

Department of Zoology

BSC SEM-I P-I

COURSE CODE:18.010

B.Sc. Part-I Semester-I

Program-Zoology

Course- I Animal Diversity-I (Lower Non-Chordata)

Objective- Brief introduction of structural and functional morphology of different lower non-chordates and their taxonomic position in animal kingdom.

Learning outcome- After learning this course the students will be able to-

1. Explain major differences between microscopic single cell and multicellular animal
2. Describe the fundamental difference among animal body plan and relate them to habitat structure and function and life cycle .
3. Evolutionary relationship among phyla
4. Disease causing lower animals.
5. Related human diseases
6. Economic importance of lower animals.

Assessment

1. One theory exam related to above course.
2. Few exercises related to above course in practical exam.
3. Mock test.

Books (Recommended)

1. Text Book of Invertebrate - R.L. Kotpal
2. Biology of Non Chordates - H.C. Migam
3. Invertebrate Zoology - Jordon &Verma
4. The Invertebrate - L.H. Human
5. Elements of Taxonomy - E. Mayer
6. A Text Book of Zoology-I - Parker &Haswell

BSC SEM-I P-II

COURSE CODE:18.020

B.Sc. Part-I Semester-I

Program-Zoology

Course-II Cell biology-I

Objective: Fundamental knowledge of microscopic techniques and understanding of cell functioning.

Learning outcome: Student who successfully complete this course will be able to-

1. Understand the principle and uses of microscope which are most important equipment for the study of the cell
2. Describe levels of organization and related functions in plants and animal cells/pro or eukaryotic cells
3. Describe the structure and function of the cells or
Describe cytological biochemical and physiological aspects of the cells.
4. Explain cellular energy transactions
5. Describe cytoskeleton of a cell and its importance
6. Understand that how and why a cell is a unit of life

Assessment

1. One theory exam related to above course.
2. Few exercises related to above course in practical exam.
3. Mock test.

Books (Recommended)

1. Cell Biology, Genetics & Evolution – Verma and Agrawal
2. Cytology - Veer BalaRastogi
3. Molecular Cell Biology - Karp
4. Molecular Cell Biology - B. Albert
5. Cell Biology & Genetics - P.K. Gupta

BSC SEM-I P-III

COURSE CODE:18.030

B.Sc. Part-I Semester-I

Program-Zoology

Course-III Genetics-I

Objective-This course covers the heredity and gene expression and interactions

Learning outcomes- Students who successfully complete this course will be able to-

1. Explain different laws of heredity
2. Describe dominant and recessive traits and its role in variety of gene expressions
3. Describe the gene which mask the expression of normal gene by interacting them
4. Describe the inheritance of genes which are located on autosome and sex chromosome
5. Know about the reasons for genetic abnormality in human beings.
6. Understand the importance of variation in plant and animal including human beings that how homogeneity of gene accumulate bad characters in society and heterogeneity separate the bad genes and provide healthy society.

Assessment

1. One theory exam related to above course.
2. Few exercises related to above course in practical exam.
3. Mock test.

Books (Recommended)

- | | | | |
|----|-------------------------|---|------------------|
| 1. | Cell Biology & Genetics | - | P.K. Gupta |
| 2. | Genetics | - | E.J. Gardner |
| 3. | Genetics | - | Veer BalaRastogi |
| 4. | Genetics | - | P.S. Verma |

BSC SEM-I

COURSE CODE:18.040

B.Sc. Part-I Semester-I

Program Zoology

Course-Practical

Objective-Study and experiments related to all three course materials

Learning outcome-

1. Handle laboratory microscope and other equipments .
2. Prepare permanent slides.
3. Solve genetic problems.
4. Identify the specimens of different animals.
5. Identify the microscopic whole organisms.
6. Study the slides of important structure of certain animals.

Assessment

1. Oral test and revisions.
2. Assessment on the basis of records maintained related to above course.
3. Mock test for spotting
4. Practical exam at the end of semester

Books (Recommended)

- | | | |
|-----------------------------------|---|----------------|
| 1. Practical Zoology (Vol.-I) | - | Yadav-Varshney |
| 2. Practical Zoology-Invertebrate | - | P.S. Verma |
| 3. Practical Zoology-Invertebrate | - | S.S. Lal |

BSC SEM-II P-I

COURSE CODE:18.050

B.Sc.Part-I Semester-II

Program-Zoology

Course- I Animal Diversity-II (Higher Non-Chordate)

Objective- Brief Introduction of structural and functional morphology of different higher non-chordates and their taxonomic position in animal kingdom.

