



# Central Institute of Fisheries Technology

Cochin

## Courses

1. Design and Operation of Responsible Fishing Gear
2. Seafood Quality Assurance
3. HACCP for Seafood Industry
4. Laboratory Techniques for Microbiological Examination of Seafoods
5. Biochemical Evaluation of Fish and Fishery Products
6. Extension Methodologies for Coastal Fisheries
7. Fishery Byproducts—Prawn-shell Powder—Chitin and Chitosan, Glucosamine Hydrochloride and High Density Chitosan
8. Development of Fish and Shrimp-based Value-added Products
9. Design and Operation of Fishing Vessels
10. Energy Efficient and Eco-friendly Fish Drying Systems
11. Food Hygiene and Seafood Industry

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The Central Institute of Fisheries Technology established on 29 April 1957 is the only multi-disciplinary Institute in South East Asia with capability of dealing with the entire range of harvest and post-harvest technology of fish.

The Institute has its headquarters at Cochin, Kerala, and Research Centres at Veraval (Gujarat), Visakhapatnam (Andhra Pradesh), Burla (Orissa), Mumbai (Maharashtra) and Calicut (Kerala). Research work is carried out by the research division, viz Fishing Technology, Fish Processing, Quality Assurance and Management, Microbiology, Fermentation and Biotechnology, Engineering and Extension, Information and Statistics and Biochemistry and Nutrition.

The Institute is well equipped with laboratories and allied facilities in all major subject areas of fishery technology.

# 1. Design and Operation of Responsible Fishing Gear

The training programme is meant for the fishing technologists to acquaint themselves with the recent developments in harvest technology of fish and to give exposure to the concepts delineated in the Code of Conduct for Responsible Fisheries with special reference to fishing operations. Conservation of fishery resources through responsible fishing techniques like bycatch reduction devices and optimization of mesh size in shrimp and fish trawls and square meshes in cod end for facilitating escapement of juveniles are dealt within the course. Eco-friendly fishing gears and methods which can ensure minimum damage to the ecosystem is also dealt with. The course includes both theoretical and practical training classes.

## Faculty

The Institute has well experienced and highly qualified team of scientists and technical officers in the field of design and construction of fishing vessels; operation and maintenance of marine engines; design and fabrication of onboard facilities and deck equipments; design and fabrication of electronic aids for fishing; design and fabrication of fishing gear etc. The Institute offers services in the testing and certification of marine engines and fishing vessels, design and construction supervision of fishing vessels and small craft; design and fabrication fishing gear; design and development of fuel efficient propeller systems; development of onboard systems and equipments.

<b>Course Director</b>	: Dr B Meenakumari
<b>Duration</b>	: 10 weeks (7 September-13 November 2009)
<b>Course fee</b>	: US \$ 2,500 per trainee (exclusive of boarding and lodging)
<b>No. of trainees per course</b>	: 4
<b>Accommodation</b>	: To be arranged in the Institute's guest house at reasonable rate
<b>Eligibility</b>	: Graduate in Fisheries/Science or equivalent

## Course Contents

- Basic design, fabrication and rigging of responsible fishing gears
- Testing of different materials used for fishing
- By catch reduction devices
- Design and operation of ecofriendly trawls
- Design and fabrication of improved lobster traps
- Design and fabrication of turtle excluder devices
- Field trials on board departmental fishing vessels/ commercial fishing vessels



## 2. Seafood Quality Assurance

This training programme is meant for the technologists and managers of seafood processing industry. The course includes basic principles of seafood quality assurance through organoleptic, microbial and chemical evaluation as well as basic plant design and process control, evaluation of food safety hazards etc. Besides, the course also covers basic systems of inspection in seafood processing plants, National and International standards (EU & USFDA) and principles of HACCP. The course includes both theoretical and practical classes of techniques and methodology of seafood quality assurance.

### Faculty

Experienced scientists of the institute will form the faculty of the courses.

