Dueterostornia
Patterns of feeding and digestion in lower metazoan
Feeding in polychaeta, Mollusca, Echinodermata

UNIT-II: Respiration, Circulation, Nervous System and Larval Forms

Structure of Gill, lungs, trachea, Mechanism of Respiration
Circulatory system in Annelids, Arthropods & Mollusca
Advanced nervous system- Annelida, Arthropoda & Mollusca
Larval forms of Crustacea and Echinodermata

CHORDATA

UNIT- III: Evolutionary time scale, Integumentary system and Circulatory system

Evolutionary time scale, Eras, Periods & Epoch major events in evolutionary time Scale
Vertebrate integument and derivatives, Skin structure and function, glands, scales, Horns, claws, nails, hoofs, feathers, hair
Comparative anatomy of heart structure
Comparative account of aortic arches and portal system

UNIT – IV: Respiratory and Nervous System

Comparative anatomy of Respiratory organs
Comparative anatomy of brain and spinal cord
Organs of vision
Organs of Hearing and tactile responses

SUGGESTED READING MATERIAL:

1. Hyman, L.B. The invertebrates. Vol.l. Protozoa through Ctenophora, Mc Graw Hill Co., New York.
2. Barrington, EJ. W. Invertebrate structure and function. Thomas Nelson and Sons Ltd., London.
3. Jagerstein, G. Evolution of Metazoan life cycle, Academic Press, New York & London.
4. Hyman, L.H. The Invertebrates. Vol. 8. Mc Graw Hill Co., New York and London.
5. Hyman, L.B. The Invertebrates. Vol.2 Mc Graw Hill Co., New York and London.
6. Barmes, R.D. Invertebrate Zoology, III edition. W.b. Saunders Co., Philadelphia.
7. Russel-Hwlter, W.D. A biology of higher invertebrates, the Mc Millan Co. Ltd., London.
8. Hyman, L.B. The Invertebrates smaller coelomate groups, Vol. V. Mc.GrawHill, Co., New York
9. Read, C.P.Animal Parasitism. Prentice Hall Inc., New Jersey.
10. Sedwick, A. A student text book of Zoology, Vol.I1 and III. Central Book Depot, Allahabad
11. Parker, TJ., Haswell, W.A. Text Book of Zoology, Mc Millan Co., London.
12. Alexander, R.M. The Chordata. Cambridge University Press, London
13. Barrington, EJ. W. The Biology of Hernichordata and Protochordata. Oliver and Boyd, Edinbourgh.
14 Bourne, GH. The structure and functions of nervous tissue. Academic Press, New York
15. Carter, GS. Structure and habit invertebrate evolution Sedwick and Jackson, London.
16. Eecles, J. C. The understanding of the brain. McGraw Hill Co., New York and London.
17. Kingsley, J.S.Outlines of Comparative Anatomy of Vertebrates. Central Book Depot, Allahabad.

Zoo-105P- Structure, functions and anatomy of Non-chordates and Chordates:

1. Protozoa: Elpidium, Paramecium
2. Porifera: Spongilla, sycon, L.S. of Sycon, T.S. of Sycon
3. Coelenterata: Obelia colony, Physalia
4. Platy helminthes: Planaria, Echinococcus granulosus
5. Nemathehelminthes: Ascaris lumbricoides, Ancyclostoma duodenale
6. Arthropoda: Nauplius larva, House fly mouth parts
7. Mollusca: Chiton, Glochidium larva
8. Echinodermata: Ophithrix Fragilis, Bipinnaria larva.
9. Hemichardata: Balanoglassus

CHORDATA:

