EWING CHRISTIAN COLLEGE
ALLAHABAD

(An Autonomous Constituent College of Allahabad University)

DEPARTMENT OF ZOOLOGY

Lecture List of B.Sc. Part I

2015-2016

SEMESTER-I

PAPER-I
(MICROSCOPY, CELL BIOLOGY, PROTOZOA AND PORIFERA)

UNIT- I

Microscopy :

1. Principles of Microscopy
   - (i) Magnification
   - (ii) Resolving Power
2. Light Microscopes :
   - (i) Simple Microscope.
   - (ii) Compound Microscope.
   - (iii) Binocular Microscope.
   - (iv) Phase contrast Microscope.
3. Election Microscope (E.M.) :
   - (i) Principles of Electron Microscopy.
   - (ii) Working of :
     - (a) Transmission Electron Microscope (TEM)
     - (b) Scanning Electron Microscope (SEM)

Unit-II

Cell Biology :

1. Structure of Plasma Membrane (Fluid Mosaic Model), Passive and Active Transport across the Membrane. ($Na^+ - K^+$ pump)

2. Structure and functions of :
   (i) Golgi Apparatus
   (ii) Endoplasmic Reticulum
   (iii) Ribosomes
   (iv) Lysosomes
   (v) Mitochondria
3. Cytoskeletal structures : Cilia and Flagella
4. Structure and functions of Nucleus, Nuclear membrane, Nucleolus and Nuclear pore complex.
5. Structure of eukaryotic chromosome (Nucleosome).
6. Polytene and Lampbrush chromosomes.

Unit-III

Phylum : Protozoa :

1. General characters and Classification upto orders with examples
2. Type study :
   (a) Parasitic Protozoan : *Leishmania*.
      (i) Morphology,
      (ii) Life cycle, pathogenesis, therapy and prophylaxis
   (b) Free living protozoa : *Euglena*.

Unit-IV

Phylum Porifera :

1. General characters and Classification upto orders with examples.
2. Type study :
   Sycon
   (i) Morphology,
   (ii) Life cycle
3. Canal system in Porifera.

PAPER II

(CTENOPHORA, COELENTERATA, PLATYHELMINTHES, ASCHELMINTHES AND ANNELIDA)

UNIT I

Phylum : Ctenophora :

1. General characters and Classification upto orders with examples.
2. Comparison with Coelenterate and its position in Animal Kingdom.
3. Type study—

   Pleurobrachia (External features only).

Phylum : Coelenterata :

1. General characters and Classification upto orders with examples.
2. Type Study :

   Obelia, Alternation of generation in *Obelia*

UNIT II

Phylum : Platyhelminthes :

1. General characters and Classification upto orders with examples.
2. Type study :

(a) Planaria (Dugesia) :

(i) Morphology

(ii) Regeneration. Heteromorph

(iii) Asexual and sexual reproduction & development

(b) Echinococcus :

(i) Morphology

(ii) Reproduction, life history and development

Unit III

Phylum : Aschelminthes :

1. General characters and Classification upto orders with examples.
2. Type study :

Ancylostoma.

(i) Morphology

(ii) Reproduction, life history and development

UNIT IV

Phylum : Annelida :

1. General characters and Classification upto orders with examples.
2. Type Study :

Hirudinaria (Indian Cattle Leech)

(i) Morphology, body wall, locomotion.

(ii) Alimentary canal, feeding and digestion.

(iii) Haemocoelomic system, course of circulation.

(iv) Rspiration

(v) Excretory system

(vi) Nervous system, Sense organs and receptors organs.

(vii) Reproductive system.

PRACTICAL (Based on theory syllabus)

SEMESTER-I

1. Microscopy

- Study of different types of microscopes.

2. Cell Biology

- Problems on Cell Biology
- ❖ Slide preparation
- Giant Chromosomes
- Eukaryotic Chromosomes
- Mitochondria
- Golgi bodies

3. Protozoa

- Study of Prepared slides
- ❖ Mounting

4. Porifera

- Study of Museum specimens and Prepared slides
- ❖ Mounting

5. Ctenophora

- Study of Museum specimens and Prepared slides

6. Coielenterate

- Study of Museum specimens and Prepared slides
- ❖ Mounting

7. Platyhelminthes

- Study of Museum specimens and Prepared slides

8. Aschelminthes

- Study of Museum specimens and Prepared slides

9. Annelida

- Study of Museum specimens and Prepared slides
- Mounting
- Dissection (Pheretima)

