

II SEMESTER
Course No.: 4 -Biology of Fin Fish & Shellfish
credits :3

Course outcomes:

1. Gain Knowledge of feeding habits, gut content analysis and growth factors in fishes.
2. Understand the commercial importance of crustaceans and Fish
3. Understand and learn breeding in fishes, breeding habits, method of induced breeding in fishes.
4. To create awareness on parental care of Fishes and embryonic and larval development and environmental factors affecting development of major aquaculture organisms.
5. Acquire knowledge about Endocrine system in fishes.

SYLLABUS

UNIT- I: Specialised organs in fish

- 1.1 Sense organs of fishes and crustaceans .
- 1.2 Specialized organs in fishes – electric organ, venom and toxins
- 1.3 Buoyancy in fishes- swim bladder and mechanism of gas secretion
- 1.4 Fish and Crustaceans of commercial importance

UNIT- II: Food, Feeding and Growth

- 2.1 Natural fish food, feeding habits, feeding intensity, stimuli for feeding, utilization of food, gut content analysis, forage ratio
- 2.2 Principles of Age and growth determination; growth regulation, Growth rate measurement – scale method, otolith method, skeletal parts as age indicators
- 2.3 Length-frequency method, age composition, age-length keys, absolute and specific growth, back calculation of length and growth, annual survival rate,
- 2.4 Length-weight relationship.

UNIT- III: Reproductive Biology

- 3.1 Breeding in fishes, breeding places, breeding habits & places, breeding in natural environment and in artificial ponds, courtship and reproductive cycles
- 3.2. Induced breeding in fishes
- 3.3 Breeding in shrimp, oysters, mussels, clams, pearl oyster, pila, and cephalopods.

UNIT- IV: Development

- 4.1. Parental care in fishes, ovo-viviparity, oviparity, viviparity, nest building and brooding
- 4.2 Embryonic and larval development of fishes
- 4.3 Embryonic and larval development of shrimp, crabs and molluscs of commercial importance
- 4.4 Environmental factors affecting reproduction and development of cultivable aquatic fin & shell fish

UNIT- V: Hormones & Growth.

- 1.1 Endocrine system in fishes.
- 1.2 Neuro-secretory cells, androgenic gland, ovary, chromatophores,
- 1.3 Molting, molting stages, metamorphosis in crustacean shell fish

II SEMESTER
Course No.: 4 -Biology of Fin Fish & Shell Fish
credits :1

1. Length-weight relationship of fishes
2. Gut content analysis in fishes and shrimp
3. Mouth parts and appendages of cultivable prawns, shrimps and other crustaceans
4. Study of eggs of fishes, shrimps, prawns and other crustaceans
5. Study of oyster eggs
6. Embryonic and larval development of fish
7. Study of gonadal maturity and fecundity in fishes and shellfish
8. Observation of crustacean larvae
9. Study of nest building and brooding of fishes

PRESCRIBED BOOK(S)

1. Bone Q et al., 1995. Biology of fishes, Blackie academic & professional, LONDON.
2. Saxena AB 1996. Life of Crustaceans. Anmol Publications Pvt.Ltd., New Delh

REFERENCES:

1. Tandon KK & Johal MS 1996. Age and Growth in Indian Fresh Water Fishes. Narendra Publishing House, New Delhi.
2. Raymond T et al., 1990. Crustacean Sexual Biology, Columbia University Press, New York
3. Guiland J.A (ed) 1984. Penaeid shrimps- Their Biology and Management. 1.18Barrington FJW 1971. Invertebrates: Structure and Function.ELBS
4. 1.19Parker F & Haswell 1992. The text book of Zoology, Voll. Invertebrates (eds. Marshal AJ & Williams). ELBS & Mc Millan & Co.