Learning outcome- After learning this course the students will be able to know

1. Describe evolutionary relationship among phyla.
2. Describe the structural and functional organization of certain type study.
3. Describe affinities among phyla.
4. Describe importance of few beneficial insect.
5. Related human diseases
6. Economic importance of higher animals.

Assessment

1. One theory exam related to above course.
2. Few exercises related to above course in practical exam.
3. Mock test.

Books (Recommended)

7. Text Book of Invertebrate - R.L. Kotpal
8. Biology of Non Chordates - H.C. Nigam
9. Invertebrate Zoology -Jordon &Verma
10. The Invertebrate -L.H. Human
11. Elements of Taxonomy -E. Mayer
12. A Text Book of Zoology-I - Parker &Haswell

BSC SEM-II P-II

COURSE CODE:18.060

B.Sc. Part-I Semester -II

Program-Zoology

Course-II Cell biology II

Objective-This course covers the Organization of chromosome, elementary idea of cell cycle and cell transformation.

Learning outcome-Student who successfully complete this course

1. Describe the organization of nucleoprotein and its importance.
2. Describe the cell division in somatic and germ cells.
3. Explain soul organelle (nucleus) and biogenesis of important organelles which play important role in protein synthesis.
4. Describe the cell cycle and cell transformation.
5. Describe the cancer causing gene.
6. Relate normal and abnormal cellular structure and their function.

Assessment

1. One theory exam related to above course.
2. Few exercises related to above course in practical exam.
3. Mock test.

Books (Recommended)

1. Cell Biology, Genetics & Evolution - Verma & Agrawal
2. Cytology - Veer Bala Rastogi
3. Molecular Cell Biology - Karp
4. Molecular Cell Biology - B. Albert
5. Cell Biology & Genetics - P.K. Gupta

BSC SEM-II P-III

COURSE CODE:18.070

B.Sc. Part-I Semester-II

Program-Zoology

Course-III Genetics and Evolution

Objective- This course introduce heredity chromosome, mutation and some aspect of evolution.

Learning outcome:

1. Describe the chromosome theory molecular genetics and quantitative genetics.
2. Describe sex determination in offspring which is very important to know students that who is responsible for determination of sex to prevent domestic violence.
3. Importance of mother cytoplasm in cytoplasmic inheritance.
4. What happen when number and structure of chromosome changes
5. Able to understand about importance of reducing and oxidizing atmosphere and origin of life.
6. Criticism and evidences of related to evolution.

Assessment

1. One theory exam related to above course.
2. Few exercises related to above course in practical exam.
3. Mock test.

Books (Recommended)

- | | | | |
|----|-------------------------|---|------------------|
| 1. | Cell Biology & Genetics | - | P.K. Gupta |
| 2. | Genetics | - | E.J. Gardner |
| 3. | Genetics | - | Veer BalaRastogi |
| 4. | Genetics | - | P.S. Verma |
| 5. | Evolution | - | M.W. Strikberger |
| 6. | Organic Evolution | - | Veer BalaRastogi |

BSC SEM-II

COURSE CODE:18.080

B.Sc. Part-II Semester-II

Program - Zoology

Course-Practical

Objective- Study and experiments related to three courses of its program.

Students who successfully completed this course will be able to-

1. Describe number of specimen and slides.
2. Dissect the animal to study the different organs and organ system.
3. Get knowledge about the instruments and slide preparation.
4. Prepare different grades of alcohol required in permanent mounting of materials.
5. Understand evolutions in animals with the help of different modals .
6. Maintain records of experiments that learn in lab.

