

SARDAR PATEL UNIVERSITY
FIRST YEAR B.Sc. (First Semester)
BIOLOGY (ZOOLOGY) FSBI-101
Invertebrata, Hemichordata and Applied Zoology
(EFFECTIVE FROM JUNE 2010)
(2 CREDITS, TWO PERIODS PER WEEK)
(TotalMarks-100, Internal-30marks, External-70)

UNIT 1

Outline classification and significance of classification, Major Invertebrate phyla(Protozoa to Hemichordata)

Type study of Amoeba- Systematic position, Habit & Habitat, Structure, Locomotion(Sol-gel Theory),Food,Feeding and nutrition(Ingestion methods, digestion, assimilation, diasimilation, egestion), Respiration , Excretion, Osmoregulation, Behaviour, Reproduction (Asexual methods-binary fission, multiple fission, sporulation and encystment)

Type study of Hydra- Systematic position ,Habit & Habitat, Structure-External and Internal(Histology of body wall, cells of body wall and their functions), Locomotion methods, Food, Feeding and nutrition(Ingestion , digestion, egestion), Respiration , Excretion, Osmoregulation, Nervous system, Reproduction (Asexual and sexual, Fertilization, Development, Regeneration(Excluding Behaviour)

UNIT 2

Study of Parasites-Filaria, Taenia solium and Plasmodium(External structure, lifecycle, pathogenicity, symptoms, prevention and drugs)

Type study of Earthworm- Systematic position ,Habit & Habitat, External Structure, Body wall and its functions), Coelom-composition and function, Digestive system, Food and Feeding mechanism, Physiology of digestion, Excretory system-types of nephridia, structure, Physiology of Excretion, Nervous system-central, peripheral and sympathetic, Sense organs-Epidermal receptors, buccal and photoreceptors, Reproductive system-male and female, copulation, cocoon formation and development (Excluding circulatory system)

UNIT 3

Type study of cockroach- Systematic position ,Habit & Habitat, External Structure, Segmentation-Head, mouth parts, thorax, walking legs, wings, abdomen, Body wall and its functions, Body cavity, Fat body-cells and function, Digestive system, Food and Feeding mechanism, Physiology of digestion, Digestive glands, Blood vascular system-Haemocoel, heart, haemolymph, circulation of blood, Respiratory system-spiracle and types, trachea, mechanism of respiration, Excretory system-types of excretory organs, structure of malphigian tubules, Physiology of Excretion, Nervous system-central, peripheral and sympathetic, Receptor organs-sensillae and photoreceptor organ, working of compound eye, Reproductive system-male and female, copulation, ootheca formation and development (Excluding endoskeleton and locomotion)

Metamorphosis in Insects-Definition, Types-(Ametabolous, hemimetabolous, holometabolous, gradual metamorphosis), Hormonal control of metamorphosis in brief

UNIT 4

Pearl culture-Composition, pearl producing molluscs, formation of pearls

Economic importance of Mollusca

Water vascular system in Echinoderms-Composition and working mechanism

Type study of Balanoglossus-Systematic position, Habit & Habitat, External Structure, body wall, coelom, Digestive system, food, feeding and digestion, Respiratory system and mechanism of respiration, Excretory system, Nervous system, Sense organs, Reproductive system, Fertilization and development, pre-larval development, larval development, tornaria larva, metamorphosis, Asexual reproduction (Excluding endoskeleton & Blood vascular system)

LIST OF REFERENCE BOOKS

- 1) Modern Textbook of Zoology (Invertebrates)- R.L. Kotpal
- 2) Textbook of Invertebrate Zoology Vol-I & II –G.S. Sandhu, H. Bhaskar
- 3) Invertebrate Zoology- Jordan and Verma
- 4) Biology of Animals(Invertebrate)- Ganguly, Sinha and Adhikari (Vol I & II)
- 5) Medical Parasitology -Dey & Dey
- 6) Economic Zoology-Shukla and Upadhyay
- 7) Handbook of Economic Zoology-Jawaid Ahsan, Subhash Prasad Sinha
- 8) Invertebrate Zoology by R.D. Barnes: W.B. Sauwonders

SARDAR PATEL UNIVERSITY
FIRST YEAR B. Sc. (First Semester)
BIOLOGY (BOTANY) FEBI-102
Plant Cytology and Taxonomy
(Effective from June 2010)
(2 CREDITS, TWO PERIODS PER WEEK)
(Total Marks-100, Internal-30 marks, External-70 marks)