Record

10. Rehearsal followed by final practical examination.

SEMESTER–II

Paper I

(ONYCHOPHORA, ARTHROPODA, MOLLUSCA AND ECHINODERMATA)

UNIT I

Phylum : Onychophora :

1. General characters and affinities of Peripatus

UNIT II

Phylum : Arthropoda :

1. General characters and Classification upto orders with examples
2. Type study :
   (a) *Apis* (Honey Bee) :
      (i) Morphology
      (ii) Different castes in honey bees.
      (iii) Reproduction
      (iv) Economic importance
   (b) *Palaemon* (Prawn) :
      (i) External features
      (ii) Appendages

UNIT III

Phylum : Mollusca :

1. General characters and Classification upto orders with examples.
2. Type Study :

   (Pila globosa) : Apple snail

   (i) External features, pallium organ of pallial complex.

   (ii) Digestive system

   (iii) Respiratory system

   (iv) Circulatory system

   (v) Excretory system

   (vi) Nervous system

   (vii) Sense Organs

   (viii) Reproductive system.

   (ix) Torsion & detorsion

UNIT IV

Phylum – Echinodermata :

1. General characters and Classification upto orders with examples.
2. Type study :

Asterias (Star fish) :

(i) External Morphology.

(ii) Water vascular system.

(iii) Digestive system, Circulatory system, Skeletal system and Reproductive system.

(iv) Development and larval forms.

SEMESTER-II

Paper II

(GENETICS, EVOLUTION & ANIMAL DISTRIBUTION)

UNIT I

Genetics A

1. DNA and RNA structure
2. Evidence that nucleic acids are the genetic material :
   (i) Transformation in *Pneumococcus*
   (ii) Hershey-Chase experiment
   (iii) RNA as genetic material in small viruses
3. Semi conservative mode of DNA replication : Meselson & Staahl's experiment.
4. Genetic code
5. Transcription, post transcriptional changes in mRNA and translation.
6. Molecular basis of mutation : Transition, Transversion & Frame shift mutation.

Unit II

Genetics B

1. Sex determination in Drosophila and Man.
2. Sex chromatin bodies, dosage compensation and Lyon's hypothesis.
3. Sex chromosomal abnormalities : Turner, Kleinfelter's syndrome and Down Syndrome.
4. Blood groups : A, B, AB and O & Genetics of A, B, AB & O blood groups.

UNIT III

Evolution :

1. Mutation
2. Variation
3. Isolation & Speciation
4. Modern synthetic theory of evolution

UNIT IV

Animal Distribution

1. Geological and geographical distribution of animals
2. Wallace line, Weber line, Galapagos Island, Continental drift
3. Importance of animal fossils, their nature and age.
4. Factors influencing large scale and animal distribution, dispersal and barriers.

Practical (Based on theory syllabus)

1. **Onychophora**
2. **Anthropoda**
   - ● Study of Musuem specimens and Prepared slides
   - ❖ Mounting
   - ◘ Dissection (*Palaemon*)
3. **Mollusca**
   - ● Study of Museum specimens and Prepared sides
   - ❖ Mounting
   - ◘ Dissection (*Unio* & *Pila*)

4. **Echinodermata**

   - Study of Museum specimens and Prepared slides

5. **Genetics**

   - Blood groups
   - Sex chromatin body
   - Problems on Genetics

6. **Record**

7. **Rehearsal** followed by final Practical Examination.

■ ■

EWING CHRISTIAN COLLEGE
ALLAHABAD

(An Autonomous Constituent College of Allahabad University)

DEPARTMENT OF ZOOLOGY

Lecture List of B.Sc. Part II

2015-2016

SEMESTER-III

Paper – I

(HEMICHORDATA, PROTOCHORDATES & SPECIAL TOPICS)

UNIT I

Hemichordata :

1. General characters & classification of Hemichordata upto orders :
2. Types study :

   Balanoglossus

   i. Morphology
   ii. Circulatory
   iii. Digestive
   iv. Tornaria larva
   v. Affinities

UNIT II

Protochordates–A

1. Type study :

   Herdmania

   i. Morphology
   ii. Circulatory system

iii. Digestive organs
iv. Reproductive organs
v. Tadpole larva
vi. Retrogressive metamorphosis

1.

2.

