

SACRED HEART COLLEGE (AUTONOMOUS)

Department of Aquaculture

Master of Aquaculture and Fish Processing

Course plan

Academic Year 2016 - 17

Semester 3

SACRED HEART COLLEGE THEVARA, KOCHI

Course Plan –Post Graduate Programme 2016

Programme :M.Sc Branch : aquaculture and Fish Processing

Semester : III Course Code : ACT 301

Course Title : Culture of Finfishes, Mollusc ,and Seacucumbers

Term -1 (Before I Internal Test)

Sl.No.	TOPIC/ MODULE	No. of hours	Method of Teaching	Teacher / Invited Persons
	Module I Fin fish culture	40hrs		
1	Overview of fin fish culture the world – major species cultured, country-wise production.	3	Lectures , Assignments	Litty Mary
2	Fin fish culture in India- historical background and advances	3	“	“
3	Marine, brackish water and fresh water species cultured.	3	Lectures , Assignments	Litty Mary
4	Characteristics and criteria for selection of species for mariculture.	3	“	“
5	Seed production, natural seed resources, their distribution, abundance collection and transportation.	4.5	“	“
6	Hatchery technology, brood stock management	4.5	“	“

7	and breeding under controlled conditions. Induced breeding, egg incubation, larval rearing, and production of seed, nursery phase	3.5	“	“
8	Different kinds of grow out culture systems, their advantages and disadvantages.	4.5	Lectures , Assignments	Litty Mary
9	Traditional and improvement farming practices.	3	“	“
10	Operational details of monoculture and polyculture.	3	“	“
11	Fin fish culture in pens and cages, raceways, running water systems.	3	“	“
12	Sea ranching of fin fish, integrated farming.	2	“	“
Term –II (40 % of Syllabus)				
	Module II Sea cucumber culture	10hrs		
13	Present status of sea cucumber culture in the world.	1	Lectures , Assignments	Litty Mary
14	Natural resources and recent advances in breeding. Seed production.	3.5	“	“
15	Culture and conservation of cucumbers in India.	2	“	“

16	Processing of sea cucumber	3.5	“	“
17	Module III Mollusc cultur Overview of culture of Moll in the world.	40hrs 1	Lectures , Assignments	Litty Mary
18	Major species of oysters, mu clams, cockles, scallops, gastropods in aquaculture.	5	“	“
19	Culture systems and princip Modern development , their distribution and abundance, collection techniques	5	Lectures , Assignments	Litty Mary
Term –III (remaining 30 %) (before the model exam)				
20	Hatchery production of seed brood stock management,	3.5	Lectures , Assignments	Litty Mary “
21	Induced maturation and spa larval rearing techniques.	3.5	“	“
22	Spat settlement and spat collection.	2	“	“
23	Water quality, disease contr transportation of seed.	2.5	“	“
24	Oyster farming-site selection farm structure, farming techniques monitoring grow condition index.	3.5	Lectures , Assignments “	Litty Mary “
25	Control of predators and harvesting of edible oyster a pearl oysters.	2.5	“	“

26	Techniques of Mabe or image pearl production, pearl sac tissue and pearl production.	2.5	Lectures , Assignment	Litty Mary
27	Biofouling in oyster farms and control measures.	1	Lectures , Assignments	Litty Mary
28	Mussel culture methods. Harvesting methods and sea ranching .	3	“	“
29	Abalone culture.	3	“	“
30	Depuration of bivalves, principles and methods.	2	“	“

Assignment.

1. Pearl production in molluscs.
2. Overview of fin fish culture in India.
3. Major bivalve molluscs utilized for aquaculture.
4. Processing of sea cucumbers.
5. Culture of Mullet.
6. Breeding of fish under control condition.
7. Pearl oyster aquaculture.
8. Disease encountered in mussel farming.
9. Cage culture.
10. Species diversification in aquaculture and its implications.
11. Recent advances in fin fish culture.
12. Practices, problems and prospects in sea cucumber culture

SACRED HEART COLLEGE THEVARA, KOCHI

Course Plan –Post Graduate Programme

Programme :M.Sc Branch : aquaculture and Fish Processing 2016

Semester : III Course Code : ACT 302

Course Title : Aquariculture , Aquaculture Economics and Administration

Term -1 (Before I Internal Test)

Sl.No.	TOPIC/ MODULE	No. of hours	Method of Teaching	Teacher / Invited Persons
1	Module I. Construction and maintenance of aquarium.	10	Lectures , Assignments And Seminars	Dr. Anna Mercy
2	Module III. Economics. Application of production economics in aquaculture. Law of diminishing returns; definition and application, marginal analysis-total products, average product, marginal product curves and formulae.Producer decision criteria	5	Lectures , Assignments And Seminars	Joseph James
3	Module IV Aquaculture management. Management of hatcheries and farms.	4	Lectures , Assignments And Seminars	Dr.V.C. George

