



ADIKAVINANNAYAUNIVERSITY::RAJAHMAHENDRAVARAM

B.Voc Industrial Aquaculture & Fisheries Syllabus (w.e.f:2020-21A.B)

B.Voc PROGRAM (4 years Honors)

2020-21 onwards (21jan21)



B. Voc

Industrial Aquaculture & Fisheries

Members of BOS (Contact details)		



ADIKAVINANNAYAUNIVERSITY::RAJAHMAHENDRAVARAM

B.Voc Industrial Aquaculture & Fisheries Syllabus (w.e.f:2020-21A.B)

Skill Enhancement Courses (SECs) for Semester -V,

From 2022-23(Syllabus-Curriculum)

Structure of SECs for Semester-V

(To choose One pair from the Four alternate pairs of SECs)

III Year; Semester V								
S e m	Course no	Course name	Course type (T/L/P)	Hrs/Week (Sciences 4+2)	Credits (Science 4+1)	Each course Evaluation		
						Conti- Assess	Univ- exam	Total
V	1	Zoology (Elective from common B.Sc syllabus) *	T	4	4	25	75	100
	2	Zoology (Elective from common B.Sc syllabus Practical) *	L	2	1	0	50	50
	3	Zoology (Elective from common B.Sc syllabus) *	T	4	4	25	75	100
	4	Zoology (Elective from common B.Sc syllabus Practical) *	L	2	1	0	50	50
	5	Fishery By-Products	T	4	4	25	75	100
	6	Fishery By-Products Practical	L	2	1	0	50	50
	7	Fish Processing Technology and Quality Control	T	4	4	25	75	100
	8	Fish Processing Technology and Quality Control Practical	L	2	1	0	50	50
	9	Aquaculture Engineering	T	4	4	25	75	100
	10	Aquaculture Engineering Practical	L	2	1	0	50	50
	11	Fisheries Management, Economics and Marketing(No Practical)	T	4	4	25	75	100
	12	On Job Training	L	2	1	0	50	50
		Total		36	30			

* Common With B.Sc



SEMESTER V; 2022-2023

PAPER: FISHERY BY-PRODUCTS

(Skill Enhancement Course, 05 Credits)

Max Marks: Theory: 100 + Practical: 50

Credits: 4

Teaching Hours: 4

Learning Outcomes:

Students after successful completion of the course will be able to:

1. Acquire knowledge on value addition in sea foods
2. Understand the production methods of various fish by-products
3. Demonstrate skills for the processing of various fish by-products
4. Know the preparation and advantages of value added fish and shellfish products
5. Understand the spoilage and quality of fish by-products.

Unit 1: Value Addition in Sea Foods

- 1.1 Value addition in sea food. Different types of value added products from fish and shell fish – status of value addition in Indian seafood sector.
- 1.2 Advantages of value addition. Significance of value addition in the seafood industry.

Unit 2: Fish Mince Based Products

- 2.1. Fish mince and Surimi. Production of fish mince – merits and demerits.
- 2.2. Analog and fabricated products. Quality assessment of surimi,.. Equipment, raw material for surimi,
- 2.3. Role of cryoprotectants in surimi production

Unit 3: Coated Fishery Products and Other Value Added Products

- 3.1 Preparation of coated fishery products – Different types of batter and breading and its applications.
- 3.2.Packaging and storing of coated products – Quality evaluation.
- 3.3.Preparation of products viz. fish / prawn pickle, fish wafers, prawn chutney powder, fish soup powder, fish protein hydrolysate, fish stacks, fillets, fish curry, mussel products, marinated products.

Unit 4: Fishery By-Products

- 4.1.Fish meal, fish protein concentrate, shark fin rays, fish maws, isinglass, fish liver oil, fish body oil, fish hydrolysates.
- 4.2. Chitin, chitosan, glucosamine hydrochloride, squalene, pearl essence, ambergris, gelatin, beche-de-mer, fish silage, fish ensilage and seaweed products like agar, alginic acid and carragenan.

Unit 5: Spoilage and quality

- 5.1 Spoilage in thermal processed products – Quality evaluation of thermal processed products.
- 5.2. Curing and drying of fish – Spoilage in dry fish products.



