



**ST. ALBERT'S COLLEGE  
(AUTONOMOUS) ERNAKULAM**

*An initiative of the Archdiocese of Verapoly*  
(Affiliated to Mahatma Gandhi University, Kottayam)

**DEPARTMENT OF  
FISHERIES AND AQUACULTURE**

**PROGRAMME:**

**B.Sc. INDUSTRIAL FISHERIES**

**Programme Outcomes**  
**Programme Specific**  
**Outcomes Course Outcomes**

<b>PO NO.</b>	<b>Programme Outcomes</b> Upon completion of the B.Sc. Degree Programme, the graduate will be adept in a number of transferable, analytical and communication skills including
<b>PO - 1</b>	<b>Critical Thinking:</b> Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.
<b>PO - 2</b>	<b>Problem Solving :</b> Solve problems from the Disciplines of concern using the Knowledge, skills and attitude acquired from humanities / science / mathematics / Social Sciences etc.
<b>PO - 3</b>	<b>Environment and Sustainability:</b> Understand the issues of environmental contexts and sustainable development.
<b>PO - 4</b>	<b>Design Mindset:</b> Represent and develop tasks and work-process for the desired. outcome

<b>PSO NO.</b>	<b>PROGRAMME SPECIFIC OUTCOMES</b> On completion of the B.Sc. Industrial Fish & Fisheries program the students would be skilled in the following specific areas
<b>PSO - 1</b>	Understand the basic concepts of capture, culture and management of fisheries in a sustainable method and operate the same in both the public and private sector.
<b>PSO – 2</b>	Understand the procedures of quality assurance of seafood products and apply the methods in processing of seafood products.
<b>PSO – 3</b>	Understand the basic concepts of the physiological processes of fish, its taxonomy, significance of biotechnology and its multidisciplinary nature combining genetics, microbiology, cell and molecular biology.
<b>PSO-4</b>	Identify and formulate technically sound, economically feasible and socially relevant fishery related projects and use of statistical tools and software for estimation of fisheries resources

**SEMESTER 1**

**CO -PO-PSO Mapping - COURSE NAME: BIOLOGY OF FISHES**

COURSE TITLE      BIOLOGY OF FISHES			
COURSE CODE		AQU02 - AQU1CRT0119	
CO No.	Course Outcomes	POs / PSOs Addressed	Cognitive Level
CO - 1	Outline the organismal form, function and diversity	PO1, PSO 3	U
CO - 2	Explain the foundational concepts of physiological processes of fish	PO1, PSO 3	U
CO - 3	Determine the length-weight relationship to indicate the taxonomic differences and events in the life history of fish.	PO 2, PSO 3	AP
CO - 4	Summarize the mechanism of sense organs in crustaceans and molluscs in detecting the different range of stimuli.	PO1, PSO 3	U
CO - 5	Explain the reproductive process in fish and crustaceans	PO1, PSO3	U

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	2	-	-	-	-	-	2	-
CO2	2	-	-	-	-	-	2	-
CO3	-	1	-	-	-	-	1	-
CO4	1	-	-	-	-	-	1	-
CO5	2	-	-	-	-	-	2	-
AVG CO	1.75	1	-	-	-	-	1.6	-

**CO -PO-PSO Mapping - COURSE NAME: FINFISH AND SHELLFISH TAXONOMY**

COURSE TITLE		FINFISH AND SHELLFISH TAXONOMY	
COURSE CODE		AQU02 - AQU1CRT0219	
CO No.	Course Outcomes	POs/PSOs Addressed	Cognitive Level
CO - 1	Identify candidate species of fin fishes and shell fishes which are used for successful aquaculture practices.	PO 1, PSO 3	U
CO - 2	Generalize the techniques behind collection, preservation, identification, naming and documentation of new organisms.	PO 1, PSO 3	U
C.O - 3	Explain the relationship between organisms at different taxonomic levels.	PO 1, PSO 3	AN
CO - 4	Apply different taxonomic and systematic laws for describing a species.	PO 1, PSO 3	AP
CO - 5	Differentiate the taxonomic characteristics of molluscs and crustaceans.	PO 1, PSO 3	U

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	2	-	-	-	-	-	2	-
CO2	2	-	-	-	-	-	2	-
CO3	1	-	-	-	-	-	1	-
CO4	1	-	-	-	-	-	1	-
CO5	1	-	-	-	-	-	2	-
AVG CO	1.4	-	-	-	-	-	1.6	-