	Availability of manpower and skilled labour in India			
Term –II (40 % of Syllabus)				
4	<p>Module II. Culture of aquarium fishes and management.</p> <p>Fresh water aquarium fish culture. Marine aquarium fish culture. Marine ornamental fishes and ornamental invertebrates.</p> <p>Breeding of Gold fish, Koi, Angel fish, barb, Fighter, Gourami ,Livebearers, clown fish, Damsels, Butterfly fish, Seahorse.</p>	15hrs.	Lectures , Assignments And Seminars	Dr. Anna Mercy
5	<p>Module III. Economics</p> <p>Profit maximisation.</p> <p>Cost fractions- determining maximum profit level of production, opportunity costs, fixed costs, variable costs, full costs, revenue function, total average marginal- production function in aquaculture. Investment financial planning and market analysis; investment-definition, autonomous and induced investment; choice and formulation of</p>	10	Lectures , Assignments And Seminars	Joseph James

	aquaculture investment projects, factors influencing investments and decisions, enterprise budget and partial for aquaculture enterprises			
6	<p>Module IV Aquaculture management.</p> <p>Personal requirements and management. Material management. Financial management. Poaching and natural calamities. Water quality control for hatcheries and farms.</p>	4	<p>Lectures , Assignments And Seminars</p>	Dr.V.C. George
Term –III (remaining 30 %) (before the model exam)				
7	<p>Module II. Culture of aquarium fishes and management.</p> <p>Bulk production of ornamental fishes Nutrition and feeds of aquarium fishes. Establishment of a commercial ornamental fish culture unit. Common diseases of aquarium fishes and management.</p>	15	<p>Lectures , Assignments And Seminars</p>	Dr.Anna Mercy

8	Module III. Economics Income cash flow and statements. Ration analysis; supply and demand functions for aquaculture products. Consumer surveys for aquaculture products; market analysis and questionnaire design.	5	Lectures , Assignments And Seminars	Joseph James
9	Module IV Aquaculture management. Criteria and nature of data input needed for preparation of feasibility reports on hatcheries and on fish feed mill.	4	Lectures , Assignments And Seminars	Dr.V.C. George

Assignments

1. Common diseases of aquarium fishes and management.
2. Breeding of gold fish
3. Breeding of angel fish
4. Breeding of live bearers
5. Breeding of cichlids
6. Setting up of an aquarium
7. Breeding of clown fish
8. Breeding of damsels
9. Breeding of butterfly fish
10. Water quality control for hatcheries and farms.
11. Supply and demand functions for aquaculture products.

12. Establishment of a commercial ornamental fish culture unit.

SACRED HEART COLLEGE THEVARA, KOCHI

Course Plan –Post Graduate Programme

Programme :M.Sc Branch : Aquaculture and Fish Processing 2016

Semester : III Course Code : ACT 303

Course Title : Culture of crustaceans, sea weeds and fisheries technology

Term -1 (Before I Internal Test)

Sl.No.	TOPIC/ MODULE	No. of hours	Method of Teaching	Teacher / Invited Persons
1	Module I Crustacean culture Overview of crustacean culture in the world. Major species cultured, technologies and problems of crustacean culture in India. Historical background and recent advances; species cultured, potential species and characteristics of their suitability for aquaculture	12	Lectures , Assignments And Seminars	Sangeetha K.R.
2	Module II Sea weed culture	10		

	Taxonomy of economic seaweeds, seaweed morphology, reproduction and life cycle; growth of seaweeds and factors affecting it.		Lectures , Assignments And Seminars	Sangeetha K.R.
3	Module III Fisheries Technology Microbes causing food spoilage,pathogenic organisms like Vibrio cholera .Salmonella ,Staphylococcus aureus	2	Lectures , Assignments And Seminars	Dr.S.Sanjeev
4	Module III Fisheries Technology Different methods of production of ice. Storage calculation or requirements of ice, storage of fish in ice	3	Lectures , Assignments And Seminars	Dr. Jose Joseph
Term –II (40 % of Syllabus)				
5	Module I Crustacean culture Shrimp/prawn seed production-natural seed resources, their distribution and abundance, collection and transportation, hatchery	15	Lectures , Assignments And Seminars	Sangeetha K.R.