III YEAR; SEMESTER V; 2022-2023
PRACTICAL: FISHERY BY PRODUCTS

Credits :1

Teaching Hours:2

Skills Outcomes:

On successful completion of this practical course, student shall be able to:

1. Execute various techniques of fishery by products preparation.
2. Assess the quality of processed fish and fish by-products.
3. Familiarize with fish packaging materials and containers.
4. Prepare common fish/shellfish by-products and value added products.
5. Improve the business skills in students by the help of fishery food products making.

Experiments:

1. Determination of moisture content in fish and fishery products
2. General description – freezing
3. Processing shrimp
4. Filleting of fish
5. Drying of fish
6. Organoleptic analysis of fish
7. Preparation of fishery by products
8. Preparation of shark fin rays fish maws, chitin, fish wafer
9. Fish pickling
10. Value added fishery products, fish curry, cutlets fish finger.
11. Preparation of surimi

Collection:

1. Collection of fishery by-products

References:

1. Gopakumar K. (2002). Text Book of Fish Processing Technology. ICAR.
2. Govindhan, TK. (1985). Fish processing Technology. Oxford & IBH Publ. Co., New Delhi.
3. Hall, GM. (1992). Fish Processing Technology. Blackie. Springer science and business.
4. Balachandran KK. (2001). Post-harvest Technology of Fish and Fish Products. Daya Publ.
5. Clucas, IJ. (1981). Fish Handling, Preservation and Processing in the Tropics. Parts I, II. FAO
6. Sen, D.P. (2005). Advantages in Fish Processing Technology. Allied publ. Pvt.Ltd. Mumbai
7. Wheaton, FW. and Lawson, TB. (1985). Processing Aquatic Food Products, A Wiley-Inter Science Publication. USA.
8. Ninawe, AS. and RatnaKumar, K. (2008). Fish Processing Technology and Product Development. Narendra Publishing House, Delhi
9. Venugopal V. (2006). Seafood Processing. 1st edition Boca Raton CRC Press.
10. Shahidi, F. and Botta, JR. (1994). Seafoods chemistry, Processing Technology and Quality. Blakie Academic and Professional, U.K.
11. Surendran, PK., Nirmala, T, Narayanan, NV. and Lalitha, KV. (2003). Laboratory Manual on Microbiological Examination of Sea food, CIFT, Cochin.
12. Velayutham, P. and Indira Jasmine, G. (1996). Manual on Fishery By-Products, Tamilnadu



Co-Curricular Activities:

a) Mandatory: (*Training of students by teacher on field related skills: 15 hours*)

1. **For Teacher:** Training of students by teacher in laboratory and field for a total of 15 hours on processing and preservation of fish/shellfish and their by-products and value added products; and the quality management and certification in fish processing.
2. **For Student:** Individual visit to a fish by-products plant or related field or to a laboratory in research organization/private sector and study the various fishery by products preparations.
3. Submission of a hand written Fieldwork Report not exceeding 10 pages in the given format.
4. Max marks for Field Work Report: 05.
5. Suggested Format for Field work: *Title page, student details, content page, introduction, work done, findings, conclusions and acknowledgements.*
6. Unit tests (IE).

b) Suggested Co-Curricular Activities:

1. Training of students by related industrial experts.
2. Assignments (including the preparation of novel value added products and processing of fish products)
3. Seminars, Group discussions, Quiz, Debates, etc. (on related topics).
4. Preparation of videos on fish/shellfish processing and various methods of preserving fish/fish products, preparation of value added products, packaging, labelling, etc,
5. Collection of material/figures/photos related to fish processing, preservation and value added products, writing and organizing them in a systematic way in a file.
6. Visits to fish by products preparation places/industry, firms, research institutes, etc.
7. Invited lectures and presentations on related topics by field/industrial experts.



