

Centurion University of Technology and Management

School of Fisheries

B.F.Sc Program

Centurion University of Technology & Management offers undergraduate program in **School of Fisheries**. The mission of the school is to establish itself as a centre of excellence in the field of Fisheries and Aquaculture hands-on practice/project based teaching-learning methods, use of designing software and strong industry-institute partnerships. The school focuses on skill oriented courses to promote production oriented learning.

Mission: The central purpose of School of fisheries is to focus on the critical issues in Fisheries and Aquaculture in the region of Parlakhemundi. We achieve our purpose in teaching by designing basic, yet futuristic, degree programs that empower students to contribute globally through satisfying and productive careers. We also achieve our purpose in research and outreach by generating the knowledge and disseminating the results that will enhance the economic vitality and quality of life of the people and stakeholders we serve.

Vision: In five years, the school will be evolving into a focal point for addressing the major challenges related to the people and stakeholders we serve.

- We will be a major player in improving the health and wellness of the people by researching and providing knowledge through basic and innovative programs.
- We will be investigating and providing strategic direction to positively impact the economic vitality and sustainability of the agriculture, food and forestry stakeholders we serve.
- We will enhance and extend the natural beauty and conservation of our area through sound stewardship practices of aquaculture and other environmental resources

PO (Program outcomes) –B.F.Sc

PO1	Aquaculture: Students will develop a better understanding of the history of aquaculture and different aquaculture production system which is suitable for enhanced fish production. Further the students will be able to carry out breeding and seed production technology for commercially important fin fish and shell fish. Additionally educate about fish nutrition and fish biochemistry; fisheries genetic tools and fish biotechnology
PO2	Fisheries Resource Management: Studies the basic biology and anatomy of the fishes including differentiating genera/ species up to stock level using classical and molecular techniques. Understanding the application of various models to estimate fish population in order to find out the interaction of tropical fish population in the ecosystem. Furthermore it inculcate the understanding of marine and inland fisheries resources and its protection to the students
PO3	Aquatic Animal Health Management: Studies includes identification of fish and shell fish disease and their remedies. It also emphasizes the use of better management practices for the preventing farmer losses due to diseases. Involves studying of various pathogens affecting aquaculture industry
PO4	Aquatic Environment Management: Demonstrates the knowledge and understanding of environmental parameters on the global fish population and aquaculture. Additionally

	students develops understanding effects of aquatic pollution on life of the fish. The student learn about the optimal water quality requirement and its amelioration for maximizing the fish production through aquaculture.
PO5	Fish Processing Technology: The objective of the course is to educate the students about harvesting and post harvesting techniques used in fisheries and aquaculture. It particularly deals with educating the students about usage of different equipment and various standards and regulation implemented in fish processing industry. It also deals with the quality assurance of fish and shell fish products. The students are also have hand on training for preparation of value added fish/Shell fish products
PO6	Fisheries Engineering: Educates the students about the engineering aspect of pond preparation. Have a better understanding of different fishing craft and gears used for fishing in inland and marine areas. Further students are exposed to navigation and seamanship for better understanding of sailing in marine areas.
PO7	Fisheries Extension uses democratic methods in educating the farmers. Extension Helps in adoption of innovations. It helps in studying and solving the rural problems. Extension increases farm yields and improve the standard of living of farmers. Extension makes good communities better and progressive. Extension contributes to national development programmes
PO8	Fisheries Economics and Statistics: Have a solid understanding of how markets operate and the effects of extensive government policies on those markets; 2. Obtain basic skills in mathematical and analytical reasoning and statistical techniques; 3. Be able to read and comprehend general articles in business and economics journals; 4. Understand firm and farm level decision rules for the efficient operation of enterprises and the institutional structure and use of marketing systems; 5. Be able to analyze changes in market and general economic conditions in a broad array of settings and be able to determine the impact on various groups affected by those changes; 6. Have knowledge in supporting areas such as accounting in order to better develop technical knowledge specific to aquaculture, fisheries and processing business; 7. Be able to present ideas effectively in oral and written forms to those in the fisheries field

PSO-Program Specific Outcomes- B.F.Sc

PSO1: To know the basis of technologies of aquaculture, to understand the principles of its importance, purpose and application.

