

# **SACRED HEART COLLEGE (AUTONOMOUS)**

**Department of Aquaculture**

**Master of Aquaculture and Fish Processing**

**Course plan**

**Academic Year 2015 - 16**

**Semester 4**

**SACRED HEART COLLEGE THEVARA, KOCHI**

**Course Plan –Post Graduate Programme 2015**

**Programme: M.Sc. Aquaculture and Fish Processing**

**Semester: SEMESTER IV-ACT401: Fishing Technology**

Term – I (Before I Internal tests) – 30 % of the syllabus					
Sl No	Topic/Module	Hour/ session	Teacher/invited persons etc.	Method of teaching	Remarks: Books, reference etc
	<b>Module I Fishing crafts.</b>	<b>20</b>	Dr.V.C.George	Lecture method (conventional)	1. John C. Sainsbury (1971) – Commercial fishing methods- an introduction to vessels & gears  2. M. Shahul Hameed (2000) & Boopendranath - Modern fishing gear Technology  3. Advances in harvest technology (2003). Winter school manual- ICAR CIFT
1.	Types of fishing crafts: traditional and motorized	5	“		
2.	Different types in India and principles of operation.	5	“		
3.	Outline of the method of construction of fishing boats in wood, fiber glass and Ferro cement and steel.	10	“		
	<b>Module II Marine Fouling</b>	<b>7</b>			
4.	Marine Fouling:	2			
5.	Painting schedule	2			
6.	Maintenance of fishing boats.	3			

	Term – II – 40 % of the syllabus ( before the second Internal tests)
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	Topic/Module	Hour/ session	Teacher/invited persons etc.	Method of teaching *	Remarks: Books, reference etc
	<b>Module II</b>	<b>13</b>		Lecture method (conventional)	
5.	Classification of corrosion	4	Dr.V.C.George		1. Advances in harvest technology (2003). Winter school manual- ICAR CIFT
6.	Marine corrosion and its control	4	"		2. K.P. Biswas (1990) a text book of fish, fisheries and Technology
7.	Recent advances in fishing craft technology.	5	"		
	<b>Module III Fishing Gear</b>	<b>23</b>			
8.	Classification of fishing gear system	6	"		3. John C. Sainsbury (1971) – Commercial fishing methods- an introduction to vessels & gears
9.	Fishing gear materials and their properties.	5	"		
10.	Estimation of weight of netting.	5	"		
11.	Basic principles of gear design and capture mechanism.	4	"		
12.	Fishing gear for closed water systems.	3	"		

\*ICT enabled, Lecture method (conventional)

Term – III – 30 % of the syllabus (before the model examination)					
Sl No	Topic/Module	Hour/ session	Teacher/invited persons etc.	Method of teaching *	Remarks: Books, reference etc.
	<b>Module III</b>	<b>7</b>	Dr.V.C.George	Lecture method (conventional)	
13.	Gill nets	2	"		1. Fridman A..L. (1973)- Theory & design of commercial fishing gear
14.	cast nets	1	"		
15.	Trammel net	1	"		2. Brandt A.V. (1984). Fish catching Methods of the world
16.	drag net	1	"		
17.	shore seines	1	"		3. John Garner (1957) How to make and set nets
18.	light fishing	1	"		
	<b>Module IV Low energy fishing</b>	<b>10</b>			
\19.	Low energy fishing	1	Dr.V.C.George		
20.	Hooks and Lines	2	"		
21.	gillnets and Tangle nets	2	"		
22.	cast nets	1	"		
23.	Trammel nets	1	"		
	Responsible fishing: IUU				

24.	Bycatch reduction	1	"		
25.		1	"		
26.	Turtle Exclusion Device.	1	"		
	<b>Module V Basic Principles of Navigation</b>	<b>10</b>			
27.	Basic principles of navigation.	2	Dr.V.C.George		
28.	Fish finding devices-conventional and modern fish aggregation devices	4	"		
29.	Recent advance in fishing gear technology.	4	"		