SEMESTER V; 2022-2023
PAPER TITLE: FISHERY BY-PRODUCTS
MODEL PAPER

Time: 3 Hours

Maximum: 75 Marks

SECTION-A

- I. Answer any FIVE of the following. Draw diagrams wherever necessary.**
5x5=25 M

Draw labeled diagram wherever necessary

1. Surimi
2. Cryoprotectants
3. Advantages of value added products
4. Hydrolysate
5. Types of batter and breading
6. Chitosan
7. Carrageen
8. Curing

SECTION-B

- II. Answer any FIVE of the following. Draw diagrams wherever necessary.**
5x10=50 M

9. a) Explain briefly production of fish mince with merits and demerits
OR
b) Briefly explain quality assessment of surimi
10. a) Explain present status of value addition products in sea foods
OR
b) What is value addition? Explain different types value added products in fishes
11. a) What is coated products ? and preparation of coated fishery products
OR
b) Explain briefly about quality evaluation in packaging and storage of coated products
12. a) Fish meal
b) Fish maws
c) Isinglass
d) Beche-de-mer
e) Fish ensilage
OR
b) Give an account on importance of chitosan and its preparation
13. a) Explain quality assessment in thermal processed products
OR
b) What is curing? Explain role of curing and drying of fish and its products



ADIKAVINANNAYAUNIVERSITY::RAJAHMAHENDRAVARAM

B.Voc Industrial Aquaculture & Fisheries Syllabus (w.e.f:2020-21A.B)

SEMESTER V; 2022-2023

Practical (Skill Enhancement Course)

Fishery By Products

Max. Time : 3 Hours

Max. Marks : 50

1. Major Experiment? 12 M
2. Minor Experiment? 8 M
3. Identification, salient features and ecological importance of the following.
(Spotters /Specimens/ Charts/ Pictures etc choose if anyone from syllabus) 4x5= 20 M
 - a.
 - b.
 - c.
 - d.
4. Record + Viva-voce 6+4 = 10 M

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SEMESTER V; 2022-2023

PAPER: Fish Processing Technology and Quality Control

(Skill Enhancement Course, 05 Credits)

Max Marks: Theory: 100 + Practical: 50

Credits: 4

Teaching Hours: 4

Learning Outcomes:

Students after successful completion of the course will be able to:

1. Acquaint with the handling of fresh fish, and principles of fish processing
2. Understand various methods of fish/shellfish preservation
3. Demonstrate skills for the processing of various fish by-products
4. Know the Packing and labeling, storage and Export of Fishery Products
5. Understand the quality assurance and quality control standards in fish processing plants

Unit 1: Introduction of Fish Processing and Freezing

- 1.1. Introduction of fish processing global supply and demand. Principles of fish preservation- Precautions taken in handling fish in the fishing vessel, landing center and processing plant.
- 1.2. Fundamental principles involved in chilling and freezing of fish and fishery products. Various freezing construction and methods used in shrimps and fishes.
- 1.3. Preservation by refrigerated seawater and chilled sea water.

Unit 2: Preservation techniques of Finfish/Shell Fish processing

- 2.1. Principles of preservative methods - Drying, Salting, Smoking and Canning.
- 2.2. Principles of freeze drying. Accelerated freeze drying and packing of freeze dried products.
- 2.3. Modern methods of preservation by irradiation and modified atmospheric storage.

Unit 3: Packing and labeling, storage and Export of Fishery Products

- 3.1. Packing requirements and regulations. Labeling of fish and fishery products.
- 3.2. Different types of cold storages. Requirements in retail outlet; Insulated and refrigerated vehicles.
- 3.3. Export of fishery products from India – major countries, important products, export documents and procedures.

Unit 4: Quality Assurance

- 4.1 Quality Assurance – Concepts of Hazard Analysis Critical Control Point (HACCP),
- 4.2 Good Manufacturing Practice (GMP), Sanitary Standard Operating Procedure (SSOP).
- 4.3 Determining the quality assurance of sea food.

Unit 5: Quality Control

- 5.1. Quality control – Basic concepts and quality control of fish processing.
- 5.2. Salient features of sea food quality and factors.
- 5.3. Standards of Sea food.



SEMESTER V; 2022-2023

PRACTICAL: Fish Processing Technology and Quality Control

Credits: 1

Teaching Hours: 2

Skills Outcomes:

On successful completion of this practical course, student shall be able to:

1. Execute various techniques of fish preservation.
2. Assess the quality of processed fish and fish by-products.
3. Familiarize with fish packaging materials and containers.
4. Prepare common fish/shellfish by-products and value added products.
5. Assess the sanitation and quality control standards in fish processing plants.