PSO2: To develop modern equipment in laboratories, special computer programs for design of fisheries and aquaculture farms by implementation of innovative ideas for management of farms.

PSO3: To develop understanding of fisheries and aquaculture technological processes, identify problems and solve them, relate agriculture activity and aquaculture productivity and safety, analyze and evaluate effects of the fisheries and aquaculture on the environment, to provide the preventive safety measures.

PSO4: To know the conditions of development of aquatic organisms and its habitat conditions, formation and change patterns of yielding in relate with the environmental changes of anthropogenic influence

PSO5: To know the fisheries and aquaculture schemes used in breeding, rearing and feeding technologies in farms, their purpose and principles of application, be aware of the fisheries and aquaculture design and construction principles, taking into account the legislation and directives.

PSO6: Describe the fisheries and aquaculture business management features, methods, and strategies for aquaculture business development, operational funding, fisheries and aquaculture production innovation and marketing issues and strategies.

PSO7: To develop understanding of fisheries and aquaculture technological processes, identify problems and solve them, relate agriculture activity and aquaculture productivity and safety, analyze and evaluate effects of the fisheries and aquaculture on the environment, to provide the preventive safety measures.

PSO8: Apply traditional research methods, scientific literature, information technologies and statistical methods of calculation to perform and summarize the research and creative use results of analysis by preparation of the final thesis and oral presentations

PSO9: Apply methods and techniques used in fisheries and aquaculture design and construction, their management methods and quality assurance principles.

PSO10: Solve the technological challenges related to management of fisheries and aquaculture farms; organize activities to ensure their entrepreneurship and competitiveness

PSO11: To critically and logically contemplate, to have a reasoned opinion and be able to defend it, to gather and present scientific information to different audience

Course Outcome (CO)

SEMESTER – I

FSAQ 1101

PRINCIPLES OF AQUACULTURE

2(1+1)

Course Objective:

Principles of Aquaculture gives outline about the basics and history of aquaculture. A wide range of aspects such as Systems of aquaculture, aquaculture in different types of water bodies, Principles of organic aquaculture, Pond management, study of Monoculture, polyculture and integrated culture systems, Water and soil quality in relation to fish production and estimation of productivity, factors affecting productivity of ponds, Nutrition, health management and economics were portray detailed.

Course Outcome:

Students will develop a better understanding of the history of aquaculture and different production systems employed for better production

Course Outcome:

By completing this course the student will learn to perform the following: 1) How to calculate and apply measures of location and measures of dispersion -- grouped and ungrouped data cases. 2) How to apply discrete and continuous probability distributions to various business problems. 3) Perform Test of Hypothesis as well as calculate confidence interval for a population parameter for single sample and two sample cases. Understand the concept of p-values. 4) Learn non-parametric test such as the Chi-Square test for Independence as well as Goodness of Fit. 5) Compute and interpret the results of Bivariate and Multivariate Regression and Correlation Analysis, for forecasting and also perform ANOVA and F-test. Further, understand both the meaning and applicability of a dummy variable and the assumptions which underline a regression model. Be able to perform a multiple regression using computer software.

FSAQ 1112

FUNDAMENTALS OF BIOCHEMISTRY

3(2+1)

Course Objective:

To acquaint students with the biochemical functions of different biomolecules.

Course Outcome:

Demonstrate an understanding of fundamental biochemistry principles, including topics specific to chemistry and biochemistry. Design, carry out, and record the results of chemical and biochemical experiments using classical techniques, modern instruments, and/or computers, then analyze those results to draw reasonable, accurate conclusions.

FSHM 1107

FUNDAMENTALS OF MICROBIOLOGY

3(2+1)

Course Objective:

To impart knowledge on aquatic microorganisms with reference to their role in the aquatic environment and bioprospecting. To impart knowledge of the basic principles of bacteriology, virology, pathogenic microorganisms, pathogenesis, laboratory diagnosis. To acquire requisite skill in the use and care of basic microbiological equipment; performance of basic laboratory procedures in microbiology.

Course Outcome:

Demonstrate an understanding of the structure and function of bacterial cells and viruses. Students will be able to explain the processes used by microorganisms for their replication, survival, and interaction with their environment, hosts, and host populations; Students will know the theoretical basis of the tools, technologies and methods common to microbiology.