1. Protochordata: Herdmania, Amphioxus
2. Cyclostomata: Petromyzon, myxine
3. Pisces: Pristis, torpedo, Scoliodon, Sphyrna, Trygon, Chanos chanos, Anguilla, Hippo campus, Exocetous, Clarins.
4. Amphibian: Icthyophis, amblystoma, Hyla, Rhacophorour
5. Reptiles: Draco, Chameleon, Russels viper, Naja-Naja, Bungarus, Enhydrina, Crocodilus
6. Aves: Bubo, Columba
7. Mammalia: Orthorhynchus anatinus, tachyglassus, Aculestus, Pteropus, Funambulus, manis, loris
8. Comparative anatomy of vegtabrates:
9. Types of Sclaes: Placoid scales, Cycloid scales, ctenoid scales
10. Types of Feathers: Types of Feathers, Flight Feathers, Contour Feathers, Filoplume Feathers, Down Feathers, Semiplumes, Bristle Feathers
11. Comparative anatomy of horns: True horns, Pronghorns, Antlers, Knob horns, Hair horns.
12. Comparative anatomy of heart structure: Scoliodon L.S. of heart, Rabbit L.S. of heart, Rabbit internal structure of heart, Columba L.S. of heart, Dorsal view of heart of Frog, Ventral view of heart of Frog, Internal structure of Frog heart , Calotes L.S. of heart structure.
13. Comparative anatomy of lungs: Amphibian lung, Reptile lung, Aves lung, Mammalian lung. Comparative anatomy of brain: Amphibian brain, Aves brain

Zoo 102: Genetics and Evolution

UNIT - I:

Concept of gene: Allelles, Multiple alleles (ABO blood grouping and Rh factor), pseudoallelles; Interaction of genes (lethal genes, complementary genes, duplicate genes)

Gene mapping methods: Linkage-complete and Incomplete linkage; Linkage maps, Recombination.

Crossing over: Types (Somatic or mitotic crossing over and Germinal or meiotic crossing over.

Mutations: a) spontaneous and b) induced mutations; c) Molecular basis of mutations

UNIT- II:

a) Numerical and Structural abnormalities of human chromosomes and syndromes

a) Human karyotype and human genome

Sex linked inheritance

Pedigree analysis, Inborn errors of metabolism- Phenylketonuria, alkaptonuria, Sickle cell anemia;

Eugenics: a) Positive eugenics, Artificial insemination, sperm banks b) Negative eugenics, Amniocentesis, consanguinity, Genetic counseling

UNIT – III:

Emphasis on Darwinism

Neo-Darwinism

Role of isolating mechanisms

Models of speciation (Allopatric, sympatric and parapatric)

UNIT – IV:

A detailed account on destabilizing forces

i. Natural Selection ii. Mutation iii. Genetic drift

Phylogenetic gradualism & punctuated equilibrium

Micro & Macro evolution

Gene evolution and Amino acid sequence and phylogeny

SUGGESTED READING MATERIAL

1. Genetics - Monrve W. Strickberger. 3rd Ed., May, 2000.
2. Genetics-K.B.Allluwallia-1985.
3. Principles of Genetics - EJ. Gardner. MJ. Simmons & D.P. Snustad.
4. Molecular Biology of genes- Watson, J.D., N.H. Hopkins, J.W. Roberts, J.A. Steitz &A.M.
   Weiner. The Benjamin Cummings publishing company. Inc. Tokyo.
5. Basic Human Genetics- EJ. Mange, Arthur P. Mange. Indian Print, 1997.
6. Genetic disorders of Man by M.R. Goodman.
7. An introduction to modem genetics by Ch. Waddinsgton
8. Dobzhansky, Th. Genetics and origin of species, Columbia University press.
9. Dobzhansky, Th., F.J. Ayala, GL. Stebbins and J .M. Valentine Evolution: Surjeet publications, New Delhi latest edition.
10. P.A. Moody Introduction to Evolution II ed/latest: Kalyani publishers, New Delhi.
11. Hartl, D.L. A primer of population genetics, sinauer Associatesm Inc., Massachusetts.
12. Peter Volpe E. Understanding Evolution, University Book stall, New Delhi.
13. An introduction to genetic analysis. Griffiths, A.J .F., J.B. Miller, D.T. Suzuki, R.C. Lewontin & W.M. Gelbark, W.H. Freeman and Company, New York.