Assessment

1. Oral test and revisions.
2. Assessment on the basis of records maintained related to above course.
3. Mock test for spotting
4. Practical exam at the end of semester

Books (Recommended)

- | | | |
|-----------------------------------|---|----------------|
| 1. Practical Zoology (Vol.-I) | - | Yadav-Varshney |
| 2. Practical Zoology-Invertebrate | - | P.S. Verma |
| 3. Practical Zoology-Invertebrate | - | S.S. Lal |

BSC SEM-III P-I

COURSE CODE:18.090

B.Sc. II Semester-III

Program Zoology

Course-I Animal diversity III(Chordata-I)Protochordata, Agnatha& Pisces

Objective- Brief Introduction of structural and functional morphology of different Chordates (Protochordates, Agnatha and Superclass: Pisces) and their taxonomic position in animal kingdom.

Learning Outcomes- After learning this course the students will be well known to-

1. Explain external feature, structural organization, functional morphology of lower chordates and vertebrates
2. Explain major differences between animals without brain box (acraniata) and animals having brain box (craniata)
3. Describe the fundamental difference among animals without jaw and animals having jaw to understand its structure and function
4. Evolutionary relationship among sub-phyla urochordata, cephalochordate and vertebrata
5. Get clear concept about retrogressive metamorphosis and
6. Right aspects of replacement of notochord to vertebrae and conversion anamniotes to amniotes

Assessment

1. One theory exam related to above course.
2. Few exercises related to above course in practical exam.
3. Mock test.

Books (Recommended)

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|----|-------------------------|---|-----------------|
| 1. | Text Book of Vertebrate | - | R.L. Kotpal |
| 2. | Biology of Chordates | - | H.C. Nigam |
| 3. | Vertebrate Zoology | - | Jordon &Verma |
| 4. | Chordate Zoology | - | P.S.Verma |
| 5. | Text Book of Zoology-II | - | Parker &Haswell |

BSC SEM-III P-II

COURSE CODE:18.100

B.Sc. Part-II Semester-III

Program-Zoology

Course-II Reproductive Biology

Objective- To study the structure, formation and function of gametes

Learning Outcomes- After learning this course the students will be able to-

1. Aware about importance of estrous and menstrual cycle in female body
2. Understand role of gametogenesis to maintain the fixed chromosome number generation after generation
3. Know the taxonomy of egg
4. Draw and describe the structure of egg and sperm
5. Know the process of fusion of sperm and ova
6. Understand later steps in zygote after fertilization

Assessment

1. One theory exam related to above course.
2. Few exercises related to above course in practical exam.
3. Mock test.

Books Recommended

- | | | | |
|----|-------------------------------------|---|------------------|
| 1. | Chordate Embryology | - | P.S. Verma |
| 2. | Chordate Embryology | - | Veer BalaRastogi |
| 3. | Developmental Biology of Vertebrate | - | S.P. Mishra |
| 4. | Embryology | - | P.C. Jain |

BSC SEM-III P-III

COURSE CODE:18.110

B.Sc. Part II Semester III

Program - Zoology

Course III-Mammalian Physiology I

Objective : Physiology of food digestion, absorption and fate of absorbed monomers, which circulate in the body through involvement of heart and blood vessels.

Learning out comes- Students who successfully completed this course will be able to-

1. Explain why food is important for body and how it reaches to in each cell.
2. Describe certain metabolic pathways which play important role in energy production.
3. Explain the energy production in Aerobic an anaerobic astrosphere.
4. Describe blood groups ,blood composition and blood clotting mechanism.
5. Structure and function of blood pumping organ(heart) and clinical use of blood.
6. Describe cardiac cycle and ECG.

Assessment

1. One theory exam related to above course.
2. Few exercises related to above course in practical exam.
3. Mock test.

Books (Recommended)

- | | | | |
|----|----------------------------------|---|------------------|
| 1. | Animal Physiology & Biochemistry | - | H.R. Singh |
| 2. | Animal Physiology & Biochemistry | - | VasantikaKashyap |
| 3. | Human Physiology (Vol.-I, II) | - | C.C. Chatterjee |
| 4. | Animal Physiology | - | M.P. Arora |
| 5. | Medical Physiology | - | Guyton and Hall |
| 6. | Medical Physiology | - | Ganong |
| 7. | Animal Physiology | - | Goyal andShastri |

BSC SEM-III

COURSE CODE:18.120

B.Sc. Part-II Semester-III

Program-Zoology

Course-Practical

Objective- Study and experiments related to three courses of its program.