FSEM 1102

SOIL AND WATER CHEMISTRY

3(2+1)

Course Objective:

To learn effective soil and water quality management practices which is important for any aquaculture endeavours

Course Out come

Students will have an insight into the important water and soil quality management and their amalgamation for successful aquaculture operation

FSPT 1101

FISH IN NUTRITION

1(1+0)

Course Objective

To create basic understanding on the nutritional requirements of fish/shellfish. To study about different composition of fish with emphasis on nutritional value, Potential of fish for nutritional security. To know about effect of different kinds of processing methods of on nutritional value and quality of fish.

Course Outcomes

Students will get their knowledge on Nutritional composition of fish and its health benefits to human being. Fish as an alternate source of protein that form part of a balance diet.

FSCC 1101

SWIMMING

1(0+1)

Course Objective :

The main Course Objective of the course is to provide the students with basic knowledge of swimming and to enhance water safety, awareness and confidence in water. To teach the phobia students to overcome fear in water. Emphasis is learn through play and excel in the swimming skill.

Course Outcome:

Student will enhance their swimming skills

SEMESTER – II

FSAQ 1202

FRESH WATER AQUACULTURE

3(2+1)

Course Objective:

To gain in depth knowledge and field exposure on sustainable aquaculture practices.

Course Outcome

Students will be exposed to various production systems in aquaculture along with species diversification

FSRM 1203**ANATOMY AND BIOLOGY OF FINFISH****3(2+1)**

Course Objective:

Biology is the study of life forms and in this undergraduate course the students will be studying life history events of fishes. Here the life history event of fishes will be dealt with regard to their food and feeding habits, age and growth, maturation and reproductive strategies followed by embryonic and larval development.

Course Outcome:

Students will have a hand on experience about different organs present in fish body along with the importance of these organ for them living processes in fishes

FSEM 1203**LIMNOLOGY****3(2+1)**

Course Objective:

To educate the students on the ecology of limnetic wetlands and to impart skill and knowledge on the sustainable management of the limnetic ecosystems.

Course Outcome:

Students will get broad vision about the characteristics of limnetic water bodies and methods for efficient management of this vast resources

FSEM 1205**MARINE BIOLOGY****3(2+1)**

Course Objective:

To study the biodiversity of flora and fauna and its assessment using the various biodiversity indices for conservation of aquatic resources. To understand the ecological impacts on various resources.

Course Outcomes:

Student will study the biodiversity of the coastal areas and device different managerial methods to manage it.

FSRM 1206**INLAND FISHERIES****3(2+1)**

Course Objective:

To understand the present exploitation and future potential of inland Fisheries. To learn the methodologies for assessments of Inland Fisheries Resources.

Course Outcome:

Students get to know about different types of inland resources and methods to manage these utilized water bodies.

FSPT 1202**FOOD CHEMISTRY****3(2+1)**

Course Objective

To study about the different composition and nutritional value of food products, benefit of fish for human consumption. To know about different food additives with their chemistry of taste, flavour, odour in food

Course Outcomes

Students will get a better understanding of Nutritional compositions of fish as compare other food ingredients for diet. Different food additives, sources and limits for incorporation into food.

FSEE 1206 INFORMATION AND COMMUNICATION TECHNOLOGY**2(1+1)**

Course Objective:

It prepares the students to participate in a rapidly changing world in which work and other activities are increasingly transformed by access to varied and developing technology.

Course Outcome

Students are well-versed in the use of modern tools like computers and different software

FSAQ 1207**AQUACULTURE IN RESERVOIRS****2(1+1)**

Course Objectives:

To know the different types of reservoir present in India. To know the suitable cultivable fish species in reservoir. To know the management of different size of reservoir.

Course Outcomes:

At the completion of the course the students will have the knowledge about different culture practices in reservoir (Pen, Cages, etc.) about the productivity of different size of reservoir (small, medium large).

FSCC 1202 PHYSICAL EDUCATION, FIRST AID & YOGA PRACTICES**1(0+1)**

Course Objective:

The main aim of this course is to integrate the body, mind, and thoughts so as to work for good ends. Modern life style leads to diseases, which are mostly due to poor food habits, heavy daily routines and to air and water pollution in turn easily affect the human body.