UNIT III

Protochordates–B

1. **Type study :**
   Branchiostoma (*Amphioxus*)
   i. Morphology
   ii. Circulatory system
   iii. Digestive system
   iv. Primitive, degenerate and specialized characters

UNIT IV

Special Topics :

1. Biting mechanism in poisonous snakes.
2. Flight adaptations in birds.
3. *Sphenodon* as living fossil.

Paper-II

(ETHOLOGY, ECOLOGY)

UNIT I

Ethology A

1. Introduction and concept of Animal behaviour.
2. Different methods and techniques of studying anim behaviour.
   (a) Innate Behaviour :
   (i) Kinesis
   (ii) Taxes

SEMESTER-IV

Paper I

(PHYSIOLOGY & BIOCHEMISTRY)

UNIT I

Physiology (Human) : A

1. **Digestion :**
   - (i) Digestion of food in mouth, stomach and small intestine.
   - (ii) Absorption and assimilation of digested nutrients in the body.
2. **Respiration :**
   - (i) Structure of lungs and air passage.
   - (ii) Mechanism of breathing.
   - (iii) Transport of oxygen and carbon dioxide in the body.
3. **Circulatory System :**
   - (i) Outline study of internal structure.
   - (ii) Heart beat and E.C.G.
   - (iii) Blood clotting
4. **Excretion :**
   - (i) Structure of kidney.
   - (ii) Structure and functions of Uriniferous tubules.
   - (iii) Mechanism of urine formation (Counter current theory)

UNIT II

Physiology (Human) : B

1. **Musculature :**
   - (i) Study of different types of muscles and their functions.
   - (ii) Mechanism of muscle contraction and Sliding filament theory of muscle contraction.

2. Nervous System :

(i) Structure of different types of Neurons.

(ii) Conduction of nerve impulse across the axon and synapse.

(iii) Reflex action.

3. Reproductive System :

(i) Sexual reproduction in man

(ii) Reproductive organs

(iii) Menstrual cycle

(iv) Sex Hormones

(v) Fertilization

(vi) Pregnancy

(vii) Parturition

(viii) Lactation

4. Endocrine System :

(i) Different kinds of endocrine glands and their secretions and functions.

(ii) History of Pituitary, Thyroid, Parathyroid and Sex glands.

(iii) Mechanism of Hormone action.

UNIT III

Biochemistry : A

1. Characteristics, classification, structure, nature and biological significance of : Proteins, Carbohydrates and Lipids.
2. Classification, importance and sources of Vitamins.

UNIT IV

Biochemistry : B

1. Characteristics, classification, structure, nature of Enzymes and Co-enzymes.
2. Metabolism :
   (i) Glycolysis,
   (ii) Kreb's cycle
   (iii) Oxidative Phosphorylation
   (iv) Gluconeogenesis
   (v) Cori's cycle
   (vi) Urea cycle

Paper II

(CLASSIFICATION OF VERTEBRATES & COMPARATIVE ANATOMY)

UNIT I

Classification of Vertebrates

1. General characters and classification of AGNATHA and GNATHOSTOMATA upto orders with examples.
2. Comparative morphology and anatomy of *Scoliodon, Rana tigrina, Varanus, Columba* and *Lepus*, with references to the following systems :
   1. Integumentary system :
      (i) Structure & functions of skin,
      (ii) Comparative study of Integument.
      — Structure & development of placoid scale.
      — Structure, classification and development of feathers.
      — Structure & development of hair.

UNIT II

1. Digestive system,
   (i) Structure of alimentary canal
   (ii) Glands
2. Circulatory system

UNIT III

1. Respiratory system
2. Urinogenital system
   (i) Origin of gonads
   (ii) Development of Pro-, meso - & metanephros.

UNIT IV

1. Nervous system :
   (i) Definition & Classification.
   (ii) Development of Central Nervous System.
   (iii) Development, Structure & Comparision of Spinal Cord of Fish, Frog, Reptile, Bird and Mammal.
   (iv) Differentiation of Brain.
   (v) Comparative study of Brain of *Scoliodon, Rana, Varanus, Columba* & *Lepas.*
2. Skeletal system :
   (i) Development of skill and vertebral coloun,
   (ii) Jaw suspension.

PRACTICAL

1. **Dissection / VIVA**

   (*Scoliodon*, Frog, *Columba*, Rat)

2. **Mounting :**

   Related to dissection :

   (a) Placoid Scales

   (b) Ampulla of Lorenzini

   (c) Striped and Unstriped muscles

   (d) Blood film of frog (Double staining)

3. **Spotting :**

   Museum specimens, slides and osteology of vertebrates.

