

Govt. Degree College Baramulla (Autonomous)

SEMESTER 1st COURSE - MAJOR/MINOR

Subject: Industrial Fish and Fisheries

Title: Fish and Shell Fish Biology

Code: BIF22C101

CREDIT: (4+2) THEORY: 04; PRACTICAL: 02

CONTACT HOURS: 60 (Theory) + 30 (Practicals)

Part 1: Theory (4 Credits)

Course Objectives:

- *To introduce students to the basic concepts of Identification and Classification of fish and other aquatic organisms*
- *To provide knowledge about diversity of fishes.*
- *To understand the basic concepts morphology and anatomy of fish and shell fish*

Learning outcomes:

On completion of the course, the student should be able to:

- *Identify and classify the fish and other aquatic organisms.*
- *Understand the morphological, anatomical and physiological diversity of fish and shellfish.*

UNIT I: Fish Taxonomy and Diversity

(15 Contact hours)

- 1.1 General characters and importance of fishes
- 1.2 Fish Diversity in terms of size, shape, endoskeleton, habitat and other characters
- 1.3 Classification of fish upto order level.
- 1.4 Methods of fish identification (morphometric and meristic)
- 1.5 Variation in form structure of fishes–
 - 1.5.1 Structure and function of skin
 - 1.5.2 Colouration in fishes
 - 1.5.3 Types of scales
 - 1.5.4 Fish Mouth modifications
 - 1.5.5 Types of fins

Unit II: Morphology of fish and shellfish

(15 Contact hours)

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- 2.1 Morphology of Common carp, *Schizothorax* and Trout fish
- 2.2 Morphology of prawn, crab and cephalopod (Squid)
- 2.3 Commercially important fish species of India (Labeo, Oil Sardine and Hilsa).
- 2.4 Commercially important shell fish species of Indian origin (*Penaeus indicus*, *Marcrobrachium rosenbergii*, crab and Squid).

Unit III: Anatomy and Physiology -I

(15 Contact Hours)

- 3.1 Alimentary canal and its associated structures.
- 3.2 Gills, swim bladder and accessory respiratory organs.
- 3.3 Heart and circulatory system.
- 3.4 Excretion and osmoregulation

UNIT IV: Anatomy and Physiology –II

(15 Contact Hours)

- 4.1 Nervous system, Brain, Spinal cord.
- 4.2 Sensory organs (Eye and lateral line).
- 4.3 Endocrine system (Pituitary, Pineal and Thyroid glands)
- 4.4 General organisation of internal organs of prawn and cephalopod.

Books Recommended:

1. Ichthyology by Lagler
2. Fish and Fish biology by HR Singh and S S Khanna
3. A history of fishes by Greenwood, P. II.
4. Fishes – An introduction to Ichthyology by P.S. Moyle.
5. The Biology of Fishes By Kyle H.
6. The life of fishes by Marshal. N.B.
7. The Marine and Fresh water fishes of Ceyon.
8. Inland fishes of India and adjacent countries, Vol. I and II By Talwar P.K. and Jhingran, V.G.
9. Commercial Sea Fishes of India By Talwar P. K. And R.K. Baker.

Part 2: Practicals (2 Credits)

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Course Objectives:

- *To demonstrate the external morphology of fish and shellfish.*
- *To study the procedure of dissection of fish for different anatomical study.*

Learning outcomes:

On completion of the course, the student should be able to:

- *Identify different fish species*
 - *Dissect open the fish for anatomical study*
1. Museum survey (Morphological study) of
 - (a) Common Carp
 - (b) *Schizothorax*
 - (c) Trout
 - (d) *Labeo rohita*
 - (e) Oil Sardine
 - (f) *Hilsa*
 - (g) Crustacean (Prawn, Crab and Lobster)
 - (h) Mollusk (Squid, Loligo and Octopus)
 2. Study of structural modifications of
 - (a) Mouth
 - (b) Fins
 3. Morphometric and Meristic study
 4. Dissection/ Anatomical study
 - (a) Digestive system of prawn/ fish
 - (b) Circulatory system of fish
 - (c) Nervous system of fish/ prawn
 5. Field visit to various fish farms and hatcheries
 6. Field visit to various fish landing centre / Fish market

Books Recommended:

1. A practical manual of fish biology and ecology (fisheries) by Dr. Ravi Shankar Piska and Dr. S. Jithender Kumar Naik
2. Fish fauna of India and Adjacent countries by Raj Tilak, Fisheries Survey of India
3. Fishes of India by Qureshi and Qureshi