Course Outcome

These practices make one free from diseases, ignorance, egoism, miseries the affiliations of old age, and fear of death etc.

FSAQ 2103 ORNAMENTAL FISH PRODUCTION AND MANAGEMENT 2(1+1)

Course Objective

To impart knowledge on ornamental fish production, bait fish culture and aquatic ornamental plant propagation.

Course Outcome

Students learn about fabrication of aquarium and mass culture of different live food organisms and aquatic plants. Further we will be able to produce ornamental fishes in mass scale.

FSPT2103 FREEZING TECHNOLOGY 2(1+1)

Course Objective:

To know about the different types of low temperature preservation, handling, storage of different type of fish and fishery products to minimize the spoilage along with post harvest loss. To know about the thawing, quality changes on freezing and its control measures, protective treatments, and different types of packaging materials and methods to be used for packing of frozen fish and fishery products.

Course Outcomes

Students will have better understanding on preventive measures to reduce or slow down rate of spoilage in post harvest.. Maximum keeping quality and types of freezing method to adopt with respect to each fish species and shellfish.

FSAQ2111 GENETICS AND BREEDING 2(1+1)

Course Objective:

To impart knowledge on genetic basis of inheritance and breeding plans for commercially important fishes

Course Outcome

Student can effectively select a good quality brood stock for maintaining a low inbreeding depression. They will also get an insight into modern genetical tools like transgenetics, RNAi, Cryopreservation of gametes etc

FSHM2106 FISH IMMUNOLOGY 2(1+1)

Course Objective

To learn the basic principles of Immunology, types of immunity and antigen-antibody interactions. To understand the defense mechanism in finfish and shellfish and learn the Serological methods in disease diagnosis

Course Outcome

Student will have better understanding on Cell types and organs present in the immune response. Apply basic techniques for identifying antigen antibody interactions. The students will be able to describe immunological response and how it is triggered and regulated.

FSEE2102

FISHERIES ECONOMICS

3(2+1)

Course Objective

To familiarise the students with the basic concepts and analytical tools of economics as applied to management decisions. To provide an interface between economics and management decisions.

Course Outcome

Can help the students to effectively manage a fisheries business firm.

FSRM 2109

AQUATIC MAMMALS, REPTILES AND AMPHIBIANS

1(1+0)

Course Objective:

To acquaint the students with the theoretical and practical aspects of the aquatic environment and biodiversity.

Course Outcome

Student will have vivid knowledge on the aquatic biodiversity and their conservation

SEMESTER – IV

FSAQ2204

COASTAL AQUACULTURE AND MARICULTURE

3(2+1)

Course Objective:

To gain knowledge in establishing and managing different fish/shellfish farming systems in coastal waters.

Course Outcome:

Students get an insight into the culture of different commercially important aquaculture species in coastal/marine waters

FSHM 2204 THERAPEUTICS IN AQUACULTURE

2(1+1)

Course Objectives

Identify the fundamental principles of Therapeutics in aquaculture. Compare and contrast the specific pharmacology of the major classes of drugs, important distinctions among members of each class, the risks and benefits, in relation to the organ systems they affect, and the diseases for which they are used therapeutically.

Course Outcomes

They would have studied in detailed about mechanism of drug action at organ system/sub cellular/ macromolecular levels. They would have understood the application of basic pharmacological knowledge in the prevention and treatment of various fish diseases.

FSAQ2208 FISH NUTRITION AND FEED TECHNOLOGY

3(2+1)

Course Objectives

To learn basic concepts of feed formulation and different feed processing techniques.

Course Outcome

Student can prepare feed based on the nutritional requirements of fish/shell fish.

They can prepare feed using different feed formulations

FSPT 2204 FISH CANNING TECHNOLOGY

2(1+1)

Course Objectives

To study about the thermal processing/canning and storage of fish and fishery products to prevent microbial spoilage. To know about advantages of canning in relation to other preservation methods, quality standards, plant layout, hygiene, sanitation and waste disposal of fish processing plant..To know about different canning process, equipments, packaging methods and spoilage of canned foods-types, causes and preventive measures.