Experiments:

1. Lay – out of processing plant
2. Determination of quality assurance of sea food
3. General description – freezing
4. Canning – Flow chart
5. Smoking – Flow chart
6. Drying – Flow chart
7. Preparation of surimi – Flow chart
8. Collection of Air-bladder
9. Preparation of fishery by products
10. Fish pickling
11. Value added fishery products, fish curry, cutlets, fish finger.

References

1. Fish Processing Technology – T.K.Govindan
2. Fish Processing Technology – Ed. K. Gopakumar
3. Post Harvest Technology – K.K. Balachandran
4. Seafood Processing – V. Venugopal

Supplementary Reading

1. Fish Processing Technology – Ed. G.M. Hall – Chapman & Hall, Madras
2. Tropical Fishery Products – K. Gopakumar



Advanced Reading

1. Kreuzer,R. Fishery Products.

2. Borgstrom,G .Fish as Food

• Co-Curricular Activities:

c) **Mandatory:** (*Training of students by teacher on field related skills: 15 hours*)

1. **For Teacher:** Training of students by teacher in laboratory and field for a total of 15 hours on processing and preservation of fish/shellfish and their by-products and value added products; and the quality management and certification in fish processing.
2. **For Student:** Individual visit to a fish by-products plant or related field or to a laboratory in research organization/private sector and study the various fishery by products preparations.
3. Submission of a hand written Fieldwork Report not exceeding 10 pages in the given format.
4. Max marks for Field Work Report: 05.
5. Suggested Format for Field work: *Title page, student details, content page, introduction, work done, findings, conclusions and acknowledgements.*
6. Unit tests (IE).

d) Suggested Co-Curricular Activities:

1. Training of students by related industrial experts.
2. Assignments (including the preparation of novel value added products and processing of fish products)
3. Seminars, Group discussions, Quiz, Debates, etc. (on related topics).
4. Preparation of videos on fish/shellfish processing and various methods of preserving fish/fish products, preparation of value added products, packaging, labelling, etc,
5. Collection of material/figures/photos related to fish processing, preservation and value added products, writing and organizing them in a systematic way in a file.
6. Visits to fish by products preparation places/industry, firms, research institutes, etc.
7. Invited lectures and presentations on related topics by field/industrial experts.



SEMESTER V; 2022-2023

**PAPER TITLE: FISH PROCESSING TECHNOLOGY AND QUALITY CONTROL
MODEL PAPER**

Time: 3 Hours

Maximum: 75 Marks

SECTION-A

- I. Answer any FIVE of the following. Draw diagrams wherever necessary.**
5x5=25 M

Draw labeled diagram wherever necessary

1. Landing centers
2. RSW
3. Blast freezers
4. Canning
5. MAP
6. Packing materials
7. HACCP and GMP
8. Butterfly cut

SECTION-B

- II. Answer any FIVE of the following. Draw diagrams wherever necessary.**
5x10=50 M

9. a) What is processing ? Principals involved in processing technology.

OR

b) What are the types refrigerated waters ? Explain briefly about CSW.

10. a) Explain different types preservative methods.

OR

b) Explain modern methods of preservation?

11. a) Explain material required for packing and its labeling.

OR

b) Explain the purpose of cold storage? And its requirements

12. a) Determine the quality assurance of sea foods.

OR

b) Explain briefly about methods and steps of quality of assurance.

13. a) Explain basics concepts and quality control of fish processing.

OR

b) Explain salient features of sea food quality and its factors?