Zoo-105P - LIST OF PRACTICALS OF GENETICS AND EVOLUTION

1. Blood grouping
2. Rh factor demonstration
3. Mendelian ratios and its related Problems
4. Karyotyping
5. Syndrome charts – demonstration
6. Demonstration of Barr bodies
7. Problems on Hardy Weinberg's law
8. Test for colorblindness
9. PTC taste test
10. Estimation of DNA by Diphenylamine method
11. Estimation RNA by orcinol method

Zoo 103: Biomolecules and Metabolic Regulation

UNIT–I

Chemical foundations of biology: Chemical bonds, Principles and Laws of thermodynamics.

Carbohydrates: Definition and Classification. Structure and function of important Mono, Oligo and Polysaccharides.

Intermediary Metabolism-I: Glycolysis, TCA Cycle and and Electron Transport System and their Bio-medical importance.

Intermediary Metabolism-II: Gluconeogenesis, Glycogenolysis and Glycogenesis HMP Shunt and their Bio-medical importance.

UNIT–II

Proteins: Definition and Classification. Structure and function of important Proteins: Haemoglobin, Myosin and Actin.

Amino acids: Classification, Properties.

Catabolism of Proteins and Amino acids-I: Biosynthesis of Urea- Detoxification of Ammonia- Metabolic disorders of Urea cycle.

Catabolism of Proteins and Amino acids-II: Phenylalanine, Tryptophan, Biosynthesis and degradation of Polyamines and their Bio-medical importance.

UNIT–III

Lipids and Fatty acids: Definition and Classification.

Structure and biological functions of various classes of lipids: Triacylglycerols (tri-glycerides), Phospholipids, Glycolipids.

β- oxidation of fatty acids, Oxidation of unsaturated fatty acids, Ketogenesis.

Biosynthesis of long chain fatty acids (Palmitic acid), Clinical aspects.

UNIT–IV

Nucleic acids: Structure of purines and pyrimidines. Types of DNA and RNA.

Biosynthesis of purine nucleotides, Catabolism of purines.

Biosynthesis of pyrimidine nucleotides, Catabolism of Pyrimidines,

Clinical disorders of purine and pyrimidine metabolism; Hyperurecemia or gout; Hypo-Urocemia, Orotic aciduria

SUGGESTED READING MATERIAL:

1. D. Voet and J.G Voet, Biochemistry, 1. Wiley & Sons.
2. David L. Nelson and Michael M. Cox, Lehninger; Principles of Biochemistry, McMillan Lange Medical
3. Robert K.Murrey, D.K. Granner, P.A. Mayes and V.W. Rodwell; Harper's Biochemistry, Worth Publishers.
4. 1. Biochemical Techniques: Theory and Practical. 1987. J.P. Robft and B.J. White, Waveland Press, Inc. Prospect Heights, IL, pp. 407.
5. 2. Biochemistry. 1992. R.H. Abeles. Panima Publication. pp 894.
6. 3. Principles of Biochemistry. 2nd ed. 1993. A.L. Lehninger, D.L. Nelson, M.Cox. Panima Publications. pp 1090.
7. 4. Harper's biochemistry. 1988. R.K. Murray. D.K. Granner, P.A. Mayes. Printice Hall International.
8. Biochemistry. 1998. 2nd ed. Zubay. Addision – Wesley Publication.
9. Biochemistry. 1998. 3rd ed. Luber Stryer. Freeman International.
10. Biochemistry of the Nucleic acids. 1992. 11th ed. R.L.P. Adams, J.T. Knowler, D.P. Leader. Chapman and Hall.
11. Proteins: Structure, function and evolution. Dickerson & Geis, 2nd Edn. Banjamin / Cummings, Meulo park, Callf 1983.
12. The Proteins: Neurath and Hill, 3rd Edn. Academic New York.
13. Biochemistry, A problem approach, 2nd ed. Wood, W.B., Addison Wesley, 1981.
14. Biological Chemistry, Mahler & Cordes.
15. Text Book of Biochemistry West, E.S. Todd, Mason & Vanbruggen, Macmillian & Co.
16. Principles of Biochemistry – White – A, Handler, P and Smith E.L. Mc. Graw–Hill.
17. Biochemistry – Cantrow, A. Sehepartz. B. Sunders – Japan.
18. The Carbohydrates: Pigman & Hartman Vol. II – A & II – B.
19. Biochemistry Voet & Voet.
20. Comprehensive biochemistry – Florkin & Storz, Academic Press.
21. Organic Chemistry, T.L. Eeunar, ELBS.
22. Organic Chemistry, J.P.Cohen, Vol.3, Edward Arnold & Co.
23. Basic Principles of organic chemistry Roberts & Cashino (Benjamin).