Course Outcomes

Students will have better understanding on Steps/ procedure for canning of fish and shellfish in different style. Pre-requisite procedure, importance of quality of raw materials. Importance of D-value, F –value, Z-value etc

FSPT2205 FISH PACKAGING TECHNOLOGY 2(1+1)

Course Objectives

To study about different types of packaging, importance of packaging in fish processing, functions, Course Objectives and requirements. To know about different types of packaging materials, Properties of packaging materials and their use in protective packaging with special reference to food, and principles of their manufacture and their identification. To know about different packaging equipment machinery, package design, evaluation, testing, handling and transportation procedure of package. Safety and legislation aspects of packing, Labelling and bar coding.

Course Outcomes

Different types of packaging materials for different fish and fishery products with respect to size, shape, mode of processing and transportation. Importance of labelling. Hazardous and non-hazardous packaging materials for the consumer.

FSHM2201 FISH AND SHELLFISH PATHOLOGY 3(2+1)

Course Objectives

To provide holistic knowledge on fish and shellfish pathogens and their control measures

Course Outcomes

Students know about different types of pathogen and their treatments

FSFE2203 FISHING CRAFT TECHNOLOGY 2(1+1)

Course Objectives

To understand the operation of various types of traditional and mechanised fishing craft with better design and modification than the traditional once.

Course Outcomes

Student know about different types of fishing craft operated along Indian subcontinent

FSEE2207 FISHERIES EXTENSION EDUCATION 2(1+1)

Course Objectives

To gain insights into different concepts, principles, praxis, recent changes and emerging challenges in fisheries extension. To acquire skills required to practice various fisheries extension approaches.

Course Outcomes

Students will transfer the modern and scientific findings of lab to the farmers land thereby increasing the farmer's profitability

FSAQ2206

SHELLFISH HATCHERY MANAGEMENT

2(1+1)

Course Objectives

To provide overall knowledge of seed production and hatchery management of commercially important cultivable crustaceans and molluscs.

Course Outcomes

Student can breed commercially important shellfish and can setup his/her own hatcheryTheory
Natural seed resources, site selection and collection methods. Life cycle of important shellfish (Penaeus monodon, P. indicus, Macrobrachium rosenbergii, P. Vannamei, Scylla serrata, lobster, edible, oyster, pearl oyster, fresh water mussel, holothurians, horse-shoe crab, Sepia, Loligo, cray fish etc.). Sexual maturity and breeding seasons of different species. Maturation stages of Macrobrachium rosenbergii and Penaeus monodon. and P. Vannamei. Induced maturation in Penaeus monodon and P. Vannamei P. Indicus by eye stalk ablation. Reproductive physiology. Reproductive hormones in crustaceans. Brood stock management of Penaeus monodon and Macrobrachium rosenbergii. Breeding and hatchery management of Penaeus monodon and Macrobrachium rosenbergii. Breeding and hatchery management of crabs lobster, mussel, edible and pearl oyster. Food and feeding of larval stages of important shellfishes. Health management in hatcheries.

FSEE2208 COMMUNICATION SKILLS AND PERSONALITY DEVELOPMENT1 (0+1)

Course Objectives

To help the students in building interpersonal skills. 2) To develop skill to communicate clearly. 3) To enhance team building and time management skills. 4) To learn active listening and responding skills.

Course Outcomes

On completion of the course, learner will be able to: 1) Make use of techniques for self-awareness and self-development. 2) Apply the conceptual understanding of communication into everyday practice. 3) Understand the importance of teamwork and group discussions skills. 4) Develop time management and stress management.

SEMESTER – V

FSAQ 3105

FINFISH HATCHERY MANAGEMENT

3 (2+1)

Course Objectives

To learn seed production and hatchery management of commercially important cultivable fishes.

Course Outcomes

Student can breed commercially important finfish and can setup his/her own hatchery.

FSRM 3104 ANATOMY AND BIOLOGY OF SHELLFISH

2 (1+1)

Course Objectives

Students will be studying life history events of shell fishes. Here the life history event of shell fishes will be dealt with regard to their food and feeding habits, age and growth, maturation and reproductive strategies followed by embryonic and larval development.

