

# Vidyasagar University

## Curriculum for Industrial Fish & Fisheries (Major) [Choice Based Credit System]

### Semester-V

Course	Course Code	Name of the Subjects	Course Type/ Nature	Teaching Scheme in hour per week			Credit	Marks
				L	T	P		
CC- 11		C11T: Fisheries Statistics, Economics and Marketing	Core Course-11	4	0	0	6	75
		C11P: Practical		0	0	4		
CC- 12		C12T: Fisheries Extension, Cooperative and Computer Application	Core Course-12	4	0	0	6	75
		C12P: Practical		0	0	4		
DSE-1		DSE1T: Post Harvest Technology	Discipline Specific Elective -1 (Theory)	4	0	0	6	75
		DSE1P: Practical	Discipline Specific Elective -1 (Practical)	0	0	4		
DSE-2		DSE2T: Quality Assurance of Fishery Products	Discipline Specific Elective -2 (Theory)	4	0	0	6	75
		DSE2P: Practical	Discipline Specific Elective -2 (Practical)	0	0	4		
<b>Semester Total</b>							<b>24</b>	<b>300</b>

**L**= Lecture, **T**= Tutorial, **P** = Practical, **CC** - Core Course, **TBD** - To be decided, **DSE**: Discipline Specific Elective.

## **SEMESTER- V**

### **List of Core Course (CC)**

**CC-11: Fisheries Statistics, Economics and Marketing**

**CC-12: Fisheries Extension, Cooperative and Computer Application**

### **Discipline Specific Electives (DSE)**

**DSE-1: Post Harvest Technology**

**DSE-2: Quality Assurance of Fishery Products**

## Core Course (CC)

**CC-11: Fisheries Statistics, Economics and Marketing**

**Credits 06**

**C11T: Fisheries Statistics, Economics and Marketing**

**Credits 04**

### **Course Contents:**

#### **Unit-I :Fisheries Statistics**

Definition of sample, population in biometry: Frequency distribution, histogram, bar diagram, pie diagram. Measures of central tendencies (Mean, Median and Mode), Dispersion (SD, SE and Variance). Chi square ( $X^2$ ) test and Student's t-test.

#### **Unit-II :Fisheries Economics**

Introduction to fisheries economics, basic economic terminologies – micro and macroeconomics, positive and normative economics, environmental economics. Micro-economics: theories of demand, supply; market – equilibrium price, consumption, utility, Consumer surplus. Elasticity – price, income, cross, application of elasticity in fisheries managerial decision. Farm production economics – production functions in capture and culture fisheries; Costs and returns –breakeven analysis of fish production system; concepts of externalities and social cost factors of production, marginal cost and return, law of diminishing marginal return, economies of scale and scope, profit maximization, farm planning and budgeting.

#### **Unit-III :Marketing Management**

Introduction to marketing management; core marketing concepts: market structure, functions and types, marketing channels and supply chain, marketing margins, marketing environment, marketing strategies, consumer behaviour and marketing research. Fish markets and marketing in India, demand and supply of fish, market structure and price formation in marine and inland fish markets; cold storage and other marketing infrastructure in India; export markets and marketing of fish and fishery products; Trade liberalization and fisheries markets.

**C11P: Fisheries Statistics, Economics and Marketing**

**Credits 02**

### **Course Contents:**

1. Draw a histogram, bar diagram, pie diagram, chart etc
2. Collection of data and presentation of data. Testing of Goodness of fit; Chi square ( $X^2$ ) test and Student's t-test.
3. Developing questionnaire and conducting market surveys, analysis of primary and secondary data.
4. Exercises on equilibrium price for fish and fishery products; estimation of demand and supply using simple regression.

5. Analysis of credit schemes of banks and the government. Case studies of cooperatives.
6. Visit to co-operative societies, commercial banks and fish markets and organizations dealing with marketing of fish and fishery products.

## **CC-12: Fisheries Extension, Cooperative and Computer Application Credits 06**

### **C12T: Fisheries Extension, Cooperative and Computer Application Credits 04**

#### **Course Contents:**

#### **Unit-I :Fisheries Extension**

Introduction to fisheries extension - concepts, objectives and principles of extension. History and role of fisheries extension in fisheries development. Fisheries extension methods- individual, group and mass contact methods and their effectiveness, factors influencing their selection and use; characteristics of technology, transfer of technology process; role of NGOs and SHGs in fisheries; Extension program planning and evaluation - steps and importance; participatory planning process.

