

**Course Code: ZOO 301**  
**Number of Credits: 3**  
**Effective from AY: 2020 -21**

**Course Title: Fishery Biology**

<b>Prerequisite for the Course:</b>	Basic knowledge on animal anatomy, physiology and endocrinology	
<b>Objectives:</b>	<p>To understand the various aspects of fisheries.</p> <p>To understand the potentiality of fisheries in India, more particularly in Goa.</p>	
<b>Content</b>	<p><b>Module1:</b></p> <p>Fish diversity: Fish Classification and diversity of freshwater and Marine fishes of India.</p> <p>Gas exchange and swimming: Air breathing organs and gas bladder; Swimming modes (fin versus body trunk), swimming muscles and tail beat.</p> <p>Fish Reproduction: Sexual maturity and breeding season of various cultivable species; Development of gametes in male and female; Endocrine control of fish reproduction. Fecundity, Fish egg and embryonic development, Reproductive cycles, reproductive behaviour, parental care and migration.</p>	12 hr
	<p><b>Module 2:</b></p> <p>Different Types of culture practices: Monoculture, Monosex culture, Cage culture, Pen culture, and Integrated culture.</p> <p>Culture of Freshwater Indian major carps and ornamental (lacustrine) fish culture; Shell fish culture (prawns) practice and scope in India.</p> <p>Fish diseases, Immune response to pathogens.</p> <p>Management of fish farm/ ponds; Aquatic weeds and their control.</p> <p>Integrated health management of farm.</p> <p>Fish nutrition: Sources of food, feed compositions, Forms of feeds: wet feeds, moist feeds, dry feeds, mash, pelleted feeds, floating and sinking pellets, farm made feeds using local ingredients.</p> <p>Feed storage: Methods of storage and degradation. Use of preservatives and antioxidants in feed. Feed evaluation: Feed Conversion Ratio (FCR); Feed Efficiency Ratio (FER); Protein Efficiency Ratio (PER), Net Protein Utilization (NPU) and Biological Value (BV); Digestive enzymes, feed digestibility; Factors affecting digestibility.</p>	12 hr
	<p><b>Module 3:</b></p> <p>Fishery technology and economics: Fishing gears and crafts used in Indian coasts.</p> <p>Fish Industry: Fish preservation, transportation, processing Industries in India.</p> <p>Fishery economics: Status of Indian and global scenario. Major</p>	12 hrs

	pelagic and demersal fisheries of Indian coasts and strategies for its development and conservation. Stock replenishment, Sea ranching and FADs. Fish supply chains and export.	
<b>Pedagogy:</b>	Lectures/ tutorials/assignments/self-study	
<b>Learning Outcome:</b>	1. Understanding the socio-economic development through Fisheries. 2. Acquiring the basic knowledge about the Fisheries as to set entrepreneurship.	
<b>References /Reading</b>	1. Jhingran V, (1982) Fish and Fisheries of India 2 <sup>nd</sup> Ed (Hind Publication Comp 2. Biswas K P, (1996) A Text Book of Fish, Fisheries and Technology, 2 <sup>nd</sup> ed. (Narendra Publishing House) 3. Kumar S and Thembre M (1996 )Anatomy and Physiology of Fishes (Vikas Publishing House) 4. Selvamani B.R and Mahadevan R.K (2008) Freshwater fish farming (Campus Books International) 5. Pillay T V S (1990)Aquaculture – Principles and practices (Fishing News Books Oxford 6. Bal D, and Rao K P(1984) Marine Fisheries of India, Tata McGraw Hill Publishers. 7. DuttaMunshi, J (2006) , Fundamentals of Freshwater Biology, Narendra Publishing House, Delhi. 8. Kurian, C and Sebastain VO (2002), Prawn and Prawn Fisheries of India, Hindustan Publishing Corp., Delh.	