Zoo-106P-PRACTICALS OF BIOMOLECULES AND METABOLIC REGULATION:

1. Estimation of total soluble and structural proteins
2. Estimation of free amino acids
3. Estimation of Total carbohydrates
4. Estimation of Total cholesterol
5. Estimation of Ascorbic Acid
6. Estimation of Total Lipids

Zoo 104: Biophysical and Biochemical techniques

UNIT-I

Microscopy – Light, Phase, contrast (Inverted), confocal electron microscopy: Scanning EM and Confocal EM.

Centrifugation – Types of rotors, preparative and analytical centrifuges

Concentration of macromolecules – salting in and salting out, flash evaporation, lyophilization, Dialysis.

Chromatography – paper, thin layer, gas, HPLC

UNIT-II

2.1. Principles and Application of Electrophoresis: Paper, Agarose, PAGE, SDS PAGE and Iso-Electric focusing and 2 Dimentional electrophoresis (2-DE)

Blotting techniques-Southern, Northern and western blotting

Spectroscopy- Absorption and Emission principles - Principle and application of UV-visible, Spectrofluorometer, flame photometer, Atomic Absorption, NMR in Biology

Radio isotope techniques – types of radio isotopes, detection and measurement of radiaoactivity, Applications of radio isotopes in biological sciences and safety measures

UNIT-III

Microtomy and staining procedures– types of microtomes, types of stains, staining procedures of biological materials,Immunohistochemistry, Immunofluroscence and co-localization staining procedures and applications

Voltage clamp and patch-clamp techniques and its physiological applications

Kymograph

Oscilloscope

UNIT-IV

Design and functioning of tissue culture laboratory, Primary culture, secondary culture, cell line,confluence

Cell proliferation measurements

Cell viability testing

Culture media preparation and cell harvesting methods

SUGGESTED READING MATERIAL (ALL LATEST EDITIONS)

1. Animal C,ell Culture – A practical approach, Ed.John. R. W.Masters IRL Press.
2. Introduction to Instrumental analysis, Ronert Braun. McGraw Hill Intemational edition.
3. A Biologists Guide to Principles and Techniques of Practical Biochemistry, K. Wilson & K.W. Goulding, ELBS Edn.
4. Advanced Micropipette Techniques for cell physiology. K. T. Brown and D.G. Hamming
   IBRO, Hand Book Series. A Willey Interscience publications, John Wiley and Sons, New York.
5. Neuro anatomical Techniques, N.J. Stransfed and T.A. Miller Springer Verlag, New York Heidelberg, Berlin, 1980.
6. Principles of Neuropsychopharmacology by Robert S. Feldman, Jerrold S. Meyer and Unida quenzer. Sinancer Associates Inc. publishers. Sunderland, Massachusetts, 1997.
7. General Zoological Microtechniques - P.M. Weesner.

Zoo-106P-Practicals of Biophysical and Biochemical Techniques

1. Isolation of mitochondria from rat liver
2. Verification of Beer-Lambert's law
3. Preparation of block by using paraffin wax microtome
4. Separation of chloroplast pigment by paper chromatography
5. Separation of proteins by using sodium dodecyl sulphate polyacrylamide electrophoresis
6. Electrophoretic separation of DNA (Agarose gel electrophoresis).
7. Separation of amino acids by paper-chromatography

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M.Sc., ZOOLOGY – (CBCS) SEMESTER SYSTEM

(EFFECTIVE FROM THE ACADEMIC YEAR 2021-22)