Course Outcomes

Students will have a hand on experience about different organs present in shell fish body along with the importance of these organ for their living processes

FSHM 3103

PHARMACOLOGY

3 (2+1)

Course Objectives

Identify the fundamental principles of pharmacokinetics and pharmacodynamics. Compare and contrast the specific pharmacology of the major classes of drugs, important distinctions among members of each class, the risks and benefits, in relation to the organ systems they affect, and the diseases for which they are used therapeutically.

Course Outcomes

Students would have understood the pharmacological actions of different categories of drugs.They would have studied in detailed about mechanism of drug action at organ system/sub cellular/macromolecular levels.They would have understood the application of basic pharmacological knowledge in the prevention and treatment of various fish diseases.

FSHM 3105

FISH TOXICOLOGY

2 (1+1)

Course Objectives

To learn the basic principles of general toxicology, branches of toxicology, classification of poison and diagnosis of poisoning. To learn toxicokinetics, toxicodynamics, systemic toxicology and different types of toxins: phytotoxins, mycotoxins, bacterial toxins.

Course Outcomes

Demonstrate an understanding of the processes involved in absorption, distribution, metabolism and excretion of toxicants, including an understanding of the toxicokinetic behavior of toxicants in fish. Identify relationships between chemical exposure and effects on physiological systems and design strategies for study of dose-response relationships. Demonstrate an understanding of target organ toxicity involving the following organ systems: liver, kidney, blood, skin, reproductive systems.

FSRM 3107 MARINE FISHERIES

3 (2+1)

Course Objectives

To know the present level of exploitation of marine resources and to impart knowledge on conservation measures. To learn the recent methodologies of sustainable exploitation of renewable resources.

Course Outcomes

Students will know the available marine resources of India and means to protect it

FSEE 3104

FISHERIES CO-OPERATIVES AND MARKETING

2(1+1)

Course Objectives

To familiarize with the basic concepts and principles of marketing as applied to fisheries. To provide an interface between marketing and management decision.

Course Outcomes

Students knows the basics of cooperative marketing and may help in formation of fisheries societies or cooperatives

FSFE 3105

FISHING GEAR TECHNOLOGY

2 (1+1)

Course Objectives

To learn advanced fishing gear technology, design modification of existing fishing gears and selectivity studies of various fishing gears.

Course Outcomes

Student gets greater understanding of different fishing gears used for catching of fishes both in inland and marine waters

FSRM 3108 FISH POPULATION DYNAMICS AND STOCK ASSESSMENT

3 (2+1)

Course Objectives

To understand the application of various models to estimate fish population. To get an idea of the interaction of tropical fish population in the ecosystem.

Course Outcome

Students can easily asses the fish/ shell fish population in a given water bodies

FSEM 3108**COASTAL ZONE MANAGEMENT****2 (1+1)**

Course Objectives

To impart knowledge on the coastal resources, integrated coastal zone management strategies and disaster management.

Course Outcomes

Students know about the importance of coastal areas and can plan an effective strategies to conserve it in case of any disaster

FSHM 2202 MICROBIAL AND PARASITIC DISEASES OF FISH AND SHELLFISH 3 (2+1)

Course Objectives

To comprehend the taxonomy, morphology, pathology and host-parasite relation of common parasites and microbes of aquatic organisms and to understand the significance of parasites and microbial pathogens in fish health.

Course Outcomes

Student will know different types of microbial and parasitic diseases in fish/shell fishes and their remedies

FSPT 3209 QUALITY ASSURANCE OF FISH AND FISHERY PRODUCTS 3 (2+1)

Course Objectives

To know about quality dimensions of seafood, Pre-harvest factors affecting quality & Post harvest factors affecting quality, Assessment of quality changes during processing of fish and fishery products. To know about application of HACCP concept in surveillance and quality assurance programmes for different types of fish and fishery products. To know about quality standards, food laws and regulations, schemes, waste management in seafood processing, complaint handling procedure on fish and fishery products and general requirements for export of fish and fishery products to the EU.

Course Outcomes

Knowledge on National and International standards associated with fishery products. Biological, physical, chemical, sensory assessment of fish and fishery products. Optimum acceptable limit of quality parameters both national and internationally.

SEMESTER – VI

FSRM 3210 INTRODUCTION TO BIOTECHNOLOGY & BIOINFORMATICS

2(1+1)

Course Objective

To learn various biotechnological applications for enhancing production through sustainable eco-friendly culture.