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B.Voc Industrial Aquaculture & Fisheries Syllabus (w.e.f:2020-21A.B)

SEMESTER V; 2022-2023

Practical (Skill Enhancement Course)

Fish processing technology and quality control

Max. Time : 3 Hours

Max. Marks : 50

- | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| 1. Major Experiment? | 12 M |
| 2. Minor Experiment? | 8 M |
| 3. Identification, salient features and ecological importance of the following.
(Spotters /Specimens/ Charts/ Pictures etc choose if anyone from syllabus) | 4x5= 20 M |
| a. | |
| b. | |
| c. | |
| d. | |
| 4. Record + Viva-voce | 6+4 = 10 M |

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SEMESTER V; 2022-2023

PAPER: AQUACULTURE ENGINEERING

(Skill Enhancement Course, 05 Credits)

Max Marks: Theory: 100 + Practical: 50

Credits: 4

Teaching Hours: 4

Learning Outcomes:

Students after successful completion of the course will be able to:

1. Acquaint Aquaculture engineering.
2. Understand Design and Construction of Aquaculture Facilities
3. Demonstrate skills for Water Transport, Water quality and water treatment
4. Know the Aeration and oxygenation methods in culture ponds
5. Understand the Recirculation Aquaculture System

Unit 1: Introduction

- 1.1. Introduction of Aquaculture engineering.
- 1.2. The farm; Technical components in a system- Land based hatchery and juvenile production farm; on growing sea cage farm.
- 1.3. Future trends and increased importance of aquaculture engineering.

Unit 2: Planning Aquaculture facilities

- 2.1. Introduction - Planning process, site selection, production plan, room programme and necessary analysis.
- 2.2. Drawing up alternative solutions, evaluation of and choosing alternative solutions, Finishing plans, detailed planning, Function test of the plant.
- 2.3. Design and Construction of Aquaculture Facilities – Introduction, Land-based hatchery, juvenile and on-growing production plant.

Unit 3: Water Transport, Water quality and water treatment

- 3.1. Introduction – Pipe and pipe parts; Water flow and head loss in channels and pipe systems.
- 3.2. Pumps – Types of pumps; Pumping of water requires energy; Centrifugal and propeller pumps; Changing of water flow o pressure; Regulation of flow from selected pumps.
- 3.3. Increased focus on water quality; Inlet water; Outlet water; water treatment.

Unit 4: Aeration and oxygenation

- 4.1. Design and construction of aerators – Basic principles; Evaluation criteria; Example of designs for different types of aerator; Oxygenation of water.
- 4.2. Instruments– Construction of measuring instruments, Measuring water quality; measuring physical conditions; counting fish; measuring fish size and total fish biomass.

Unit 5: Recirculation Aquaculture System

- 5.1. Recirculation Aquaculture systems – Advantages and disadvantages of RAS,
- 5.2. Definitions – Degree of Recirculation; water exchange in relation to amount of fish.
- 5.3. Degree of purification. Components in a RAS; Design of a RAS.



SEMESTER V; 2022-2023

PRACTICAL: AQUACULTURE ENGINEERING

Credits: 1

Teaching Hours: 2

Skills Outcomes:

On successful completion of this practical course, student shall be able to:

1. Execute various Layout of fish farm, Design Dike, Monk and Bundh preparation.
2. Acquire knowledge in Automatic feed distribution and surface aerator.
3. Familiarize with fish packaging materials and containers.
4. Know the Design of Recirculating Aquaculture System (RAS)
5. Improve the Engineering skills culture pond constructions and maintenance.

Syllabus

- i) Lay-out of fish farm
- ii) Lay-out of hatchery
 - a. Dike design
 - b. Design of monk
 - c. Design of Bundh
 - d. Design of Sluice gate
 - e. Various types of surface aerator
 - a. Automatic feed distribution
 - b. Major components in a land-based hatchery and juvenile production plant
 - c. Different ways to prepare a connection analysis.
 - d. The inlet grating can (A) be made self-cleaning, or (B) placed within the pumping station so that it is close to the surface and easily available for cleaning.
 - e. Design of Recirculating Aquaculture System (RAS)
 1. A centralized RAS serving several fish tanks.
 2. Two designs of tank internal RAS serving only one tank

References

1. R. Ramachandran Nair Encyclopedia of fish disease –
2. K.P. Biswas Prevention and control of fish and Prawn diseases –
3. B.K. Mishra, P. Swain, P.K.Sahoo, B.K.Das, N.Sarangi. Disease management in FW Pisciculture –
4. Wheaton, F.W. Aquacultural Engineering
5. Bose et al. Coastal Aquacultural Engineering