	<p>production of seed, brood stock management and breeding under controlled conditions, larval rearing techniques and mass production of seed.</p> <p>Recent advances in seed production technology for crabs and lobsters, nursery phase</p>			
6	<p>Module II Sea weed culture</p> <p>Seaweed culture in India-site selection, determining growth pattern and environmental monitoring; causes of mortality; small scale and commercial scale culture operations.</p>	10	<p>Lectures , Assignments And Seminars</p>	Sangeetha K.R.
7	<p>Module III Fisheries Technology</p> <p>Microbial analysis of food production and identification of different microbes of public health significance</p>	6	<p>Lectures , Assignments And Seminars</p>	Dr.S.Sanjeev

8	<p>Module III Fisheries Technology</p> <p>Different types of freezing methods like air blast freezing ,plate freezing and cryogenic freezing curve. Flow chart grading ,packing and storage of frozen products. Drip loss and thawing of frozen fish ,changes during frozen storage</p>	5	<p>Lectures , Assignments And Seminars</p>	Dr. Jose Joseph
Term –III (remaining 30 %) (before the model exam)				
9	<p>Module I Crustacean culture</p> <p>Different kinds of grow out culture systems, traditional prawn culture practices and modern farming techniques; extensive, semi-intensive, intensive and super intensive shrimp farming, cages, pens and recirculating systems. Sea ranching of prawns..</p> <p>Culture practices and potentials for crabs and lobsters.</p>	13	<p>Lectures , Assignments And Seminars</p>	Sangeetha K.R.

10	<p>Module II Sea weed culture</p> <p>Utilization of seaweeds; post – harvest technology of cleaning, washing and storage; chemical composition of seaweed; processing and extraction of algin, alginic acid and alginates, processing and extraction of agar , mannitol and carrageen</p>	5	<p>Lectures , Assignments And Seminars</p>	Sangeetha K.R.
11	<p>Module III Fisheries Technology</p> <p>Spoilage microorganisms of fish and fishery products .Psychrophilic and mesophilic microbes in processed fish and fishery products</p>	6	<p>Lectures , Assignments And Seminars</p>	Dr.S.Sanjeev
12	<p>Module III Fisheries Technology</p> <p>Different value added products like fish finger, flakes ,soup powder ,battered and breaded products and minced products</p> <p>Transportation of fresh fish</p>	3	<p>Lectures , Assignments And Seminars</p>	Dr. Jose Joseph

1. Crab fattening
2. Viral diseases affecting cultured shrimp
3. Cage culture of shrimp
4. Criteria for selection of potential species for culture
5. Components of fresh water prawn hatchery
6. Onboard handling of fish
7. Working of vapour compression system of refrigeration
8. Optimum water quality management in prawn farms
9. Biochemical composition of seaweeds
10. General characters of class Chlorophyceae
11. Transportation of prawn larvae
12. Eye stalk ablation techniques

References

Module I

1. MPEDA .Hand book on Aqua Farming Indian lobsters
2. MPEDA .Hand book on Aqua Farming seaweeds ,seurchins ,seacucumbers
3. Hand book of Fisheries and Aquaculture , Published by ICAR ,S,Ayyappan
4. CMFRI Bulletin 28 -Larval Development of Indian Penaeid prawn
5. TVR.Pillai and A.N. Kutty(1988) Aquaculture in Principles and practices, Fishing News Book
6. Manual on shrimp farming published by MPEDA

Module II

1. CMFRI Bulletin –Sea weed Culture and Utilization

2. TVR.Pillai and A.N. Kutty(1988) Aquaculture in Principles and practices, Fishing News Book
3. Hand book of Fisheries and Aquaculture , Published by ICAR ,S,Ayyappan
4. TakecImain(1977) aquaculture in shallow seas,Progress in shallow sea culture Amerind publication pvt.Ltd NewDelhi

Module III

1. Bonne ell ,A.D.(1994) Quality Assurance in seafood processing ,Chapman and Hall,USA
2. T.S.GopalakrishnaIyer ,Kandoran .M.K. ,Mary Thomas and Mathew P.T. (2000) Quality assurance in seafood processing CIFt
3. Devadasan.K., Mukundan ,M.K. Antony P.D. and Jose Joseph (1974) Nutrients and Bioactive substances in Aquatic organisms SOFT(1)

Module IV

1. Wheaton F.M. and Lawson T.B.1985 processing of aquatic products ,Wiley abnf Interscience publishers
2. Balachandran .K.K. (2001) Post harvest Technology of Fish and Fishery Products ,Daya pub House ,Delhi
3. Gopakumar,K(1997) Tropical Fisheruy Products ,New York ,ICAR