Learning outcomes- Students who successfully completed this course will be able to-

1. Identify the specimen of different lower chordates.
2. Handle laboratory microscope and other equipments like BP apparatus.
3. Get knowledge about the instruments and slide preparation.
4. Test the blood group types, haemin crystals and its significance.
5. Prepare the permanent slides of given material.
6. Maintain records of experiments learned in the laboratory.

Assessment

1. Oral test and revisions.
2. Assessment on the basis of records maintained related to above course.
3. Mock test for spotting
4. Practical exam at the end of semester

Books (Recommended)

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|---------------------------------|---|----------------|
| 1. Practical Zoology (Vol.-II) | - | Yadav-Varshney |
| 2. Practical Zoology-Chordate | - | P.S. Verma |
| 3. Practical Zoology-Vertebrate | - | S.S. Lal |

BSC SEM-IV P-I

COURSE CODE:18.130

B.Sc. Part-II Semester-IV

Program-Zoology

Course-I Animal Diversity-IV (Chordata-II)

Amphibia to Mammalia

Objective- Brief Introduction of structural and functional morphology of different major classes of Vertebrates (Amphibia, Reptilia, Aves and Mammalia) and their taxonomic position in animal kingdom.

Learning Outcomes- After learning this course the students will be able to-

1. Explain external feature, structural organization and functional morphology of superclass: tetrapoda
2. Understand the basis of taxonomic position of classes Amphibia to Mammalia
3. Know the affinities between Prototheria, Metatheria and Eutheria
4. Describe the fundamental difference among tetrapods living on land, water and air to understand its structure and function
5. Compare the different organs in higher classes of Chordates
6. Get clear concept about parental care, neoteny or paedomorphosis

Assessment

1. One theory exam related to above course.
2. Few exercises related to above course in practical exam.
3. Mock test.

Books (Recommended)

- | | | | |
|-----|---------------------------|---|------------------|
| 6. | Text Book of Vertebrate | - | R.L. Kotpal |
| 7. | Biology of Chordates | - | H.C. Nigam |
| 8. | Vertebrate Zoology | - | Jordon & Verma |
| 9. | Chordate Zoology | - | P.S. Verma |
| 10. | A Text Book of Zoology-II | - | Parker & Haswell |

BSC SEM-IV P-II

COURSE CODE:18.140

B.Sc. II Semester-IV

Program-Zoology

Course-II Developmental Biology

Objective- Description of fate, development of zygote and its connection with mother

Learningoutcomes-After learning this course the students will be well known to

1. Segmentation,different planes and organizational patterns of egg
2. Blastulae which represent an association of presumptive organ forming areas
3. Displacement of germ layer, foetal membrane which provide adequate nutrition and protection to the developing embryo
4. Types and pattern of implantation of embryo
5. Differentiation and development of embryonic structures

Assessment

1. One theory exam related to above course.
2. Few exercises related to above course in practical exam.
3. Mock test.

Books Recommended

- | | | | |
|----|-------------------------------------|---|------------------|
| 5. | Chordate Embryology | - | P.S. Verma |
| 6. | Chordate Embryology | - | Veer BalaRastogi |
| 7. | Developmental Biology of Vertebrate | - | S.P. Mishra |
| 8. | Embryology | - | P.C. Jain |

BSC SEM-IV P-III

COURSE CODE:18.150

B.Sc. Part II Semester IV

Program - Zoology

Course III - Mammalian Physiology II

Objective : This course cover the basic idea of removal of metabolic wastes and structure and function of neuron and muscles.

Learning out comes-Students who successfully completed this course will be able to-

1. Describe pulmonary ventilation, exchange of gases and haemoglobin structure.
2. Removal of nitrogenous waste from body.
3. Describe membrane potential and nerve conduction and how the nervous system, controls the body part.
4. Describe muscle types and mechanism of contraction.
5. Describe conversion of chemical energy to kinetic energy.
6. Get knowledge about the medical field too.