SEMESTER – II

Zoo 201: Biostatistics & Computer Applications in Biology

UNIT – I

Definition - scope of biostatistics
Measures of central tendency – arithmetic mean, median and mode
Measures of dispersion -range, mean deviation, standard deviation, Standard error
Co-efficient of variation, types of correlation, linear regression analysis

UNIT –II

Concepts of probability, laws; Normal probability distribution and its application
Tests of significance: Students t-Test (simple, paired), F- test
Application of $\chi 2$ (chi-square) test in biology and testing the goodness of fit.
Analysis of Variance (ANOVA), SPSS

UNIT – III

History of Computers, classification of computers, computer generations
Input, output processing and storage devices –, hard disk, CD – ROM, DVD etc.
Operating system – Introduction – types of operating systems
MS – Office (ACCESS, EXCEL, WORD, POWER POINT), applications of computers in biology

UNIT –IV

Internet basics; WWW, HTML and HTTP
Scope, importance and status of Bioinformatics
Biological databases, NCBI, Pubmed (Gene bank and Protein sequence database)
Sequence analysis: Pair wise and multiple sequence alignment; human genome project

SUGGESTED READING MATERIAL

1. Computers to-day by Suresh K. Basandra (1999), Published by Galagotia Publications, Pvt. Ltd., New Delhi
2. Microsoft Office, by Setultz, 1997.
3. Database processing by D.M. Kroenke, Galgotia Publications, 1990.
4. Introduction to Biostatistics – By Sokal – Rohlf (2nd Edn) freeman International Editor,.
5. Bio – Statistics – An introductory text – Goldstein, A The Macmillan Co., New York,1971.
6. Bio – Statistics - By Lewis Alvin E. Affiliated East – West press (P)Ltd., 1971.
7. Statistical analysis in Biology by Mather, K Chapman and Hall, London, 1972.
8. Probit analysis by finney, D.J.S. Chand & Co., Ltd,. New Delhi
9. Biostatistics by Lewis Alvin (1971) Affiliates East West Press Pvt., Ltd., New Delhi.
10. Statistical methods in Biology by Bailey Norman T.J. (1965) The English Language Book Society & the English university Press Ltd.
11. Bioinformatics. Murthy, C.S.V. Himalaya Publishing House, Hyderabad
12. Bioinformatics by Andreas D. Baxevanis and B.F. Francis Ouellette, 2nd Ed., 2002.
13. Basic Bioinformatics by S. Ignaeimuthi, S.J. Narosa publications, 2005

Zoo 205P- practical of Biostatistics & Computer Applications in Biology

(a) Statistics

1. Problems on Mean and Median.
2. Problems on Standard Deviation.
3. Problems related to X2 test, Student T Test and Probability
4. Problems on Correlation.
5. Problems related to test of significance
6. Analysis of variance (ANOVA)
7. Probit analysis
8. Regression curves
9. Generation of graphs using MSExcel

(b) Computers

1. Literature collection using INTERNET, search engines, websites, browsing and downloading for scientific investigation.
2. Creating an e-mail account, sending and receiving mails.
3. Application of excel sheet for data processing.
4. Preparation of power point presentation with software.
5. Representation of statistical data by Histograms and Pie diagrams.

(c) Bioinformatics

1. Study of Internet resources in Bioinformatics. E.g. NCBI and EMBL.
2. Searches on MEDLINE and PubMed bibliographic databases.
3. Multiple Sequence Alignment.
4. Construction of Phylogenetic Trees for DNA and Proteins.
5. Sequence Retrieval from Databases.
6. Building of Molecules.
7. BLAST, FASTA programs for sequence database search.
8. ORF finder (open reading frame finder)

9. Clustal –W, Phylogenetic Analysis using clustal –X
10. Prot Scale, CFSSP and SMART
11. Sequence data retrieval in Fasta format from NCBI database
12. Searching with Blast
13. Secondary structure Prediction
14. Viewing of PDB files using Rosmol

SEMESTER – II

Zoo-202: Cell Biology and Immunology

UNIT-I.

Structure and Function of intracellular organelles: Plasma membrane, Mitochondria, Golgi complex, Endoplasmic reticulum, Lysosomes, Nucleus.