4. **Physiology :**

   (a) Study of Human blood-leucocytes.

   (b) Haemolysis-Effect of isotonic, hypotonic and hypertonic solution on Erythrocytes.

   (c) Preparation of Haemin crystal. (Goat's blood)

   (d) Demonstration of simple muscle twitch in gastronemus muscle, Sciatic nerve preparation of frog including it's recording.

   (e) Study of sections of pituitary, thyroid, adrenal, pancreas, testes and ovary from prepared slides.

   (f) To find out the Haemoglobin percentage (Hb%) in one's own blood.

5. **Biochemistry :**

   (a) Biochemical tests for identification of carbohydrates, lipids and proteins.

   (b) Action of salivary amylase, pepsin and trypsin.

   (c) Effect of pH and temperature on the enzymatic action of salivary amylase.

6. **Practical Record**

7. **Continuous Assessment (Marks to be added in Annual Examinations)**

EWING CHRISTIAN COLLEGE
ALLAHABAD
(An Autonomous Constituent College of Allahabad University)
DEPARTMENT OF ZOOLOGY
Lecture List of B.Sc. Part III
2015-2016

ZOOLOGY SYLLABUS

Paper I	Molecular Biology, Immunology & Bioinformatics Microbiology & Biotechnology
Paper II	Medical Zoology & Economic Entomology Poultry, Pisciculture & Biostatistics
Paper III	Instrumentation & Developmental Biology Environmental Biology & Toxicology

Paper - I
(Molecular Biology, Immunology, Bioinformatics, Microbiology & Biotechnology)

Molecular Biology

1. Eukaryotic genome organization : Unique and repetitive DNA sequences and Renaturation kinetics.
2. Recombination and chromosome mapping in bacteria and virus : transformation, transduction and conjugation.
3. Somatic cell Hybridization : Heterokaryons, synkaryon, & Cell hybrids, somatic cell genetics with reference to retina blastoma, gene expression in somatic cell hybridization.
4. Transposons in prokaryotes : Is element and eukaryotes copia like element, Ty element, IAP, FB, TE, Ac/Ds, Spm/ dspm elements and retroposons.

Immunology :

1. Brief history
2. Principles.

3. Immunity, types of immunity.
4. Components of immune system
5. Humoral & cell mediated immune response.
6. Antigens and antibodies
7. Types of immunoglobulin, physical and chemical properties of immunoglobulin.
8. Major Histocompatibility Complex (MHC), Transplantation antigens

Bioinformatics :

1. Introduction and scope of Bioinformatics.

Microbiology :

1. Introduction and scope of Microbiology.
2. Classification of micro-organisms.
3. Microbial morphology and physiology.
4. Nutrition, cultivation, growth and sterilization of micro-organisms.
5. Industrial, food and medical microbiology.
6. Environmental microbiology.

Biotechnology :

1. Scope, importance and application of Biotechnology.
2. Tools of Genetic Engineering :
   (a) Enzymes with examples : Exonucleases, restriction endonucleases, ligase.
   (b) Cloning vectors : Plasmids, bacteriophages, insertion and expression vectors, cosmids, phasmids.
3. Techniques of Genetic Engineering : In-vitro synthesis of recombinant DNA and gene cloning techniques, PCR techniques. Microinjection of DNA into fertilized eggs.
4. Nucleotide sequencing : Maxam - Gilbert and Sanger's techniques.
5. Southern blot technique, c-DNA probes, Biosensors, Biochips.

PRACTICALS

Molecular Biology

1. Problems from Genetics.
2. DNA and RNA localization
3. Karyotypes
4. Construction of models

Immunology :

1. Antigen - Antibody complexes
2. Blood Groups (In-vitro cross reactions).
3. Total & Differential Leucocyte Count (TLC, DLC).
4. B-Lymphocytes and T-Lymphocytes
5. Macrophages-study of prepared slides.
6. Serum Electrophoresis for r-globulins.
7. Immunodiffusion :
   (a) Ouchterlony double diffussion
   (b) Radial diffusion.

Microbiology :

1. Preparation of culture media and its sterilization.
2. Staining of bacteria : Simple and Gram's Staining.
3. Isolation and bacteria counts from water, soil samples.
4. Culture & sensitivity of pathogenic bacteria from urine sample.