\*ICT enabled, Lecture method (conventional)

### Assignments

1. Bycatch reduction devices
2. Recent advances in fish craft technology
3. Different fish finding equipments
4. Difference between gillnets & trammel nets
5. Different types of FAD's
6. Cast nets
7. Modern fish finding devices
8. Responsible fishing in India
9. Navigation equipments
10. Disadvantages of bottom trawling in India
11. Different between trawling & trolling
12. Gillnets Of India

**Course Plan –Post Graduate Programme 2015**

**Programme: M.Sc. Aquaculture and Fish Processing**

**Semester: SEMESTER IV-ACT402: Fish Processing Technology**

<b>Term – I (Before I Internal tests) – 30 % of the syllabus</b>					
<b>Sl No</b>	<b>Topic/Module</b>	<b>Hour/ session</b>	<b>Teacher/invited persons etc.</b>	<b>Method of teaching</b>	<b>Remarks: Books, reference etc</b>
	<b>Module I Freezing technology of fish</b>	<b>10</b>		Lecture method (conventional)	
1.	Fundamentals of fish biochemistry	3	Dr. Jose Joseph		1.Gopakumar, K: (2000) Textbook of fish processing Technology
2.	Biochemical composition of fish	5	“	“	
3.	Post mortem changes in fish	2	“	“	
	<b>Module II Fish handling &amp; storage</b>	<b>17</b>			
4.	Preservation of fish	5	Dr. Jose Joseph	“	2. Balachandran, K.K.(2001)
5.	Chilling of fish	2	“	“	Post harvest technology of fish and fish products
6.	Ice & ice storage of fish	3	“	“	
		4	“		

7.	Transportation of fish and development of containers for transportation of fish			“	3. Robertson, G.L (1993) Food packaging
8.	Handling of fish onboard vessels	2		“	4. Farber Jetty M & Todd Ewen C.D (2000) Safe handling of foods
9.	Preservation and processing of fish	1		“	

Term – II – 40 % of the syllabus ( before the second Internal tests)					
	Topic/Module	Hour/ session	Teacher/invited persons etc.	Method of teaching *	Remarks: Books, reference etc
	<b>Module II</b>	<b>3</b>			
10.	Salting/curing/drying of fish-freeze drying of fish	3	Dr. Jose Joseph	Lecture method (conventional)	1.Connell J.J (1980) Advances in fishery science and technology
	<b>Module III- Freezing Technology of fish</b>	<b>33</b>			
11.	Freezing technologies & equipments	5	“	“	2.Borgastrom G (1962) fish as food
12.	Methods of processing, storage and distribution of frozen fish	5	“	“	
13.	Frozen fishery products of commerce	5	“	“	3. Roy E. Martin (1982) chemistry &

14.	Canning of fish	3	“	“	biochemistry of marine food products
15.	Can materials , principles of canning, heat penetration characteristics, spoilage in canned products	10	“	“	
16.	Heat processing of fish in flexible pouches	2	“	“	
17.	Irradiation preservation of fish	3	“	“	



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\*ICT enabled, Lecture method (conventional)

Term – III – 30 % of the syllabus (before the model examination)					
Sl No	Topic/Module	Hour/ session	Teacher/invited persons etc.	Method of teaching *	Remarks: Books, reference etc.
13.	<b>Module III</b>	<b>2</b>	Dr. Jose Joseph	Lecture method (conventional)	
	Packaging of fish & fishery fishery products	2			
14.	<b>Module IV Fishery products</b>	<b>10</b>	"	"	
	Traditional products cured and dried products	5			
15.	Diversified feed to value added products-minced fish, IQF products, Freeze dried products, battered & breaded products	5	"	"	
	<b>Module V Fishery byproducts</b>	<b>15</b>			
16.	Fish meal, fish oil, fish maws, Chitin, Chitosan, Glucosamine hydrochloride , Their production and industrial application, Utilization of Krill's, Squilla, Prawn waste	12	"	"	
17.	Fish hydrolysates and fish silage	3	"	"	