Assessment

1. One theory exam related to above course.
2. Few exercises related to above course in practical exam.
3. Mock test.

Books (Recommended)

- | | | |
|-------------------------------------|---|------------------|
| 1. Animal Physiology & Biochemistry | - | H.R. Singh |
| 2. Animal Physiology & Biochemistry | - | VasantikaKashyap |
| 3. Human Physiology (Vol.-I, II) | - | C.C. Chatterjee |
| 4. Animal Physiology | - | M.P. Arora |
| 5. Medical Physiology | - | Guyton and Hall |
| 6. Medical Physiology | - | Ganong |
| 7. Animal Physiology | - | Shastri&Goyal |

BSC SEM-IV

COURSE CODE:18.160

B.Sc. Part-II Semester-IV

Program- Zoology

Course- Practical

Objective-Study and experiment related to the three course material

Learning outcomes- Students who successfully completed this course will be able to-

1. Identify the specimen of different higher Chordates.
2. Get knowledge about the articulated and disarticulated bones of frog and rabbit
3. Understand the chick development through series of permanent slides of different hours
4. Know the histological details of important organs with the help of permanent slides.
5. Prepare the temporary slides for Nissle's granules to identify nerve cells and chromatophore to study pigmentation in frog skin.
6. Maintain records of experiments learn in the laboratory.

Assessment

1. Oral test and revisions.
2. Assessment on the basis of records maintained related to above course.
3. Mock test for spotting
4. Practical exam at the end of semester

Books (Recommended)

- | | | |
|---------------------------------|---|----------------|
| 1. Practical Zoology (Vol.-II) | - | Yadav-Varshney |
| 2. Practical Zoology-Chordate | - | P.S. Verma |
| 3. Practical Zoology-Vertebrate | - | S.S. Lal |

BSC SEM-V P-I

COURSE CODE:18.170

B.Sc. Part III Semester V

Program - Zoology

Course I - Environmental Biology I

Objective : Study of interaction among organism, population, ecosystem and the biosphere. .

Learning out come-Students who successfully completed this course will be able to-

1. Understand obligatory relationship, interdependence and causal relationship of ecosystem.
2. Interpret a wide range of scientific literature in biology, ecology & environmental biology particularly dealing with both climate & global change.
3. Know about various characteristic & regulation of population.
4. Understand qualitative & quantitative nature of nutrient cycle in natural ecosystem.
5. Explain Impact of anthropological activity on biogeochemical cycle.

Assessment

1. One theory exam related to above course.
2. Few exercises related to above course in practical exam.
3. Mock test.

Books recommended

- | | | | |
|----|---------------------------------|---|-------------|
| 1. | Ecology & Environment | - | P.D. Sharma |
| 2. | Evolution & Environment Biology | - | H.C. Nigam |
| 3. | Environmental Biology | - | P.S. Verma |
| 4. | Fundamentals of Ecology | - | Eugene Odum |
| 5. | Ecology and Environment Biol. | - | H.R. Singh |

BSC SEM-V P-II

COURSE CODE:18.180

B.Sc. Part-III Semester-V

Program- Zoology

Course-II Immunology& Molecular Biology of Prokaryotes

Objective-Various ways of immune system to maintain our health and role of DNA in cell physiology

Learning outcomes- Students who successfully completed this course will be able to-

1. Understand about the possible routes of pathogen entry in our body and Compare the 1st& 2nd line of defence and its mechanical actions
2. Know the primary and secondary lymphoid organs and related cells
3. Describe the specificity of antigen-antibody interactions
4. Be aware about the types of vaccines (immunisation) against infectious diseases
5. Understand DNA repair, replication, transcription and translation
6. Describe the level of gene expression and its regulation

Assessment

1. One theory exam related to above course.
2. Few exercises related to above course in practical exam.
3. Mock test.

Books (Recommended Books)

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|-------------------------------|---|------------|
| 1. Immunology | - | Kuby |
| 2. Biotechnol. and Immunology | - | P.K. Gupta |
| 3. Biology & Cytogenetic | - | H.C. Nigam |
| 4. Molecular Cell Biology | - | P.K. Gupta |
| 5. Molecular Cell Biology | - | B. Alberts |
| 6. Molecular Cell Biology | - | Karp |

BSC SEM-V P-III

COURSE CODE:18.190

B.Sc.III Semester V

Course-III Biotechnology

Objectives: Introduction of modified genes & their applications in animals

Learning outcomes- Students who successfully completed this course will be able to-

1. Explain how genes are manipulated for large scale production.
2. Describe different types of enzymes which help in cutting & joining the genes.
3. Explain how cDNA will be formed by using mRNA.
4. Explain the isolation & transfer of recombinant genes into other organisms.
5. Describe applications of genetic engineering in pharmaceutical industries.
6. Explain how to improve genetic features of domestic animals.