Unit-1

- ◆ Viruses : History, Properties, Structure and symmetry, Lytic and Lysogenic cycle Bacteriophage, TMV
- ◆ Prokaryotic cell – Ultra structure of Bacterial cell, Morphological types of Bacteria, Vegetative, Asexual and Sexual (Transformation, conjugation and Transduction) reproduction in brief

Unit-2

- ◆ Eukaryotic Cell : Ultrastructure of eukaryotic cell.
- ◆ Ultrastructure and functions of Cell organelles: Cell wall, Plasma membrane, Mitochondria, Chloroplast, Endoplasmic Reticulum, Golgi Complex, Lysosomes and Ribosomes.
- ◆ Cell Division: Mitosis and its significance.

Unit-3

- ◆ Plant Morphology
- ◆ Phyllotaxy and its types – Alternate, Opposite and Whorled
- ◆ Leaf Morphology – Parts of simple leaf
- ◆ Compound leaf and its types – Pinnate compound and Palmate compound
- ◆ Inflorescence ;
Racemose : Raceme, Spike, Catkin, Spadix, Corymb, Umbel, Capitulum
Cymose: Monochasial, Dichasial and Polychasial
Special types: Verticillaster, Hypanthodium, Cyathium
Solitary: Terminal and Axillary
- ◆ Flower – Introduction to four Whorls of flower, types of flower based on position of ovary

Unit-4

- ◆ Gymnosperms : General characters
- ◆ Cycas : Distribution, Plant Habit, morphology, anatomy (with include leaflet and coralloid root only), Spore producing structures
- ◆ Angiosperms : General Characters
- ◆ Outline classification of Bentham and Hooker's system
- ◆ General characters of Families – Malvaceae, Solanaceae, Cucurbitaceae
- ◆ Plant of economic importance of –
Malvaceae : Jasud (Hibiscus rosa-sinensis), Bhoj Kanski(Abutilon indicum), Bhindi (Abelmoschus esculentus), Cotton(Gossypium arboretum)
- ◆ Solanaceae : Brinjal (Solanum melongena), Ashwagandha (Withania somnifera) Tobacco (Nicotiana tabacum), Chilli(Capsicum annum)
- ◆ Cucurbitaceae:Galka (Luffa cylindrica), Pumpkin(Cucurbita maxima) Kakdi (Cucumis sativus), Karela(Momordica charantia)

Suggested Reference Books:

1. Pelczar - Introductory Microbiology
2. Clifton - An Introduction to Bacteria
3. Verma, J.P -The Bacteria
4. Davis -Microbiology
5. P. K. Gupta -Cell Biology
6. C. B. Pawar - Cell Biology
7. Singh and Tomar -Cell Biology
8. Verma and Agrawal -Cell Biology
9. P. C. Vashishta – Gymnosperms
10. B. Johri & Biswas - Gymnosperms
11. N. S. Subramanyam –Modern Plant Taxonomy
12. O. P. Sharma - Plant Taxonomy
13. B. P. Pandey - Taxonomy of Angiosperms
14. P. C. Vashishta - Taxonomy of Angiosperms
15. Y. D. Tyagi & S. Kshetrapal - An Introduction to Taxonomy of Angiosperms

SARADAR PATEL UNIVERSITY
FIRST YEAR B.Sc. (FIRST SEMESTER)
BIOLOGY Practical (FSBI-103)
EFFECTIVE FROM JUNE 2010.
(2 Credits, Four hours per week)
(Total Marks-100, Internal – 30 Marks, External – 70 Marks)

Part-1 Zoology Practicals

1. Study of Planktons
2. Classification of Phylum Protozoa, Porifera and Coelenterata- Euglena, Plasmodium, Leucosolenia, Hyalonema, Bathsporgia, Aurelia, Physalia, Sea-anemone, Favia and Fungia and Study of permanent slides of Hydra- L.S, T.S through testis, T.S through ovary.
3. Classification of Phylum Platyhelminthes, Nematelminthes and Annelida – Planaria, Liverfluke, Tapeworm, Ascaris, Nereis, Earthworm, Leech.
4. Classification of Phylum Arthropoda – Peripatus, Crab, Millipede, Grasshopper, Butterfly, Spider and Metamorphosis in insects (Mosquito).
5. Classification of Phylum Mollusca, Echinodermata and Hemichordata – Dentalium, Chiton, Pila, Bivalve, Brittlestar, Sea Cucumber, Sea Urchin, Sea Lily and Balanoglossus.
6. Study of Parasites – Filaria, Plasmodium, Tapeworm and Trypanosoma.
7. Dissection of Earthworm: External Characters and Digestive system with mounting of setae and Spermatheca.
8. Dissection of Earthworm: - Reproductive system with mounting of Blood glands and Septal nephridia.
9. Dissection of Earthworm: - Nervous system with mounting of Ovary.
10. Dissection of Cockroach: - External Characters and Digestive system with mounting of Gizzard, Cornea, Spiracles and leg.
11. Dissection of Cockroach: - Reproductive system with mounting of Mouth parts and Salivary Glands.
12. Dissection of Cockroach: - Nervous system with mounting of Trachea, Male and Female Gonapophysis.