Course Outcomes

Student gets a vivid idea about biotechnological tools used in aquaculture

FSFE 3202 REFRIGERATION AND EQUIPMENT ENGINEERING 3 (2+1)

Course Objective

To expose the students to design, maintenance of fish processing plant, machinery and the instruments used in fish processing plants.

Course Outcomes

Students gets exposed to processing methods used in processing plants

FSEE 3203 FISHERIES POLICY AND LAW 1(1+0)

Course Objective

To understand the planning and policy tools and techniques.

Course Outcome

Student will be exposed to various national and international laws for fisheries and aquaculture regulation

FSEM 3207 AQUATIC POLLUTION 2 (1+1)

Course Objective

To impart fundamental and advanced knowledge on different aspects of Aquatic pollution and waste water management.

Course Outcome

Students will have better understanding on the sources of aquatic pollution and means to dealt with it

FSFE 3206

FISHING TECHNOLOGY

2 (1+1)

Course Objective

To learn engineering aspects of marine engines for effective utilization during fishing and propulsion system of fishing vessels.

Course Outcome

Students will have better understanding on the application of marine engines for fishing operation

FSPT 3206 FISH PRODUCTS AND VALUE ADDITION

3 (2+1)

Course Objectives:

To study about the different curing and processing methods of value addition and better utilization of low-valued fish. To know about the different methods of packaging and preservation of cured products, hurdle technology, extrusion technology for processed products. To know about the methodology of traditional Indian and Southeast Asian fermented (fish sauce, fish paste etc.) fishery products.

Course Outcomes

Students will know the technology of Utilization of low valued fish for production of different value added fishery product. Indigenous and traditionally produce fish products from local and other countries and its method of processing. Packaging materials for different value added fish product to maintain maximum hygiene and shelf-life.

FSPT 3208 MICROBIOLOGY OF FISH AND FISHERY PRODUCTS

3 (2+1)

Course Objectives

To study about history, role and significance of microorganisms in nature in foods. To know about different sources and types of microorganisms in fish and fishery products, Enumeration techniques, factors (intrinsic and extrinsic) affecting the growth and survival of microorganisms in food. To know about microbial principles of fish preservation and processing by application of low temperature, high temperature, drying, irradiation. Food borne pathogens involved in infection and intoxication of food. Different biological hazards associated with fish and fishery products.

Course Outcomes

Student will understand different physical, biological and chemical hazards associated with fish and fishery products. Their preventive measures and elimination. Different enumeration techniques of different hazards. Hygiene and sanitation required during different handling and processing methods. Optimum limits of the microbial load in the fish and fishery products.

SEMESTER – VII

FSEL 4101 EXPERIENTIAL LEARNING MODULE (ELP) ON FISH SEED PRODUCTION 20(0+20)

Course Objective

Broad Course Objective of the Programme is to guarantee learning opportunity to the undergraduate students through integration of basic knowledge and conceptual aspects with hands on training and practice in a real life work environment. It also aims to install greater confidence, competitiveness and competence among the graduates to meet needs of private sector and to undertake self-employment in vocations of their choice. The specific Course Objectives are as given below. - To induct hands-on training for undergraduate students in fisheries as part of the course curriculum. - To cultivate capabilities suiting emerging job markets and build entrepreneurship spirit and business management competence among students in that they are able to create employment for themselves and others

Course Outcome

To enable the student as future entrepreneur and employer

SEMESTER – VIII

FSRW 4201 IN-PLANT ATTACHMENT ON FISH SEED PRODUCTION 10(0+10)

Course Objective

Broad Course Objective of the Programme is to guarantee learning opportunity to the undergraduate students through integration of basic knowledge and conceptual aspects with hands on training and practice in a real life work environment. It also aims to install greater confidence, competitiveness and competence among the graduates to meet needs of private sector and to undertake self-employment in vocations of their choice. The specific Course Objectives are as given below. - To induct hands-on training for undergraduate students in fisheries as part of the course curriculum. - To cultivate capabilities suiting emerging job markets and build entrepreneurship spirit and business management competence among students in that they are able to create employment for themselves and others

Course Outcome

To enable the student as future entrepreneur and employer