Biotechnology :

Practical on availability of facilities.

Paper -II

(Medical Zoology, Economic Entomology, Poultry, Pisciculture & Biostatistics)

Medical Zoology

1. Microorganisms : General account, characteristics of a pathogen, transmission of microbes from / to the host.
2. Protozoan parasites of man causing diseases : pathogenesis, diagnosis, prophylaxis and therapy.
3. Morphology, Life cycle, Pathogenesis, Prophylaxis and therapy of the following :

(a) Trematode parasites of man : *Fasciolopsis buski*
(b) Cestode parasites of man : *Dihyllobothrium latum*;
(c) Nematode parasites of man : *Dracunculus medinensis*

4. Parasitic adaptations in Helminthes
5. Arthropods of medical importance : General account and their classification, Specific effects caused by Arthropods - dermatosis, mylasis, allergy, annoyance, blood loss.
6. Arthropods as vectors : Diseases transmitted by Arthropods, Mechanical transmission, Biological transmission, Certain diseases transmitted by arthropods and their pathogenesis, diagnosis, treatment and control, Malaria, Yellow fever, Dengue and Plague.

Economic Entomology :

1. (a) General introduction.
   (b) Biological control
2. Study of important crop pests & their control.
   (i) Some important pests cotton and study of life cycle damage and control of Dysdercus cingulatus.
   (ii) Some important pests of sugar cane and study of life cycle, damage & control of sugar cane stem borer.
   (iii) Some important pests of paddy and study of life cycle, damage & control of paddy stem borer.
   (iv) Some important pests of vegetables and study of life cycle, damage and control to *Diacrisia obliqua* & *Spodoptera litura*.
   (v) Study of life cycle, damage and control of five stored grain pests.
      1. *Sitophilus oryzae.*
      2. *Trogoderma granarium*
      3. *Rhizopertha dominica*
      4. *Pachimerus chinensis*
      5. *Sitotroga cerealella.*
3. Sericulture
4. Apiculture.

Poultry

1. **General :** What is poultry? Present status, future and importance of poultry industry in India.
2. **Breeds, Breedings, Selection and Culling** : Study of important breeds of poultry, classification of chicken breeds, Important charactertics of chicken breed, Distinguishing features of different types of chickens, Merits and demerits of local & foreign breeds. Important characteristics of some breed of chicken. What is strain? ***Different types*** of commercial broiler and layer strain available in India, Principles of breeding poultry, Types of characters in poultry, Mating in poultry, Systems of breeding in poultry, Selection for improvement of poultry, Selection of a Breed for egg production, Breeding for Broiler Production (Quality Meat), Culling of poultry, Incubation and Hatching.
3. **Poultry Nutrition :** Principles of feeding poultry, Major nutrients in feed, Digestive system of fowl.
4. **Management of Chickens :** Brooding Managements, Growth management and layer management.
5. **Health Care and Management of Poultry diseases** (Causes, symptoms, transmission, prevention, treatment etc.) Ranikhet disease and Infectious Bursal disease.
6. **Egg Care and Management :**
   (a) Reproductive organs of fowl and formation of egg.
   (b) Egg, structure and its nutrients
   (c) Types of abnormal eggs, defects in egg, reasons for deterioration in egg quality.

Pisciculture :

1. Basic knowledge of different types of fisheries.
2. Spawning & factors influencing spawing.
3. Cultivation of indigenous carps & composite fish culture.
4. Induced breeding, Hypophysation Technique of induced breeding in major carps of India.

5. Diseases of fresh water fish and their control.
6. Economic value of fishes : fish as food and its by products.

Biostatistics :

1. Introduction : Role of Biostatistics in Biology.
2. Measurement of Central Tendencies : Methods of data collection and its treatment, definitions and calculation of :
   (a) Arithmetic Mean
   (b) Median
   (c) Mode
   (d) Range
   (e) Variance
   (f) Standard deviation
3. Graphic Inference :
   (a) Bar chart
   (b) Frequency histogram
   (c) Frequency polygon
   (d) Pie chart

PRACTICALS

Medical Zoology :