PART - 2 Botany Practicals.

1. Study of Electron Micrograph – Mitochondria, Chloroplast, Nucleus, Golgi Complex.
2. Study of various stages of Mitosis in Onion root-tip.
3. Study of virus infected plant specimens, Study of Bacteria with help of P.S.
4. Study of Internal Structure of Cycas leaflet (T.S) Cycas-Male Cone. Microsporophyll and Megasporophyll (specimens)
5. Study of Leaf.
6. Study of Inflorescence.
7. Study of Flower.
8. Study of aestivation and placentation.
9. Study of family: Malvaceae.
10. Study of family: Solanaceae.
11. Study of family: Cucurbitaceae.
12. Study of family: Rubiaceae.

SARDAR PATEL UNIVERSITY
FIRST YEAR B.SC (FIRST SEMESTER)
Effective Course FSELE101 - BIOLOGY
EFFECTIVE FROM JUNE-2010
(2 Credits, Two hours per week)
(Total Marks-100.Internal-30 Marks, External-70 Marks)

Unit-1 Animal Cell and Tissue

Prokaryotic and Eukaryotic cell
Animal cell-Structure and composition
Outline Classification of Animal tissues
Importance of Vitamins and Minerals, Deficiency diseases

Unit-2 Economic zoology and adaptation

Economically important insects
Environmental adaptations- Aquatic, Aerial, Desert, Burrowing, Arboreal And Mimicry
Poisonous and non poisonous snakes

Unit-3

- **Plant cell-** structure of prokaryotic and eukaryotic cell
- **Plant tissue-** structure and functions of:
Meristematic tissue (Apical and lateral tissue)
Permanent tissue simple tissue-parenchyma, collenchyama, sclerenchyma, Complex tissue- Xylem and phloem
- **Plant morphology**
Annuals, perennials,herbs,shrubs,trees,climbers
Leaf :Parts of leaf – leaf base,petiole,leaf lamina.
Type of leaf : Simple, Compound
Phyllotaxy : Alternate, Opposite and Whorled
Inflorescence:Racemose, Cymnose
Flower :Calyx, corolla, Androecium, Gynoecium

Unit-4

Economic Importance of Plants (Brief description of plant and uses)
Cereals- Wheat, Rice
Pulses: Chickpea, Pession pea
Plant Fibers: Cotton, Jute
Timber: Teak,sal
Vegetables-Tomato, Potato, Brinjal , Onion
Spices- Clove, Cinnamon
Oil yielding plants- Groundnut, Sunflower
Medicinal Plants- Tulsi, Neem

LIST OF REFERANCE BOOKS:

1. Invertebrate Zoology- Jordan and Verma
2. Economics Zoology- Shukla and Upadhyay
3. Handbook of Economics Zoology- Jawaid Ahsan, Subhash Prasad Smha
4. Vertebrate Zoology- Jordan and Verma
5. Evolution- Verma,Rastogi and Agrawal
6. Invertebrate zoology- R.L.Kotpal
7. Vertebrate Zoology- R.L.Kotpal
8. Human anatomy and physiology- Tortora and Grabowsky
9. Cell biology, genetics, molecular biology, evolution and ecology, P.S. Verma and V.k.Aggrawal
10. Books of Indian Birds-Salim Ali
11. N.S.Subramanyam- Modern Plant Taxonomy
12. O. P. Sharma- Plant Taxonomy
13. B. P. Pandey- Taxonomy of Angiosperms.
14. P. C. Vashishta- Taxonomy of Angiosperms.
15. Y. D. Tyagi & S. Kshetrapal- An Intoduction to Taxonomy of Angiosperms.
16. Hill- Economic Botany.
17. P. L. Kochar- Economic Botany
18. M. Daniel- A Phytochemical Approach to Economic Botany