AZ 1506 – INVERTEBRATA

SEMESTER	**: I**	**CREDIT**	**: 04**
CATEGORY	**: MC**	**NO. OF HOURS / WEEK**	**: 04**

Objectives: *To impart knowledge on invertebrate animals and their phylogenetic significance.*

UNIT I: PROTOZOA TO ANNELIDA

Organization: *Paramecium* - *Ascon* sponge – *Obelia* – *Ascaris* - *earthworm* – *Hirudinaria*.

UNIT II: ARTHROPODA TO ECHINODERMATA

Organization: *Penaeus* – *Periplaneta* - Scorpion – *Pila* – Sepia -Starfish.

UNIT III: TAXONOMIC STATUS

Diagnostic characters and classification of each phylum upto class level with examples.

UNIT IV: COMPARATIVE STUDY

Parasitic protozoans any five, Canal systems in sponges, Coral and coral reefs, Parasitic adaptations, Nematode parasites of man and water vascular system in Echinoderms.

UNIT V: PHYLOGENY

Affinities of Peripatus, Metamerism and Coelom, Mouth parts in insects, Social life in Insects and Larval forms of Echinoderms

SUGGESTED READING

1. Ekambaranatha Ayyar and T.N.Ananthakrishnan, 1995 A Manual of Zoology Vol.I (Part 1,2) S.Viswanathan, Chennai.
2. Barnes, 1995 Invertebrate Zoology, W.B.Saunders, Philadelphia.
3. Kotpal, R.L. 2005. Invertebrates, Rastogi, Meerut.
4. Nayar, N.C., S. Leelavathy., N. Soundarapandian., T. Murugan and N. Arumugam, 2004. A Text Book of Invertebrates. Saras, Nagercoil.

AZ 1507 - INVERTEBRATA LAB COURSE

SEMESTER	**: I**	**CREDIT**	**: 02**
CATEGORY	**: MC (P)**	**NO. OF HOURS / WEEK**	**: 02**

Objectives: *To observe the anatomy and structural modifications in invertebrates and to develop dissection skill.*

UNIT I: MAJOR DISSECTION

Cockroach: Digestive system, Circulatory systesm, Nervous system, Reproductive system - *Pila:* Nervous system - Leech / Earthworm: Nervous System, Reproductive system -Prawn: Nervous system (including Appendages).

UNIT II: MINOR DISSECTION

Earthworm: Viscera, Lateral hearts - *Pila*: Digestive system (Including radula) - Freshwater Mussel: Digestive system

UNIT III: MOUNTING

Earthworm: Body setae; Pineal setae - Cockroach: Salivary apparatus, Mouth parts

Pila: Radula - Freshwater muscle: Pedal ganglia - Honey Bee, House fly, Mosquito mouth parts

UNIT IV: SPOTTERS

Representatives from each phylum based on structural organisation and phylogeny.

UNIT V: RECORD

SUGGESTED READING

1. Lal, S.S. 2005. A text Book of Practical Zoology: Invertebrate, Rastogi, Meerut.
2. Ekambaranatha Ayyar and T.N.Ananthakrishnan, 1995 A manual of Zoology Vol.I (Part 1,2) S.Viswanathan, Chennai.
3. Barnes, 1995 Invertebrate Zoology, W.B.Saunders, Philadelphia.

AZ 1508 - ECONOMIC ENTOMOLOGY

SEMESTER	**: I**	**CREDIT**	**: 03**
CATEGORY	**: MC**	**NO. OF HOURS / WEEK**	**: 03**

Objectives: *To study the economic importance of insects and insect pest management.*

UNIT I: Outline Classification of the Class Insecta. Causes for Insects Assuming Pest Status.

UNIT II: Most common insect pests rice and their control: Rice thrips, brown planthopper and rice earhead bug. Insect pests of stored grains their preventive and curative methods: internal feeder, external feeder and scavenger. Locust and its control.

UNIT III: Insects in relation to public health and their control: Mosquito, House fly, Eye fly, Sand fly, Bed bug, Flea and head louse. Most common insect pests of domestic animals and their control: Stable fly, Shaft louse and Head maggot.

Unit IV: Apiculture: Introduction, types of honey bees, hive, apiary, selection of bees for apiary, Newton's bee hive, enemies of honey bees, diseases of honey bees and conclusion. Sericulture: introduction, types of silk worms, silk worm races, life history of mulberry silk worm, features of sericulture industry, pests of silk worm, diseases of silk worm and conclusion.