Membrane: Structure of fluid mosaic model membrane, Lipid bi layer and Membrane proteins.

Membrane transport: Active transport – Passive transport – Diffusion – Osmosis – Ion channels, Membrane pumps

Vesicular traffic and Protein sorting: Translocation of proteins in to mitochondria – Endoplasmic reticulum and Golgi - Endocytosis – exocytosis and Apoptosis.

UNIT-II

Cell cycle and division: Mitosis, Meiosis, Regulation of cell cycle by cell growth, Cell cycle check points

Functions of cell surface receptors (G-protein coupled receptors, Tyrosine kinases, cytokine receptors).

Models of cell-cell signaling (steroid receptors, Nitric oxide and Carbon monoxide).

Pathways of intracellular signaling transduction (c-AMP pathways, cyclic c-GMP, phospholipids and Ca2+, Ras, Raf and MAP kinases).

UNIT-III

Cells of the immune system: Lymphoid cells, Mononuclear cells, granulocytic cells, Mast Cells

Organs of the immune system- primary and secondary lymphoid organs, lymphatic system

Antigens: Antigenic determinants or Epitopes, Immunogenicity, Haptens, Adjuvants

Innate (Non-specific): Anatomical barriers, Phagocytosis, Physiological barriers, inflammatory barriers.

UNIT-IV

Humoral immunity: Immunoglobulins (fine structure of immunoglobulins and Classes).

Cell mediated immunity: Mechanism of cell mediated immunity; brief account on Antigen Presentation, Major Histocompatability complex

Antigen-antibody interactions: Affinity, Avidity, Cross-reactivity, precipitation reactions and Agglutination reactions and ELISA.

Brief account on immunological disorders:

a) Tolerance to autoimmunity
b) Transplantation
c) Immunodeficiency diseases
d) Immunization (active and passive immunity)

SUGGESTED READING MATERIAL:

1. An introduction to Immunology by C.Y. Rao, Narosa publishing house, 2002.
2. Cell and Molecular Biology by EDR De Robertis and EMR De Robertis Jr, Indian Edition, B.I. Publicaitons, Pvt. Ltd.
3. Cell Biology (Fundamentals and Applications) By Gupta/ Jangir, 2001; Agrobios, India.
4. Harpers Review of Biochemistry, Murray, Granier, Mayes and Rodwell, Lange Medical Publications, 25th Ed.
5. Human Physiology by Stuart Era Fox, W.M.C. Brown Publishers, USA 1984 or Recent Edition.
6. Immunology introductory textbook by Nandini Shetty, Wiley Eastern Ltd.
7. Kuby, J. (1998) Immunology, W.H. Freeman and Company, New York.
8. Roitt, I.,Brostoff, J. Male, D. (1999/2000) Immunology, 4th Edition. Harcourt Brace and Company Asia, Pvt. Ltd., Singapore.
9. The Cell (A Molecular Approach) by Geoffrey M. Cooper, 2nd Edn. 2000, ISBN.

Zoo-205P-PRACTICALS OF CELL BIOLOGY AND IMMUNOLOGY

1. Microscopy
2. Mitosis in Onion root tips
3. Meiosis in Onion flower buds
4. Demonstration of motility of bacteria by hanging drop technique
5. Staining of Nuclear material of bacteria
6. Detection of salivary gland chromosomes in Chironomus larvae
7. Isolation of Mitochondria
8. Enumeration of Red blood cells
9. Enumeration of White blood cells
10. Differential count of Leukocytes.

SEMESTER – II

Zoo 203: Physiology of Animals

UNIT-I:

Aim and scope of physiology; General physiological functions and principles. Validity of comparative approach of physiology.

Feeding mechanisms and regulation: Nutrition, Autotrophs, Heterotrophs, Feeding Mechanisms, Digestion, Digestion in mouth, swallowing, Peristalsis, Digestion in the Stomach, Gastric secretion, Gastric juice, Regulation of Gastric secretion, Activities of Gastric Secretion, Digestion in small intestine.