<b>Course Director</b>	: Dr M K Mukundan
<b>Duration</b>	: 12 days (14-26 September 2009)
<b>Course fee</b>	: US \$ 1,500 per trainee
<b>No. of trainees per course</b>	: 10-15
<b>Accommodation</b>	: To be arranged in the Institute's guest house at reasonable rate
<b>Eligibility</b>	: Graduate in Fisheries/Science or equivalent

### Course Contents

- Organoleptic evaluation of fish/shell fish
- Fundamentals of bacteriology
- Methods of identification and isolation of pathogens and indicator organisms
- Quality problems
- Quality management
- Requirements of importing countries
- Methods of evaluating fish freshness and quality
- Legislation on export inspection in India
- Systems of inspection



## 3. HACCP for Seafood Industry

Hazard Analysis and Critical Control Point (HACCP) and Pre-requisite Programmes (PRPs) have become very much relevant to the food processing industry in general and seafood industry in particular after the implementation of European Union and FDA Regulations. The training programme on HACCP for seafood industry systematically introduces basic principles of ISO 22000 namely HACCP principles, preparation of HACCP manual, conducting hazard analysis, formation of HACCP plan form, development of prerequisites for safe food preparation etc. so as to enable the trainees to prepare manual, establish plant HACCP and conduct verification / audit on their own. The trainees will be familiarized with all types of hazards, viz biological, chemical and physical, commonly encountered in the seafood industry. Case studies of different marine products will be taken up to get a practical experience in hazard analysis and HACCP implementation. The course also describes different types of records to be maintained.

<b>Course Director</b>	: Dr M K Mukundan
<b>Duration</b>	: 6 days (19-24 October 2009)
<b>Course fee</b>	: US \$ 750 per trainee (exclusive of boarding and lodging)
<b>No. of trainees per course</b>	: 10-15
<b>Accommodation</b>	: To be arranged in the Institute's guest house at reasonable rate
<b>Eligibility</b>	: Graduate in Fisheries/Life Science or equivalent

### Course Contents

- Hazard analysis
- Preparation of flow charts
- Identification of hazards
- Identification of CCP's
- Corrective actions, verification, auditing, record keeping and preparation of HACCP manual



## 4. Laboratory Techniques for Microbiological Examination of Seafoods

The fish processing industry has emerged as a well organized food processing industry in most of the nations of the world. Fish being a protein rich virgin product from the sea and other aquatic systems, is in great demand as a commodity for export. From the environments and during handling, fish/shellfish can harbour some pathogens as well as some toxigens. The FAO, USFDA and the EC are insisting that the processed fishery products should meet strict sanitary and phytosanitary regulations laid down by the importing countries/WTO. This needs modern microbiological testing laboratories and well trained technicians. The proposed training course is meant for training science graduates as excellent laboratory technicians in microbiology for testing fish and fishery products for pathogens and related parameters.

### Faculty

Fully qualified and experienced scientists of the microbiology, fermentation and biotechnology (MFB) division constitute the faculty.

- Course Director** : Dr N Thampuran
- Duration** : 4 weeks (6 July -1 August 2009)
- Course fee** : US \$ 1,500 per trainee (exclusive of boarding and lodging)
- No. of trainees per course** : 6
- Accommodation** : To be arranged in the Institute's guest house at reasonable rate
- Eligibility** : Bachelor's degree in Chemistry/ Biochemistry/Fishery Science/ Biotechnology/Microbiology/Food Science/Veterinary Science/Life Science of any recognized university or a 2 year diploma in Food Science after 10+2 schooling

### Course Contents

- Fundamentals in fishery microbiology; Basic techniques in bacteriology, microscopy, media preparation; bacteriological analysis for total bacteria, Coliforms, *E. coli*, Streptococci, Staphylococci, *Salmonella*, Pathogenic Vibrios (*V. cholerae*, *V. parahaemolyticus*, *V. vulnificus*), *Listeria* spp., *Bacillus cereus*, *Clostridium botulinum* and *C. perfringens*; Isolation of yeast and molds; MPN techniques, Toxin assay of Staphylococcus, *Bacillus cereus* and *Clostridium botulinum*; PCR techniques; Assay for antibiotics in tissues (Microbiological methods and ELISA)



## 5. Biochemical Evaluation of Fish and Fishery Products

Reliable data on biochemical composition is very important for several purposes. Chemical parameters are basic requirements for assessing the nutritional value and the overall quality of fish and fishery products. Equally important is monitoring the levels of toxicants and pollutants, viz heavy metals, hydrocarbons, pesticide residues, antibiotic residues etc. in these products and the ecosystem. The advanced analysis requires well-equipped laboratories and well-trained personnel. The Biochemistry and Nutrition Division has the advantage of having both equipment and manpower to impart necessary training in these areas.