Supplementary Reading

1. Sinderman C.J. Principle diseases of Marine fish and shell fish
2. Schaperclaus Fish Disease.



Advanced Reading

1. Roberts R.J.Fish Pathology..
2. Post, G. Text Book of Fish Health.

Co-Curricular Activities:

a) Mandatory: (*Training of students by teacher on field related skills: 15 hours*)

1. **For Teacher:** Training of students by teacher in laboratory and field for a total of 15 hours on Layout of fish farm, Design Dike, Monk and Bundh preparation.
2. **For Student:** Individual visit to a fish farms or related field or to a laboratory in research organization/private sector and study the various aquaculture engineering techniques.
3. Submission of a hand written Fieldwork Report not exceeding 10 pages in the given format.
4. Max marks for Field Work Report: 05.
5. Suggested Format for Field work: *Title page, student details, content page, introduction, work done, findings, conclusions and acknowledgements.*
6. Unit tests (IE).

b) Suggested Co-Curricular Activities:

1. Training of students by related industrial experts.
2. Assignments (including the preparation of novel value added products and processing of fish products)
3. Seminars, Group discussions, Quiz, Debates, etc. (on related topics).
4. Preparation of videos on fish/shellfish pond construction and observe the different parts measurements and located places .



SEMESTER V; 2022-2023
PAPER: AQUACULTURE ENGINEERING
MODEL PAPER

Time: 3 Hours

Maximum: 75 Marks

SECTION-A

I. Answer any FIVE of the following. Draw diagrams wherever necessary.

5x5=25 M

Draw labeled diagram wherever necessary

1. Land based hatchery
2. On-growing production plant
3. Types of pumps
4. Types of aerator
5. RAS
6. Aquaculture facilities
7. Construction of aerators
8. Components in a RAS

SECTION-B

II. Answer any FIVE of the following. Draw diagrams wherever necessary.

5x10=50 M

9. a) Describe the Future trends and increased importance of aquaculture engineering.

OR

b) Explain Technical components in a system.

10. a) Write about Design and Construction of Aquaculture Facilities?

OR

b) Describe the Drawing up alternative solutions in Aquaculture planning.

11. a) Write about Water Transport facilities Aquaculture Engineering?

OR

b) Explain the Water quality and water treatment procedures?

12. a) Explain the basic principles and evaluation criteria for aerators.

OR

b) Describe the Measuring water quality and counting fish.

13. a) Explain the Advantages and disadvantages of RAS?

OR

b) Write an essay on Design of Recirculation Aquaculture systems.



ADIKAVINANNAYAUNIVERSITY::RAJAHMAHENDRAVARAM

B.Voc Industrial Aquaculture & Fisheries Syllabus (w.e.f:2020-21A.B)

SEMESTER V; 2022-2023

Practical (Skill Enhancement Course)

Aquaculture Engineering

Max. Time : 3 Hours

Max. Marks : 50

1. Major Experiment? 12 M
2. Minor Experiment? 8 M
3. Identification, salient features and ecological importance of the following.
(Spotters /Specimens/ Charts/ Pictures etc choose if anyone from syllabus) 4x5= 20 M
 - a.
 - b.
 - c.
 - d.
4. Record + Viva-voce 6+4 = 10 M

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SEMESTER V; 2022-2023

PAPER: FISHERIES MANAGEMENT, ECONOMICS AND MARKETING

(Skill Enhancement Course, 05 Credits)

Max Marks: Theory: 100 + OJT: 50

Credits: 4

Teaching Hours: 4

Learning Outcomes:

Students after successful completion of the course will be able to:

1. Understand the concept of human resource management in aquaculture
2. Understand the concept of aquaculture economics and farm planning and budgeting.
3. Know the economic principles applied to aquaculture production.
4. Familiarize with the concepts of marketing and export of fish and fishery products
5. Assess the socio-economic conditions of fishermen and fish farmers and know the financial support they are getting from central and state government agencies.
6. Understand the global trade of fish and fish products and their contribution to Indian economy.