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\*ICT enabled, Lecture method (conventional)

### **Assignments**

1. Chemical composition of fish
2. Post mortem changes in fish
3. Freezing equipments
4. Canning
5. Freezing
6. Irradiation
7. Fish meal
8. Fish hydrolysate
9. Extruded fishery products
10. Traditional fishery products
11. Value added products
12. Transportation of fish

**SACRED HEART COLLEGE THEVARA, KOCHI**

**Course Plan –Post Graduate Programme**

**Programme: M.Sc. Aquaculture and Fish Processing**

**Semester: SEMESTER IV-ACT403: Fish microbiology & Quality assurance**

<b>Term – I (Before I Internal tests) – 30 % of the syllabus</b>					
<b>Sl No</b>	<b>Topic/Module</b>	<b>Hour/ session</b>	<b>Teacher/invited persons etc.</b>	<b>Method of teaching</b>	<b>Remarks: Books, reference etc</b>
	<b>Module I Fish microbiology</b>	<b>27</b>	Dr. S.Sanjeev		
1.	Fundamental principles of bacteriology	3	“	ppt	1. Robinson, R.K. (1985). Microbiology of frozen foods
2.	Bacteria, morphology, size of bacteria, reproduction and growth of bacteria	7	“	“	
3.	Bacterial spores- staining of bacteria, differential staining	2	“	“	
4.	Effect of environment on growth of bacteria, classification of bacteria	5	“	“	
5.	Bacteria in fish spoilage- native flora of bacteria of fishes – Bacteria of public health significance, microbiological hazards in fish	10	“	“	
					2. Bonnell A.D (1994). Quality Assurance in seafood processing

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Term – II – 40 % of the syllabus ( before the second Internal tests)					
	Topic/Module	Hour/ session	Teacher/invited persons etc.	Method of teaching *	Remarks: Books, reference etc
	<b>Module I</b>	<b>3</b>		ppt	
6.	Effect of salting, thermal processing, drying and freezing on bacteria Salting/curing/drying of fish- freeze drying of fish	3	Dr. S.Sanjeev	“	
	<b>Module II- Quality Control</b>	<b>30</b>	“	“	
7.	General aspects of seafood quality and quality problems	5	“	“	
8.	Fish spoilage and quality assessment	5	“	“	
9.	Bacteriology of spoilage of fish and shellfishes	5	“	“	
10.	Fecal indicator bacteria in fish and bacteria of public health significance	3	“	“	
11.					

12.	Salmonella in seafoods	2		“	
	Seafood toxins	2		“	
13.	Quality of water and ice for seafood processing	3		“	
14.	Trace metals in fish and shellfish	3			
15.	Good manufacturing practices in seafood processing	2			
16.	<b>Module III. Quality assurance in seafood trade</b> End product quality and process control	3			

\*ICT enabled, Lecture method (conventional)

Sl No	Topic/Module	Hour/ session	Teacher/invited persons etc.	Method of teaching *	Remarks: Books, reference etc.
	Term – III – 30 % of the syllabus (before the model examination)				
	<b>Module III Quality assurance in seafood trade</b>	<b>27</b>	Dr. S.sanjeev	ppt	
17.	Hazard analysis and critical control points in seafood industry	9	“	“	

18.	National and international standards for fish and fishery products	9			
19.	Quality management and ISO 9000 series of standards	9	"	"	

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### Assignments

1. Antibiotic residues in seafood
2. Physical methods for assessing fish quality
3. Bacteriological standards of seafood for export
4. Implementing SSOP's during processing
5. Different types of hazards in seafood
6. Qualities of indicator organisms
7. Principles of gram staining organisms
8. Three important species of Staphylococcus causing food poisoning
9. Growth phases of bacteria
10. TPC
11. Sterilization
12. SOP and SSOP