Assessment

1. One theory exam related to above course.
2. Few exercises related to above course in practical exam.
3. Mock test.

Books (Recommended Books)

1. Biotechnology - B.D. Singh
2. Biotechnology - P.K. Gupta
3. Biotechnology and Immunol. - P.K. Gupta

BSC SEM-V P-IV

COURSE CODE:18.200

B.Sc. III Semester -V

Program-Zoology

Course-IV Applied Zoology

Objective- An important aspect of applied zoology is not only disease of harmful species but also their control and prophylaxis of these animals.

Learning outcomes:Students who successfully completed this course will be able to-

1. Develop advance knowledge to understanding relevant applied zoology .
2. Aware about various harmful effect of insect and their economic importance.
3. Develop skill in observing and recording animal behavior.
4. Understand the concept of the different harmful organism an their life cycle .
5. Develop advance knowledge about common diseases, reasons, symptoms, prophylaxis's and t their control and treatment .

Assessment

1. One theory exam related to above course.
2. Few exercises related to above course in practical exam.
3. Mock test.

Books (Recommended Books)

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|----|-------------------------------|---|-----------------|
| 1. | Economic Zoology | - | Shukla&Upadhyay |
| 2. | Economic Zoology | - | Ahsan&Sinha |
| 3. | Applied Entomology | - | P.G. Fenemore |
| 4. | Applied and Economic Zoology- | | ParulYadav |

BSC SEM-V

COURSE CODE:18.210

B.Sc. Part-III

Semester-V

Program-Zoology

Course-Practical

Objective- Study and experiments related to all four courses of its program.

Learning outcomes-Students who successfully completed this course will be able to-

1. Estimate the alkalinity, dissolved oxygen and carbon dioxide of different water samples.
2. Uses of different instruments required for measurement of humidity, minimum and maximum temperature and atmospheric pressure.
3. Observe and identify different types of harmful species of animals.
4. Understand uses of incubator, autoclave, centrifuge, Laminar air flow and electrophoresis
5. Describe DNA replication, DNA helical structure, linking of nucleotide DNA, reverse transcriptase through model studies.
6. Maintain records of experiments learn in lab.

Assessment

1. Oral test and revisions.
2. Assessment on the basis of records maintained related to above course.
3. Mock test for spotting
4. Practical exam at the end of semester

Books (Recommended)

- | | | |
|-------------------------------|---|-----------------------------|
| 1. Practical Zoology (Vol.-3) | - | Yadav-Varshney |
| 2. Advanced Practical Zoology | - | P.S. Verma& P.C. Srivastava |
| 3. Practical Zoology (Vol.-3) | - | S.S. Lal |

BSC SEM-VI P-I

COURSE CODE:18.220

B.Sc. Part III Semester VI

Program Zoology

Course I Environmental Biology II

Objective : Introduce the student to various regional & global concerns regarding the environment, including the natural challenges, various type of environmental pollution, natural resources & wild life conservation.

Learning outcomes-Students who successfully completed this course will be able to-

1. Describe the impact of woman activities on their life and environment.
2. Learn about the significance of native biodiversity and need for their conservation.
3. Investigate specific cases of environmental pollution or natural challenges & their impact.
4. Show awareness of scientific concern and the ethical and social issues associated with some of the environment problem.
5. Known about importance of water harvesting.
6. Demonstrate critical thinking skill in relation to environment affair.

Assessment

1. One theory exam related to above course.
2. Few exercises related to above course in practical exam.
3. Mock test.

Books (Recommended)

1. Ecology & Environment - P.D. Sharma
2. Evolution & Environment Biology - H.C. Nigam
3. Environmental Biology - P.S. Verma
4. Fundamentals of Ecology - Eugene Odum

BSC SEM-VI P-II

COURSE CODE:18.230

B.Sc. III Semester-VI

Program- Zoology

Course-II Biochemistry

Objective-Bimolecular study in the living system.