Unit 1: Introduction of Management, Human resource Management and Economics

- 1.1 Definitions and approaches, Scope and importance of Management Comparative Management.
- 1.2 Functions of Managers- Planning, Organising, Staffing, Directing and Controlling. Contributions of Henry Fayol to the Scientific Techniques of management.
- 1.3 Manpower planning and recruitment- Organisational Development- Training, Motivation, Leadership, Organizational communication, Conflicts and Decision making.
- 1.4 Human resource development and its role in the context of fisheries sector. Important Institutions involved in human resource development in Fisheries sector.
- 1.5. Introduction, fisheries economic definition, objectives, different types of economics. Micro economics and Macro economics and its importance.
- 1.5 Demand and supply, types of demand, factors affecting demand

Unit 2: Co-operation, Fishery Co-operatives and Rural Development

- 2.1. Definition, Principles of cooperation, National Federation of Fishermen's Cooperatives (FISHCOPFED); NCDC.
- 2.2. Status of Indian fishery co-operative movement; programmes for fisheries development.
- 2.3. Reasons for failure of fishermen co-operative society; Suggestions for the improvement of fisheries co-operatives

Unit 3: Marketing and Export Inspection Council

- 3.1. Introduction, Components of market; Classification of markets;
- 3.2. Marketing institutions- MPEDA; Fisheries cooperative societies, Factors affecting length of marketing channels, Types of market information.
- 3.3. MPEDA, Structure, activities and network, Objectives, Marketing services, financial services, statistics and market research, Research and product development, Export Inspection council, systems of inspection.



Unit 4: Role of Financial Institutions, Socio-Economics & Trade organisation

- 4.1. Role of financial Institutions in fisheries-Introduction, classification of source of finance, RBI, World Bank, IBRD, IDP, IFC, MIGA, ICSID, NABARD.
- 4.2. Fisheries Socio-Economics- Introduction; Socio-economics aspects of fishermen; Socio-economic study; Characteristics of a good sample design; Survey schedule on the socio-economic status of fisher folk.
- 4.3. The world trade organization-Introduction; Agreement on technical barriers to trade (TT); Balance of payments; Anti dumping; Tariffs; Quotas; Tariff quota; MFN; Trade Arrangements and Trade Blocs.

Unit 5: Projects-Concept and Scope, Fisheries Acts

- 5.1. Introduction, Project cycles, Aquaculture Projects Planning. Stage of planning and formulation –project identification and project design , Organisational setup in processing Industries
- 5.2. Project implementation.
- 5.3. Analysis of expected results and appraisal preparation of project report
- 5.4. Indian fisheries Act, National Institutions of Governance in Marine affairs of India- Criteria for regulation of Fishing effort. Code of conduct for responsible fisheries, Important acts pertaining to fisheries in Andhra Pradesh - Marine Fisheries Act.



SEMESTER V; 2022-2023
OJT (ON THE JOB TRAINING)

Credits: 1

Teaching Hours: 2

Skills Outcomes:

On successful completion of this practical course, student shall be able to:

1. Prepare the project proposal and project appraisal
2. Assess the cost benefit analysis of fish/shellfish production units.
3. Execute the questionnaires for market surveys and socio-economics of farmers.
4. Analyze the socio-economic conditions of fishermen and fish farmers and the role of cooperative societies.
5. Know the International trade of fish and fishery products and contribution of fisheries to Indian economy.

CONTENT	EVALUATION	MARKS
FIELD TRIPS	3X5	15
PROJECT /INDUSTRIAL OR INSTITUTE TRAINING REPORT & SEMINAR	15+5	20
FIELD COMPONENTS	10X1	10
VIVA VOCE	-	05
TOTAL		50

References:

1. Shang YC. (1990). Aquaculture Economic Analysis–An Introduction. World Aquaculture Society, USA.
2. Singh, R.K.P. (2003). Economics of Aquaculture. Daya Publishing House, Delhi.
3. Jayaraman, R. (1996). Fisheries Economics. Tamilnadu Veterinary and Animal Science University, Tuticorin.
4. Allen, et al.(Eds). (1984). Bio-Economics of Aquaculture. Elsevier Publ.
5. Chaston I. (1987). Business Management in Fisheries and Aquaculture.Fishing News Books
6. Tripathi SD (1992). Aquaculture Economics. Asian Fisheries Society, Mangalore
7. Subba Rao N (1986). Economics of Fisheries. Daya publishing house, Delhi
8. Ian C. (1984). Marketing in Fisheries and Aquaculture. Fishing News Books.
9. Korakandy, R (1996). Economics of Fisheries Management.DayaPublishing House, Delhi
10. Dewett, K.K. and Varma, J.D. (1993). Elementary Economic Theory. S.Chand, New Delhi.
11. Sathaidhas, R. (1997). Production & Marketing Management of Marine Fisheries in India. Daya Publishing House, Delhi.
12. Kotler, Philip. (1995). Principles of Marketing. Prentice-Hall of India, New Delhi.
13. *Web resources suggested by the teacher concerned and the college librarian including reading material.*



. Co-Curricular Activities:

a) Mandatory: (*Training of students by teacher on field related skills: 15 hours*)

1. **For Teacher:** Training of students by teacher in laboratory and field for a total of 15 hours on the principles of economics; preparation of project proposals and credit schemes; Cost-benefit analysis of fish/shellfish production farms and hatcheries; fish markets and marketing economics; organizing and conducting socio-economic surveys to study the socio-economic status of fishermen and fish farmers; and fish cooperative societies.
2. **For Student:** Individual visit to commercial fish and shellfish farms/hatcheries to study the cost-benefit analysis, commercial banks and regional rural banks for credit schemes, fish markets to study the marketing of fish and fish products, co-operative societies, government agencies and fish export organizations. Develop advertisement skills for marketing of various products used for Aquaculture. Submission of a hand written Fieldwork Report not exceeding 10 pages in the given format.
3. Max marks for Field Work Report: 05
4. Suggested Format for Field Report: *Title page, student details, content page, introduction, work done, findings, conclusions and acknowledgements.*
5. Unit tests (IE).

b) Suggested Co-Curricular Activities:

1. Training of students by related industrial experts.
2. Assignments (including technical assignments on farm economics and marketing management of fish and fish products).
3. Seminars, Group discussions, Quiz, Debates, etc. (on related topics).
4. Preparation of videos on fish/shellfish markets and marketing process.
5. Collection of material/figures/photos related to the topic, writing and organizing them in a systematic way in a file.
6. Visits to fish/shellfish farms and hatcheries, fish markets, fish co-operative societies, etc.
7. Invited lectures and presentations on related topics by field/industrial experts.



SECTION-A

I. Answer any FIVE of the following. Draw diagrams wherever necessary.
5x5=25 M

Draw labeled diagram wherever necessary

1. Importance of comparative management
2. Different types of economics
3. Motivation
4. Fisheries cooperative societies
5. NCDC
6. MPEDA
7. NABARD
8. Project cycles

SECTION-B

II. Answer any FIVE of the following. Draw diagrams wherever necessary.
5x10=50 M

9. a) What is Management? Explain scope and importance of management?

OR

b) Give the definition of fisheries economics? Write the objectives and types of economics?

10. a) Write about National Federation of Fishermen's Cooperatives (FISHCOPFED)?

OR

b) Definition, Principles of cooperation? Explain the Reasons for failure of fishermen co-operative society

11.a) Write the classification of markets and explain the components of market

OR

b) Give a detail notes on marketing institutions related to fisheries sectors?

12. a) Explain the role of financial Institutions in fisheries?

OR

b) What is WTO? Explain the role and importance fisheries sector?

13. a) Explain the Project implementation?

OR

b) Write about organization setup in processing industries?



ADIKAVINANNAYAUNIVERSITY::RAJAHMAHENDRAVARAM

B.Voc Industrial Aquaculture & Fisheries Syllabus (w.e.f:2020-21A.B)

SEMESTER V; 2022-2023
OJT (ON JOB TRAINING)
MODEL PAPER

Max. Time : 3 Hours

Max. Marks : 50

CONTENT	EVALUATION	MARKS
FIELD TRIPS	3X5	15
PROJECT REPOT/ INDUSTRIAL OR INSTITUTE TRAINING& SEMINAR	15+5	20
FIELD COMPONENTS	10X1	10
VIVA VOCE	-	05
TOTAL		50