

BACHELORS WITH ZOOLOGY AS MAJOR (CT – III)

6th SEMESTER

ZOL622J3 ZOOLOGY _ FUNDAMENTALS OF ICHTHYOLOGY

CREDITS: THEORY: 04; PRACTICAL: 02

COURSE OBJECTIVE:

To impart knowledge about the classification and evolution of fishes, modification of various body structures, knowledge about the structure and function of various organs.

LEARNING OUTCOME:

Students will benefit from the course's in-depth coverage of the taxonomy of the major fish groups, as well as their evolutionary history, morphology, physiology and anatomy. In particular, the students will learn about the taxonomy and identification of fish, with a focus on local freshwater fish. They will also gain knowledge about the anatomy and physiology of fish.

THEORY (4 CREDITS)

UNIT 1: SYSTEMATICS AND MORPHOLOGY

- 1.1 Outline classification of fishes with distinguishing characters upto orders
- 1.2 Adaptive radiation in Elasmobranchii and Actinopterygii
- 1.3 Structure, types and modification of scales and fins
- 1.4 Colouration in fishes

UNIT II: FISH ANATOMY AND PHYSIOLOGY-I

- 2.1 Digestive system and physiology of digestion
- 2.2 Structure and function of gills; Accessory respiratory organs; Swim bladder
- 2.3 Structure and function of heart and blood vessels
- 2.4 Structure and function of kidneys (Excretion and Osmoregulation)

UNIT III: FISH ANATOMY AND PHYSIOLOGY-II

- 3.1 Reproductive organs in fishes (Teleost)
- 3.2 Structure and function of the nervous system (Teleost)
- 3.3 Sense organs and their function
- 3.4 Structure and function of endocrine organs

UNIT IV: SKELETON AND MOVEMENT

- 4.1 Endoskeleton in fishes: Axial Skelton (Typical trunk vertebrae and caudal vertebrae); Appendicular skeleton (girdles)
- 4.2 Structure and significance of Weberian ossicles
- 4.3 Musculature in fishes
- 4.4 Locomotion in fishes

PRACTICALS (2 CREDITS)

1. A general survey of Elasmobranchii, Holocephali, Dipnoi and Teleostei
2. Identification and classification of fish fauna of Jammu & Kashmir
3. Morphometric and meristic characters of fishes
4. To study the general anatomy of fish (alimentary canal, gills, gonads, etc.)
5. Study of feeding habits of herbivorous, carnivorous, and omnivorous fish by gut content analysis of fishes: *Schizothorax*, Trout, and Carp
6. Histological study of different organ systems of fish from prepared slides
7. Study of scales and age determination of fishes using scales (Carp, *Schizothorax*, and *Scoliodon*)
8. Dissection of the nervous system of fish.

SUGGESTED BOOKS / READING MATERIAL

1. Fish and Fisheries of India by V. G. Jhingran (Hindustan Publishing Corporation)
2. A Text Book of Fish Biology & Fisheries by S.S Khanna and H.R Singh (Narendra Publishing House)
3. Biology of Fishes by Q. Bone and R. Moore (Taylor & Francis)
4. The Physiology of Fishes by D.H. Evans, J.B. Claiborne and S. Currie (CRC Press)
5. Fishes: An Introduction to Ichthyology by Peter B. Moyle and Joseph J. Cech Jr. (Prentice Hall India Learning Private Limited)
6. An Introduction to Fishes by H.S. Bhamrah and Kavita Juneja (Anmol Publications Pvt Ltd)
7. An Introduction to Fishes by G.S. Sandhu (Campus Books International)
8. Fish and Fisheries by B.N. Yadav (Daya Publishing House)
9. A History of Fishes by J.R. Norman and P.H. Greenwood (Ernest Benn Limited)
10. Ichthyology: The study of Fishes by K.F. Lagler, J.E. Bardach, and R.R. Miller (John Wiley & Sons)
11. Anatomy of Fishes Part I by Wilhelm Harder (Schweizerbart'sche Publishing House)
12. Fish and Fisheries by K. Pandey and J.P. Shukla (Rastogi Publication)