### Faculty

Experienced scientists of the institute will constitute the faculty.

<b>Course Director</b>	: Dr T V Sankar
<b>Duration</b>	: 6 weeks (20 July-29 August 2009)
<b>Course fee</b>	: US \$ 2,500 per trainee (exclusive of boarding and lodging)
<b>No. of trainees per course</b>	: 4
<b>Accommodation</b>	: To be arranged in the Institute's guest house at reasonable rate
<b>Eligibility</b>	: Bachelor's degree in Biochemistry/Fishery Science/ Food Science/Biotechnology of any recognized university

### Course Contents

- Proximate composition analysis
- Protein
  - fractionation
  - quantification
  - amino acid analysis (HPLC)
  - electrophoretic separation
- Lipids
  - Chemical analysis*
    - iodine value
    - saponification value
    - peroxide value
  - Fractionation*
    - phospholipids
    - neutral lipids
    - non-saponifiable matter
    - cholesterol
- Fatty acid analysis (GC)
- Heavy metal (AAS)
- Organochlorine pesticides (GC)
- Polyaromatic hydrocarbons (HPLC)
- Antibiotic residues (HPLC) - MS MS
- Aflatoxin (HPLC)

## 6. Extension Methodologies for Coastal Fisheries

The course is organized for the extension/development/research officials and it aims to highlight the various extension methodologies which could be used in development organizations. Needs assessment is to be done and need-based programmes and schemes have to be developed for technology transfer. By identifying the critical factors in the adoption of innovations, the rate of adoption of innovations could be increased. The course also deals with the human resource development aspects in fisheries. Different evaluation techniques and impact analysis methods will be discussed. The course will also focus on the innovative approaches in coastal zone management and appropriate technologies in fishing, fish processing and seafood quality assurance.

<b>Course Director</b>	: Dr S Balasubramaniam
<b>Duration</b>	: 3 weeks (10-28 November 2009)
<b>Course fee</b>	: US \$ 2000 per trainee (exclusive of boarding and lodging)
<b>No. of trainees per course</b>	: 5-10
<b>Accommodation</b>	: To be arranged in the Institute's guest house at reasonable rate
<b>Eligibility</b>	: Graduate in fisheries/science or equivalent

### Course Contents

- Extension methodologies
- Programme building in fisheries
- Technology transfer system and strategies
- Adoption and diffusion of innovations
- Communication for fisheries development
- Human resource development in fisheries
- Evaluation techniques and impact analysis
- Innovative approaches in coastal zone management
- Appropriate technology in fishing, fish processing and seafood quality assurance



## 7. Fishery Byproducts – Prawn Shell Powder-Chitin and Chitosan, Glucosamine Hydro-chloride and High Density Chitosan

The shellfish processing plants through out the world face a problem of disposal of the wastes which amounts to 50% of the raw material. This can be solved by converting this waste into useful products, shell powder, chitin and chitosan, glucosamine and high density chitosan. These are having application in feed formulations, dietary supplements and pharmaceuticals. In addition to solving pollution problems, it will generate income and employment opportunities.

### Faculty

The Institute has well experienced scientists in this faculty.

<b>Course Director</b>	: Dr P T Mathew
<b>Duration</b>	: 4 weeks (4-30 May 2009)
<b>Course fee</b>	: US \$ 2,550 per trainee (exclusive of boarding and lodging)
<b>No. of trainees per course</b>	: 10
<b>Accommodation</b>	: This will be provided at a very reasonable cost at the Institute's guest house
<b>Eligibility</b>	: Bachelor's degree in Science or equivalent from any university or institution with experienced in the relevant field

### Course Contents

- Handling of shellfish wastes
- Dehydration and pulverising
- Production of chitin and chitosan



## 8. Development of Fish and Shrimp-based Value-added Products

The present market trends reflect a rapidly growing demand for ready-to-cook/ready-to-serve convenience and value-added fish and fishery products. Value-added products fetch more unit price compared to conventional products. Due to these reasons, the fish processing industries all over the world are trying to change their production strategy from conventional products to value-added products. However, the product should satisfy the quality criteria and the product specifications of the buyer.

### Faculty

The Institute has well experienced and specially trained faculty to handle various aspects of the training course.