#### **Unit-II :Fishery Co-operatives**

Principles and objectives of co-operation, co-operative movement in fisheries in India, structure, functions, status and problems of fisheries co-operatives management. Role of credit for fisheries development, credit requirements of fishers, source and type of credit/finance, micro-credit, indigenous and institutional finance, structure of institutional finance in fisheries; returns, risk bearing ability and recovery in fisheries sector; role of NABARD in fisheries development; role of insurance in fish and shrimp farming and industry.

#### **Unit-III :Computer Application**

Fundamentals computer; hardware and software; input and output devices; Operating systems (OS) - definition, basic concepts, introduction to WINDOWS and LINUX Operating Systems; Local area network (LAN), Wide area network(WAN), Internet and World Wide Web, HTML and IP; Introduction to MS Office - Word, Excel, Power Point.

### **C12P: Fisheries Extension, Cooperative and Computer Application Credits 02**

#### **Course Contents:**

1. Collection of socio-economic data from fishing villages; study of social issues/problems through participatory and rapid rural appraisal techniques, stake holders analysis and needs assessment; assessment of development needs of community and role of formal and non – governmental organizations through stakeholder analysis
2. Case studies on extension programs and Success stories. Practical exercises on conducting fish farmers meet.
3. Analysis of credit schemes of banks and the government.

4. Web Browsing, Creation and operation of Email account
5. Analysis of fisheries data using MS-Excel.
6. Planning, preparation, presentation of posters, charts, overhead transparencies and slides.

### Discipline Specific Elective (DSE)

**DSE-1: Post Harvest Technology:**

**Credits 06**

**DSE1T: Post Harvest Technology      Credits 04**

**Course Contents:**

**Unit-I :Post Harvest Technology**

Introduction to freezing technology; characteristics of fish and shellfish; changes in fish after death, spoilage of fish, spoilage and pathogenic microorganisms; handling of fresh fish; sanitation in processing plants;

**Unit-II :Low Temperature Preservation**

Principles of low temperature preservation. Methods and equipment for chilling; icing – quality of ice, ice making; refrigerated of chilled sea water, chilling rate; spoilage of fish during chilled storage; use of antibiotics and chemicals.

**Unit-III :Packaging Requirements**

Objectives of packaging requirements. Characteristics of various packaging materials – metals, paper and paperboard, corrugated fibre board, plastics, multiplayer and – testing of packaging materials and containers.

**Unit-III :CuringTechnology**

Sun drying, Curing, Wet curing and Smoking. Colombo curing, Artificial drying, Solar drier, Tunnel dryer, Freeze dryer, Water activity and its relation to fish preservation. Fish byproducts and value added products.

**DSE1P: Post Harvest Technology:**

**Credits 02**

**Course Contents:**

1. Sanitation and plant housekeeping; chilling and freezing equipment, instruments; packages and product styles.
2. Methods of icing fish.
3. Preparation of salted fish, dried fish and smoked fish by different methods.
4. Preparation of prawn & fishpickles.
5. Preparation offermented fish sauce and marinated products.
6. Preparation of surimi and surimi based products.

## **DSE-2: Quality Assurance of Fishery Products Credits 06**

**DSE2T: Quality Assurance of Fishery Products**

**Credits 04**

### **Course Contents:**

#### **Unit-I :Quality assurance of fishery products**

Quality dimensions of seafood – sensory, intrinsic, quantitative and affective parameters. Preharvest and post-harvest factors affecting quality. Assessment of quality changes in fresh and iced fish. Quality changes during processing. Importance of quality, definitions and terminologies. Application of HACCP concept in surveillance and quality assurance programmes for raw, frozen, canned, cured, irradiated, cooked and chilled, modified atmosphere packaged and freeze dried products.

#### **Unit-II : Plant Hygiene for fishery products**

Risk assessment, principles of plant hygiene and sanitation, pest control, personnel hygiene, planning and layout, equipment construction and design.

#### **Unit-III : Laws & Standards**

Food laws and standards, national and international legislation, mandatory and non-mandatory standards. Role of export inspection council & export inspection agency and MPEDA in fish and fishery products. Certification system for fish & fishery products. The HACCP for seafood industries and protection of food from adulterants. Standards for sea foods. FSSAI, FDA, ISO. Use of additives in seafood processing as quality enhancers. Seafood safety, authenticity, traceability. Waste management in seafood processing industry.

**DSE2P: Quality Assurance of Fishery Products:**

**Credits 02**

### **Course Contents:**

1. Assessment of quality of fresh fish by sensory, biochemical, and instrumental methods.
2. Chlorination and Hardness estimations.
3. Quality analysis of canned, frozen, cured and pickled fish products.
4. Quality tests for tin and corrugated containers.
5. Quality assessment of salted, dried and smoked fish
6. Assessment of plant, equipment sanitation and personnel hygiene.