1. Study of slides of disease causing Protozoans—*Entamoeba, Leishmania, Trypanosoma, Plasmodium, Balantidium.*
2. Study of slides and specimen of parasitic helminthes including phytonematodes : *Dracunculus* adult and juvenile *Diphyllobothrlum latum, Trichniella spiralis* & phytonematodes available.
3. Preparation of slides of protozoans, parasitic helminthes extracted from the digestive tract of invertebrates & vertebrates :
   (a) Temporary
   (b) Permanent
4. Extraction of Phytonematodes from soil samples by :
   (a) Cobb's method
   (b) Baermann's funnel method

Economic Entomology :

1. Permanent mount of important stored grain pests.
2. Preparation of life cycles of at least two plant pests.
3. Whole mount of ticks of cattle, dog & fowl.
4. Study of grain/leaf destruction by pests & statistical evaluation of the data (recorded or provided).
5. Apiculture : Pemonstration of bee hive equipments, Life cycle of bee, Preparation of Sting apparatus, metathoracic leg mouth parts and wings.

Poultry, Pisciculture and Biostatistics :

1. Study of the external feature of male and female fowl.
2. Identification of feed ingredients used in poultry ration
3. Evaluation of Egg quality.
4. Study of available permanent slides.
5. Study of economically important fish.
6. Study of ecto & endo parasites infecting fresh water fish.
7. Biostatistics-Statistical problems.

Paper - III

(Instrumentation, Development Biology, Environmental Biology & Toxicology)

Instrumentation

1. pH meter
2. Electrophoresis
3. Chromatography
4. Photocolorimeter
5. PCR technology
6. Autoradiography

Development Biology

1. Definition, scope (developmental biology and human welfare) developmental biology & embryology, history of embryolog (preformation theory, theory of epigenesis, biogenetic law germplasm theory of Weismann), branches, techniques an experimental methods.

2. Asexual reproduction :
   (i) Types (fission, budding & gemmule formation) Morphogenetic processes & stages (blastogenesis & blastozoids)
   (ii) Comparison between blastogenesis &.embryogenesis.
3. Sexual reproduction :
   (i) Game togenesis (spermatogenesis & oogenesis)
   (ii) Maturation of gametes
   (iii) Vitellogenesis
   (iv) Parthenogenesis
4. Fertilization
   (i) Requirements of fertilization
   (ii) Mechanism of fertilization
   (iii) Significance of fertilization
5. Cleavage :
   (i) Planes of cleavage
   (ii) Patterns of cleavage
   (iii) Rate of cleavage
   (iv) Effect of yolk on deavage
   (v) Cleavage laws
   (vi) Fate maps .
   (vii) Differentiation
6. Development upto gastrulation :
   (i) *Amphioxus*
   (ii) Frog
   (iii) Chick
7. Metamorphosis (in insects and amphibians) :
   (i) Types, significance & hormonal regulation of Metamorphosis.
8. Regeneration :
   (i) Amphibian limb generation
   (ii) Regeneration in *Hydra*

9. Miscellanous :
   (i) Teratogenesis
   (ii) Growth concept types, degrowth
   (iii) Cell death
   (iv) Ageing

Environmental Biology :

1. Environmental pollution : Different types of pollution sources, effects and control (air, water, soil, noise).
2. Environmental monitoring.
   Purpose of monitoring.
3. Environmental degradation and it's socio-economic impact :
   (a) Natural calamities.
   (b) Harmful effects of deforestation, desertification and overgrazing.
4. Wild life management in India & its importance
5. IUCN Red list categories.

Toxicology :

1. Concept and scope of Toxicology
2. Xenobiotics :
   (a) Translocation
   (b) Absorption and
   (c) Biotransformation
3. Excretion of Toxicants

Instrumentation :

1. pH-meter
2. Electrophoresis
3. Colorimeter
4. Chromotography

PRACTICALS

Development Biology

1. Preparation of ovary and testes of some insects (Grass-hopper etc.) to study various stages of Oogenesis and Spermatogenesis.
2. Sorting and identification of parthenogenesis in a population of aphids and honeybees.
3. Study of metamorphosis : Life stages of holometabolous insects.
4. Plotting of growth curves for supplied data and interpretation of growth curve-patterns. Statistical analysis and graphic representation of data (theoritical excercise)

Environmental Biology :

1. Analysis of polluted water sample : Physical, chemical and microscopical.
2. Study of different soil samples : Physical and chemical.
3. Study of biotic components of pond ecosystem : pH, turbidity, temperature, light intensity.

General :

- Practical Records & collection
- Continuous Assessment (Marks to be added in Final Practical Examinations)