- Course Director** : Dr T K Srinivasa Gopal
- Duration** : 2 weeks (16-28 November 2009)
- Course fee** : US \$ 1,000 per trainee (exclusive of boarding and lodging)
- No. of trainees per course** : 10
- Accommodation** : This will be provided at very reasonable cost at the Institute's guest house
- Eligibility** : Bachelor's degree Science or equivalent with experience in fish processing

### Course Contents

- Handling and processing
- Preparation of raw materials
- Development of products such as fish finger, fish steaks, fish cutlets, fish balls, breaded shrimp, *nobashi*, *sushi*, skewered shrimp, *barbacu* etc.



## 9. Design and Operation of Fishing Vessels

### Faculty

The Institute has well experienced and highly qualified team of scientists and technical officers in the fields of design and construction of fishing vessels, operation and maintenance of marine engines, design and fabrication of onboard facilities and deck equipments, design and fabrication of electronic aids for fishing, design and fabrication of fishing gear etc. The Institute offers services in the testing and certification of marine engines and fishing vessels, design and construction supervision of fishing vessels and small craft, design and fabrication of fishing gear, design and development of fuel efficient propeller systems, development of onboard systems and equipments, evaluation and certification of electronic equipments for fishing, etc. in addition to training for university students in the design of fishing vessels.

- Course Director** : Mr M Nasser
- Duration** : 5 months (2 February-30 April 2009)
- Course fee** : US \$ 5,000 per trainee (exclusive of boarding and lodging)
- No. of trainees per course** : 10
- Accommodation** : This will be provided at a very reasonable cost at the Institute's guest house
- Eligibility** : Bachelor's degree in Science or equivalent with experience in the relevant field

### Course Contents

- Basic design of fishing vessels
- Onboard facilities and equipments
- Fitting out of fishing vessels
- Navigational aids
- Electronic aids for fishing
- Selection of fishing vessels and their equipments
- Constructional aspects of fishing vessels
- Setting up of boat yard
- Inspection of fishing vessels
- Computer aided applications in design and construction of fishing vessels
- Maintenance of fishing vessels
- Fleet management
- Project evaluation



## 10. Energy Efficient and Eco-friendly Fish Drying Systems

### Faculty

Highly qualified scientists of this institute will constitute the faculty.

- Course Director** : Dr P N Joshi
- Duration** : 1 week (22-27 June 2009)
- Course fee** : US \$ 500 per trainee (exclusive of boarding and lodging)
- No. of trainees per course** : 5
- Accommodation** : This will be provided at a very reasonable cost at the Institute's guest house
- Eligibility** : B.Sc. in Chemistry/zoology/ biology/fisheries/aquaculture or equivalent

### Course Contents

- Materials selection and dryer fabrication methods
- Evaluation of drying systems; cost and capacity analysis
- Instrumentation—measurement of drying parameters; temperature monitoring
- PV operation; Battery buffer
- Back up systems using eco-friendly gaseous fuels, PV cells and electricity
- Small, medium and large scale fish dryers
- Operation and maintenance of fish dryers



## 11. Food Hygiene and Seafood Industry

### Training Programme

Keeping a clean workplace, staff and equipment is an important part of food hygiene. If one practices good hygiene, the safety of the food can be guaranteed. In order to achieve safety, food handlers have to follow good hygiene practice. Hygiene should be practiced at landing centres, processing area inside the processing hall etc. Plant hygiene, personal hygiene, raw material hygiene, clean water are all essential elements of food hygiene. Thus, the food we eat should not make us ill. Careful food hygiene, would avoid food poisoning. Application of key hygiene control at each step from primary production to the final consumer are essential for food safety. An HACCP based approach would guarantee safe food.

### Faculty

Well qualified and trained scientists and technical staff of the QAM Division

- Course Director** : Shri K George Joseph  
Acting Head, Quality Assurance and Management Division
- Duration** : 3 working days  
(10-12 November 2009)
- Course fee** : US \$ 200 (exclusive of travel, boarding and lodging)
- No. of trainees per course** : 10
- Eligibility** : Graduates in Sciences / People working in the seafood industry.

### Course Contents

- Principles of food hygiene
- Food and disease
- Hygienic handling of food
- Importance of clean workplace and bacterial contamination
- GMP, GHP and HACCP
- Food hygiene and business
- Chemical contamination of foods
- Safe food preparation