Unit V: Pest Management; Elementary knowledge of insecticide, Biological control of Insect pests and Integrated Pest Management.

SUGGESTED READING

1. Vasantharaj David,B 2001. Elements of Economic Entomology, Popular Book Depot, Chennai
2. Ministry of Agriculture, Government of India, 1995. Manual on Integrated Pest Management in Rice & Cotton
3. John William S., 1995. Management of Natural Wealth, Loyola College Publications, Chennai.
4. John William,S., 2007. Defeating The Public Enemy The Mosquitoes: A real Challenge, Loyola College Publications Chennai.
5. Abishek Shukla,D 2009. A Hand Book of Economic Entomology, Vedams e Books, New Delhi.

AZ 2104- ANIMAL DIVERSTIY

SEMESTER	**:**	**II**	**CREDIT**	**:**	**03**
CATEGORY	**:**	**MC**	**NO. OF HOURS / WEEK**	**:**	**04**

Objectives: *To observe the organization, functional morphology and diversity of representative invertebrates and chordates.*

UNIT I*: Structure, organization and life history of Entamoeba histolytica and Plasmodium vivax, Obelia geniculata.*

UNIT II: Structure, organization and life history of *Taenia solium,* Nematode parasites of man - *Ascaris, Hirudinaria.*

UNIT III: Structure, organization and life history of *Penaeus indicus, Pila globosa,* Star fish.

UNIT IV: Organization of Frog, Calotes, Pigeon and Rat.

UNIT V: Types of chordata eggs; extra embryonic membranes and their functions in chick, placentation in mammals.

SUGGESTED READING

1. Ekambaranatha Ayyar and T.N.Ananthakrishnan, 2008. A manual of Zoology Vol.I & II (Part 1,2) S.Viswanathan, Chennai.
2. Barnes,R.D 2001. Invertebrate Zoology, W.B.Saunders.
3. Verma, P.S., Agarwal, V.K and Tyagi B.S. 1995. Chordate embryology, S.Chand, New Delhi.
4. Berril, N.J. 1971. Developmental Biology, Mc Graw Hill, New York.

AZ 2105- ANIMAL DIVERSITY LAB COURSE

SEMESTER	**:**	**II**	**CREDIT**	**:**	**01**
CATEGORY	**:**	**MC (P)**	**NO. OF HOURS / WEEK**	**:**	**02**

Objectives: *To observe the organization, functional morphology and diversity of representative invertebrates and chordates*

Unit I: MAJOR DISSECTION

Cockroach: Digestive system, Nervous system. Freshwater mussel: Digestive system
Prawn: Nervous system. Frog: Arterial system, venous system

UNIT II: MINOR DISSECTION

Earthworm: Lateral hearts. Cockroach: Reproductive system

UNIT III: MOUNTING

Cockroach: Mouth parts, salivary apparatus. Earthworm: Body setae. Prawn: Appendages. Frog: Hyoid apparatus: Brain.

UNIT IV: SPOTTERS

Representatives from each phylum based on structural organization and phylogeny.

UNIT V: RECORD

Submission of certified laboratory record is mandatory.

SUGGESTED READING

1. Lai, S.S. 2005. A Text Book of Practical Zoology: Invertebrate, Rastogi, Meerut.
2. Ekambaranatha Ayyar and T.N.Ananthakrishnan, 2008 A manual of Zoology Vol.I & II (Part 1,2) S.Viswanathan, Chennai.
3. Barnes, R.D 2001 Invertebrate Zoology, W.B.Saunders, London.

AZ 2504 - CHORDATA

SEMESTER	**: II**	**CREDIT**	**: 04**
CATEGORY	**: MC**	**NO. OF HOURS / WEEK**	**: 04**

Objectives: *To elaborate the organization, functional morphology diversity and taxonomical position of chordates.*

UNIT I: Chordate characteristics- Systematic position of Cephalochordata and Urochordata.

UNIT II: Characteristics of subphylum vertebrata, Classification of vertebrata upto class level. Agnatha - Organization of shark - Importance of fishes and their biological significance- Organization of frog- Parental care in fishes and amphibia.

