



# **Syllabus of**

**B.Sc. Third Year  
(Fishery Science)**

**Semester V & VI**

**Effective from June 2011 and onwards**

**B.Sc. III (Fishery Science)  
V and VI Semester Course Structure**

Semester	Theory Paper	Paper	Practical Paper	Paper No.
1	2	3	4	5
V Semester	Fishery Economics	XVII	Based on Theory XVII	XIX
	Modern Trends in Fishery Science-I	XVIII	Based on Theory XVIII	XX
VI Semester	Fish Stastics, management & Extension	XXI	Based on Theory XXI	XXIII
	Modern Trends in Fishery Science-II	XXII	Based on Theory XXII	XXIV

### **B.Sc. III (Fishery Science)**

#### **Semester V**

## **Paper XVII**

### **Fish Economics**

#### **Unit A : 1. Economic Terminology**

- a. Scarcity
- b. Choice
- c. Scale of Preference
- d. Definitions in Economics
- e. Macro Economic Tools
- f. Economic Systems
- g. Market Economy
- h. Disadvantages of market economy
- i. Planned economy
- j. Mixed economic systems

#### **2. Functions of an economic system**

- a) Aquaculture economics

10

#### **Unit B : Demand and Supply of Fish**

##### **Introduction**

##### **a) Consumer Demand**

1. Demand Schedule
2. Demand Curve
3. Demand and quantity Demanded
4. Factors affecting the demand for fish and fish products
5. Population size and distribution
6. Consumer income and distribution
7. Prices and availability of substitutes
8. Consumer tastes and preferences

##### **b) Elasticity of Demand**

1. Price elasticity of demand

2. Calculation of own Price elasticity of demand
3. Determinants of price elasticity
4. Income elasticity
5. Cross-price elasticity
6. Elasticity, total and marginal revenue
7. Producer supply
8. Elasticity of supply
  - a) Price elasticity supply
  - b) Calculating supply elasticities
  - c) Price flexibilities
  - d) Short and long run supply curves
9. Competitive market equilibrium 20

### **Unit C: Fish Marketing**

1. Introduction
2. Traditional and modern fish marketing
3. Fish trade on micro and macro levels
4. Selling procedure for fish in India
5. Cost marketing and differential prices
6. Strategic fish marketing
7. Intensive growth
8. Diversification of growth 15

**Total** -----  
**45**

**B.Sc. III (Fishery Science)**

**Semester V**

## **Paper XVIII**

### **Modern Trends in Fishery Science – I**

#### **Unit A: Principles of Fish Genetics and Biotechnology**

1. Fish Genetic (Germ Plasm) Resources
2. Chromosomes and Genes.
3. Karyotyping
4. Cryopreservation of gametes (Gene banking)
5. Sex determination
6. Monosex culture
7. Sterile fish 10

#### **Unit B: Hybridization**

1. Hybridization in Indian Carps
2. Intra Specific and intergeneric hybrids
3. Natural Hybridization
4. Important hybrids
5. Inbreeding, cross breeding and selective breeding
6. Application of hybridization in fisheries 20

#### **Unit C: Chromosomal engineering**

1. Genome
2. Gynogenesis
3. Androgenesis
4. Polyploidy ( Triploids or Broiter fish)
5. Production of monosex super male and female by hormonal and six reversal technique. 15

<b>Total</b>	----
	<b>45</b>

### **B.Sc. III (Fishery Science)**

**Semester V****Paper XIX (Practical)**

1. Economics of pond culture and riverine fisheries	03
2. Field level data collection, tabulation, analysis and Report writing (Inland fishery catch from nearby villages)	05
3. Study of organizational structure and their role in fisheries viz. a) Fishermen co operative society b) FFDA (fish farmers development Agency) c) State and central Government organization i.e. ministry of fisheries. d) Fish processing unit any four	07
<b>Total</b>	<b>----- 15</b>

**B.Sc. III (Fishery Science)**

**Semester V****Paper XX (Practical)**

1. Collection and observation of gametes from fresh water fishes	02
2). Polyploidy evaluation using erythrocyte measurements	02
3). Cryopreservation of gametes	03
4). Chromosome karyotyping	03
5). Sex determination in fin-fishes and shell-fishes	03
6).Determination of hybrids in major carps (Rohu - catla hybrid)	02

**Total**

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**15****B.Sc. III (Fishery Science)**

**Semester VI****Paper XXI****(Fish Statistics, Management and Extension)****Unit A: Statistics**

1. Definition and scope of statistics
2. Collection and organization of data
3. Representation of data by graphs, charts and diagrams
4. Classification of data according to attributes and class intervals
5. Construction of frequency tables and the criteria governing formulations of good table
6. Methods of computing mean, median and mode of grouped and ungrouped data

25

**Unit B: Management and Extension**

1. Nature of fisheries extension
2. fisheries extension and traditional management
3. Extension and co-operative development
4. Role of co-operative development in fisheries
5. Fisheries extension system India problems.
6. Future of fisheries extension
7. Communication and flow of information

15

**Unit C:** 1. Techno Socio-economic problem of fishermen

2. Role of women in fisheries

3. Need of technical knowledge to fishermen

05

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**Total** **45****B.Sc. III (Fishery Science)**