Learning outcome- Students who successfully completed this course will be able to-

1. Describe importance of pH , buffer in the living system .how it work to maintain the homeostasis of the body.
2. Describe the importance of thermodynamic principle in the living system.
3. Know about structure and function of carbohydrate, protein and lipid.
4. Understand the biological significance of macromolecules.
5. Understand about enzymes and their catalyzed reactions
6. Explain the kinetics of enzyme actions

Assessment

1. One theory exam related to above course.
2. Few exercises related to above course in practical exam.
3. Mock test.

Books (Recommended)

1. Fundamental of Biochemistry - J.L. Jain
2. Animal Physiology & Biochemistry - R.A.Agrawal
3. Animal.AnimalPhysiology & Biochemistry - H.R.Singh
4. Biochemistry - Lehninger
5. Harper's Biochemistry - Harper (W.Rodwell,
P. Anthony)

BSC SEM-VI P-III

COURSE CODE:18.240

B.Sc. III Semester-VI

Program- Zoology

Course-III: Endocrinology

Objective- This course cover the endocrine system , hormones including their classification functions and mechanism of action.

Learning outcome- Students who successfully completed this course will be able to-

1. Define the term hormone and explain its general characteristics.
2. Distinguish between endocrine glands and an exocrine gland.
3. Describe hypothalamic –hypophysial complex to understand secretion and function of hormones in normal and stress condition.
4. Describe how glucose levels are maintained in the blood.
5. Describe clinical manifestation of conditions resulting from hyper and hypo secretion of each endocrine gland.
6. Understand the histopathological appearance of some diseases of the endocrine gland.

Assessment

1. One theory exam related to above course.
2. Few exercises related to above course in practical exam.
3. Mock test.

Books (Recommended)

- | | | | |
|----|--------------------|---|-----------------|
| 1. | Human Physiology | - | C.C. Chatterjee |
| 2. | Medical Physiology | - | Guyton and Hall |
| 3. | Animal Physiology | - | Goyal&Sastry |
| 4. | Medical Physiology | - | Ganong |

BSC SEM-VI P-IV

COURSE CODE:18.250

B.Sc. III Semester-VI

Program- Zoology

Course-IV: Applied Zoology

Objective-An important aspect of applied zoology is not only control of various harmful species but also the conservation and management of beneficial insect.

Learning outcome- Students who successfully completed this course will be able to-

1. Develop advance knowledge to understand relevant applied zoology.
2. To understand the concept of different economically important insect life cycle.
3. The awareness about various about beneficial insects and its economic and medicinal importance.
4. To understand the various Indians breed and their distribution and characteristics of fish.
5. Develop skill in observing and recording animal behavior.
6. Understand the various diseases and control the beneficial.

Assessment

1. One theory exam related to above course.
2. Few exercises related to above course in practical exam.
3. Mock test.

Books (Recommended)

1. Economic Zoology - Shukla&Upadhyay
2. Economic Zoology - Ahsan&Sinha
3. Applied Entomology - P.G. Fenemore
4. Applied and Economic Zoology- ParulYadav

BSC SEM-VI

COURSE CODE:18.260

B.Sc. Part-III

Semester-VI

Program-Zoology

Course-Practical

Objective- Study and experiments related to all four courses of its program.

Learning outcomes-Students who successfully completed this course will be able to-

1. Detect the carbohydrate, protein and lipids in different samples.
2. Handle insecticidal machine, hand rotary and knap sack sprayer.
3. Observe and identify different types of beneficial animals.
4. Dissect the albino rat for identification of different endocrine glands.
5. Describe the histology of different endocrine glands with the help of prepared slides.
6. Maintain records of experiments learn in lab.

Assessment

7. 1. Oral test and revisions.
8. 2. Assessment on the basis of records maintained related to above course.
9. 3. Mock test for spotting
- 10.4. Practical exam at the end of semester

Books (Recommended)

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|-------------------------------|---|-----------------------------|
| 1. Practical Zoology (Vol.-3) | - | Yadav-Varshney |
| 2. Advanced Practical Zoology | - | P.S. Verma& P.C. Srivastava |
| 3. Practical Zoology (Vol.-3) | - | S.S. Lal |