UNIT III: Organization of *Calotes versicolor*- Impact of terrestrialisation- Arcades and fossae of reptilian skulls in classification of reptiles- Identification of poisonous snakes - Poison apparatus, biting mechanism and snake venom.

UNIT IV: Organization of pigeon- Flightless birds – Flight adaptations - Migration in birds- Organization of rat - Classification of living mammals upto order level– structure and affinities of Prototheria- Metatheria.

UNIT V: Fate of aortic arches in chordates - Jaw suspension in vertebrates - Placentation in mammals- Systematic position of man.

REFERENCES:

1. Ekambaranatha Ayyar and T.N. Ananthakrishnan, 2008 A manual of Zoology Vol II, Part I and II,S.Viswanathan, Chennai.
2. Young, J, Z 1972. The life of vertebrates. Oxford Univ., London.
3. Newman, H.H.1956 The Phylum Chordata, MacMillan, London.

AZ 2505 - CHORDATA LAB COURSE

SEMESTER : II **CREDIT : 02**

CATEGORY : MC (P) **NO. OF HOURS / WEEK : 02**

Objectives: *To study the organization, functional morphology, adaptive modification and evolutionary significance of chordates.*

UNIT I: MAJOR DISSECTIONS

Shark: Arterial system and cranial nerves (Demonstration only)

Frog: Arterial system - Venous system, Cranial nerves- V and X.

Rat: Arterial system - Venous system

UNIT II: MINOR DISSECTIONS

Shark: Placoid scales. Frog: Hyoid apparatus and Brain.

UNIT III: SPOTTERS

Adaptive modification and evolutionary significance: Prochordates – Fishes – Amphibian – Reptiles - Birds and Mammals- Skeletal structures of frog, calotes and rat.

UNIT IV: EMBRYOLOGY

Stages in the development of Amphioxus, Frog and Chick- Placenta in shark and mammals.

UNIT V: RECORD

Submission of certified laboratory record is mandatory.

REFERENCES:

1. Lal, S.S., 2005. A text Book of Practical Zoology: Vertebrate, Rastogi, Meerut.
2. Ekambaranatha Ayyar and T.N. Ananthakrishnan, 1998 A manual of Zoology Vol II, Part I and II, S.Viswanathan, Chennai.
3. Young, J,Z., 1972. The life of vertebrates. Oxford Uni. London.
4. Newman,H., 1956.The Phylum Chordata, MacMillan, London.

AZ 2506- BASIC BIOTECHNOLOGY

SEMESTER : II	**CREDIT**	**:**	**03**
CATEGORY : MC	**NO. OF HOURS / WEEK**	**:**	**03**

Objectives: *To outline the basics of Biotechnology - scope and importance and to understand the interdisciplinary activity.*

UNIT I: INTRODUCTION TO BIOTECHNOLOGY

Definition - interdisciplinary activity- scope and importance.

Biotechnology global scenario - International safety guidelines - Patent law and intellectual property rights.

UNIT II: PRINCIPLES OF TISSUE CULTURE

Culture media - Primary culture and cell lines - Organ culture. Industrial application of animal tissue culture

UNIT III: FUNDAMENTALS OF r-DNA TECHNOLOGY

Restriction enzymes: classification - Nomenclature and activity - Restriction mapping of DNA; Plasmids, Cosmids and transposons. Molecular cloning - construction of genomic libraries - Indirect cloning - cDNA preparation and uses of DNA probes .

UNIT IV: BIOCHEMICAL ENGINEERING

Basic concepts of fermentation- bioreactor design- biosensors

UNIT V: AGRICULTURE AND AQUACULTURE BIOTECHNOLOGY

Applications in agriculture: micropropagation of biomass – nitrogen fixation – GMO's.

Applications in aquaculture: improved diagnostics- hormones and feeds- genetic manipulation. Cryopreservation – Transgenic fish - Nutritional quality.

SUGGESTED READING

1. Ignacimuthu S, 2008. Basic Biotechnology. Tata McGraw-Hill, New Delhi.
2. Ranga, M.M., 2003. Animal Biotechnology, Agrobios, New Delhi.
3. Lohar, P.S., 2005. Biotechnology, MJP, Chennai.
4. Satyanarayana, U., 2005. Biotechnology, Books and Allied, Kolkata.
5. Ramawat *et al.,* 2009 Comprehensive Biotechnology, S.Chand & Compy, New Delhi.