**Semester VI****Paper XXII****Modern Trends In fishery Science-II****Unit A: Immunology of fishes**

1. Introduction
2. Methods of immunology
3. Antibodies
4. Immunoglobulin's of fish
5. Specificity of fish antibodies
6. Blood groups in fishes
7. Cellular basis of immunological response 10

**Unit B: Microbiology**

1. Introduction to aquatic microbiology
2. Distribution of micro-organisms in environment
  - a. Aquatic micro-organisms in ponds and lakes
  - b. Aquatic micro-organisms in sea
3. Importance of aquatic microbes
  - a. Productivity of aquatic eco-systems
  - b. Bio-geochemical transformations
4. Microbiology of sewage or waste water 15

**Unit C: Contamination, preservation and spoilage of fish and other sea foods**

1. Contamination
2. Preservation
  - a. Use of heat
  - b. Use of low temperature
  - c. Use of irradiation
  - d. Preservation by drying
  - e. Use of preservatives
3. Spoilage
  - a. Factors influencing kind and rate of spoilage
  - b. Evidences of spoilage
  - c. Bacteria and causing spoilage
  - d. Spoilage of special kind of fish and sea foods 15

**Unit D: Application of remote sensing techniques for locating pelagic fish concentration 05****Total -----****45**

**B.Sc. III (Fishery Science)****Semester VI****Paper XXIII (Practical)**

1. Study of socio-economic conditions of fishermen from near By villages	05
2. Preparation of extension material like pamphlets, leaflets and posters	02
3. Preparation of Radio talks	03
4. Participation in Exhibitions	01
5. Interview of fish farmers	04

A detailed project of the above cited areas should be submitted at the time of examination.

<b>Total</b>	-----
	<b>15</b>

**B.Sc. III (Fishery Science)****Semester VI****Paper XXIV (Practical)**

1. Microbial analysis of fish	05
E-Coli	
S-aureus	
And identification of Solmonella and V-Cholera	
2. Determination of blood groups in fishes	03
3. Fish haematology	07
<b>Total</b>	<b>-----</b>
	<b>15</b>

**List of books recommended for paper XVII and XXI**

1. Curtis, M J. and Howard, A.C. (1997) Economics of Aquaculture. Food products press, New York.
2. Rao, P.S (1983) Fishery economics and management in India. Pioneer publishers and distributors D/9, Vanshree opposite Diamond Talkies LT road, Borivili (West), Bombay-400 092.
3. Mahesh V. Joshi (1996) Economics of fisheries. A.P. II. Publishing corporation, 5-Ansari Road, Darya Ganj, New Delhi.
4. P.N. Arora and P.K. Malhan (2002) Biostatistics, Himalaya publishing House.
5. Rama Krishnan, P. (1995) Biostatics, Saras publication A.R.P. camp Road, Periavilai, Kottar, po. Nagercoil, Kanyakumari- Dist. Pin- 629 002.
6. Banerjee, P.K. (2005) Introduction to Biostatics' S. Chand and Company Ltd. Ram Nagar, New Delhi- 110 055.
7. Norman T.J. Bailey (2004), Statistical methods in biology (Third Edition) Cambridge University press (Low price Editions).
8. Dr. Mungikar A.N. (1997) an introduction to Biometry, Saraswati publication, Aurangabad.
9. Ananth P.N. (2000), Marine Fisheries extension Discovery publishing house, New Delhi- 110 002.

**List of books recommended for paper XVIII and XXII**

1. Beaumont, A.R.: Biotechnology and Genetics in fisheries and Aquaculture, Narendra publishing House- Delhi-110 006.
2. Dr. Ranga M.M. and Dr. (Ms.) Shammi Q.J. (2005) : Fish Biotechnology, published by Agrobios (India) Agrohouse, Behind Nasrani Cinema, Chopasani Road, Jodhpur- 342 002.
4. Shrivastava C.B.L. (2000): A Text book of fishery science and Indian Fisheries Kitab Mahal; 28, Netaji Subhas Road, New Delhi-110 002.
5. Das, p. and Jhingran, A.G. (1976): Fish Genetics in India, Today and Tomorrow publishers, New Delhi.
6. Lakra, W.S. (2000): Fish Genetics and Biotechnology C.I.F.E. Mumbai.
7. Karuna Sagar and Reilly (1999): Aquaculture and Biotechnology Oxford and IBH pub. Co.Ltd. New Delhi.
8. Mani, A. and Selvaraj and others (1993): Microbiology (General and applied) Saras publication.
9. Frazier W.C. and Westhoff D.C. (1986): Food Microbiology (Third Edition) Tata Mc Graw- Hill pub.co.Ltd, New Delhi.
10. Douglas P.A. Anderson : Fish Immunology, Narendra publishing House- Delhi- 110 006.
11. George Iwama and Teruyuki Nakanishi: The fish Immune System. Academic press.
12. Large marine ecosystems: Exploration and Exploitation for sustainable development and conservation of fish stocks (1998) Proceedings of Symposium.

Edited by Dr. V.S. Somvanshi and published by FSI, Botawala chambers, Sir. P.M. Road, Mumbai- 400 001.