Comparative physiology of digestion: Chemical Action: intracellular digestion, extracellular digestion. Digestive enzymes: Carbohydrases, Lipases and Esterases, Proteinases, Other Digestive enzymes, Absorption.

Gastro-intestinal Hormones in regulation of digestion.

UNIT-II:

Respiration and Metabolism: Types of respiration, Respiratory organs, Mechanism of Respiration.

Circulation of body fluids: Major types of body fluids, Blood, General properties of blood, Composition of blood, Blood groups and Transfusions.

Patterns on nitrogen excretion among different animal groups: Introduction, Nitrogenous Waste Products, Morphology of the excretory system in different groups of animals, Mechanism of urine formation.

Osmoregulation in different animal groups (aquatic and terrestrial).

UNIT- III:

Thermoregulation: Temperature as an environmental factor, Thermoregulation in Invertebrates, Thermoregulation in vertebrates.

Poikilothermic animals: Temperature relation in poikilotherms, Aquatic poikilotherms, Terrestrial poikilotherms, Homoeothermic animals: Temperature relations of homeotherms, Physical heat regulation, Chemical heat regulation.

Hibernation & Aestivation.

Biological Rhythms.

UNIT- IV:

Bioluminescence: Occurrence of bioluminescence among different animals, Mechanism of light production, Control of bioluminescence, Functions of luminescence.

Chromatophores and regulation of their function: Colour production, Chromatophore pigments, Mechanism of action of chromatophore.

Structure and function of muscles, Theories of muscle contraction.

Physiology of receptors (Photo, Phono and chemo receptors).

SUGGESTED READING MATERIAL:

1. C.L. Prosser. Comparative Animal Physiology. W.B. Saunders & Company.
2. C.L. Prosser. Environment and Metabolic Physiology. Wiley-Liss, New York.
3. R. Eckert. Animal physiology, Mechanism and Adaptation. W.H. Freeman & Company.
4. Schiemdt-Nielsen. Animal Physiology, Adaptation and Environment. Cambrdge.
5. W.S. Hoar. General Comparative Animal Physiology.

Zoo-206P- PRACTICALS OF PHYSIOLOGY OF ANIMALS

1. Determination of Urea, creatine in blood-Human/Rat
2. Determination of serum content of uric acid , Cholesterol- Human/Rat
3. Effect of injection of insulin/glucagon on the blood sugar and liver glycogen in Rat/Mouse
4. Estimation level of excretory ammonia
5. Estimate level of activity of hepatic and brain glutamate dehydrogenase
6. Estimate level of amino acid content of muscle, gill, brain and liver.
7. Estimate levels of activities of the following enzymes –AAT, ALAT, ACP, LDH and SHD.
8. Blood collection and blood groups determination.
9. Temperature variations in poikilotherms and homoeothermic animals
10. Demonstration of rate of oxygen consumption in crab/fish
11. Assay of amylase

SEMESTER – II

Zoo 204 OE: Sericulture

UNIT - I The cultivation of mulberry

The Morphology and Physiology of mulberry
Types of mulberry
Selection and Establishment of the mulberry field
Training Methods and Harvesting method & Management of mulberry field

UNIT - II Rearing of Silkworms

Planning of Rearing
Preparation of Rearing
Rearing and Environment
Rearing of young and advanced stage larvae & Mounting cocoons production and Harvesting of cocoons

UNIT - III Diseases of Silkworm and Preventive measures

Viral diseases
Bacterial diseases
Fungal diseases
Other diseases of silkworm & Silkworm disease control measures

UNIT - IV Silk Dying and Finishing

Machine & chemical finishing
Commonly used equipments and commonly used unit machines
Physical and Chemical testing methods for quality of products / semi-finished products
Measurement of industrial effluents & Administration and improvement of Sericulture Management

SUGGESTED READING BOOKS

1. Silkworm Rearing, Oxford & IBH Publishing CO. Pvt. Ltd. New Delhi -1997.
2. Silk Dying and Finishing, Oxford & IBH Publishing Co. Pvt. Ltd. New Delhi - 2000.