**CO -PO-PSO Mapping - COURSE NAME: FRESHWATER AQUACULTURE**

COURSE TITLE FRESHWATER AQUACULTURE			
COURSE CODE		AQU02 - AQU1CRT0319	
CO No.	Course Outcomes	POs /PSOs Addressed	Cognitive Level
CO - 1	Identify the different forms of freshwaters and list the freshwater fish species being cultured and potential species of India.	PO 1 PSO 1	U
CO - 2	Relate the different types of rearing processes and the different steps and procedures involved in the preparation and management of nursery and rearing systems of fish culture.	PO 1 PO 2 PSO 1	U
CO - 3	Demonstrate the pre-stocking pond preparation steps such as drying, ploughing, liming, and manuring and fertilization and proper procedures for grow out.	PO2, PSO 1	U
CO - 4	Explain the biology and feeding habits of cultivable carps and types of carp farming systems.	PO 2 PSO 3	U
CO - 5	Summarize the different systems of aquaculture including recent techniques like aquaponics and re circulatory aquaculture systems.	PO 2 PSO 1	U

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	2	-	-	-	2	-	-	-
CO2	1	2	-	-	2	-	-	-
CO3	-	2	-	-	2	-	-	-
CO4	-	2	-	-	-	-	1	-
CO5	-	1	-	-	2	-	-	-
AVG CO	1.5	1.75	-	-	2	-	1	-

**CO -PO-PSO Mapping - COURSE NAME: TAXONOMY, FISHERY BIOLOGY AND FRESHWATER AQUACULTURE (P)**

COURSE TITLE		TAXONOMY, FISHERY BIOLOGY AND FRESHWATER AQUACULTURE	
COURSE CODE		AQU02 - AQU1CRP0119	
CO No.	Course Outcomes	POs /PSOs Addressed	Cognitive Level
CO - 1	Identify the different taxonomic groups up to the family level based on the morphological features	PO1 / PSO 3	U
CO - 2	Identify and distinguish the larval forms of Penaeids and non-Penaeids	PO1 / PSO 3	U
CO - 3	Estimate the Gonadosomatic Index in assessing the maturity stages of fish	PO2 / PSO 3	AP
CO - 4	Estimate the Gastosomatic Index in assessing the feeding habits of fish	PO2 / PSO3	AP
CO - 5	Demonstrate the installation of Aquaponics system	PO1, PO4/ PSO1	AP

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	2	-	-	-	-	-	1	-
CO2	2	-	-	-	-	-	1	-
CO3	-	1	-	-	-	-	2	-
CO4	-	1	-	-	-	-	2	-
CO5	2	-	-	1	2	-	-	-
AVG CO	2	1	-	1	2	-	1.5	-

**SEMESTER II**

**CO -PO-PSO Mapping - COURSE NAME: AQUATIC ECOLOGY**

COURSE TITLE      AQUATIC ECOLOGY			
COURSE CODE		AQU02 – AQU2CRT0119	
CO No.	Course Outcomes	POs/PSOs Addressed	Cognitive Level
CO - 1	Summarize how aquatic organisms and water quality is affected by the physical, chemical and biological conditions of the water and how it impacts aquatic environments	PO 3, PSO 1	U
CO - 2	Explain the dependence of all organisms on one another and how energy and matter flow within an aquatic ecosystem.	PO 3, PSO 1	U
CO - 3	Comprehend the benefits and ecological functions and values of riparian zones, wetlands and open water systems and be able to identify the associated zone areas.	PO 3, PSO 1	AN
CO - 4	Identify the major forms of life in the sea, describe the characteristics that distinguish these forms, and describe how these forms relate to each other ecologically.	PO 3, PSO 1	U
CO – 5	Infer the issues related to the management and development of fisheries of the major river systems.	PO 3, PSO 1	U

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	-	-	2	-	2	-	-	-
CO2	-	-	1	-	1	-	-	-
CO3	-	-	1	-	1	-	-	-
CO4	-	-	1	-	1	-	-	-
CO5	-	-	2	-	2	-	-	-
AVG CO	-	-	1.4	-	1.4	-	-	-

**CO -PO-PSO Mapping - COURSE NAME: FISHING TECHNOLOGY**

COURSE TITLE FISHING TECHNOLOGY			
COURSE CODE		AQU02 – AQU2CRT0219	
CO No.	Course Outcomes	POs/PSOs Addressed	Cognitive Level
CO - 1	Explain how the fishing craft has been developed from the ancient time, different types of powers used for propulsion of fishing craft, limitations of indigenous craft and advantages of mechanized craft.	PO1 / PSO1	U
CO - 2	Identify the fishing craft with respect to various factors such as depth of operation, size of the vessel and duration of voyage etc.	PO1 / PSO1	U
CO - 3	Classify the traditional fishing crafts of different states of India and mechanization of fishing craft.	PO1 / PSO1	U
CO - 4	Explain the process of seasoning of wood, preservation of wood, effect of fouling and boring organisms on wood and its prevention.	PO1 / PSO1	U
CO - 5	Classify marine engines and types; illustrate different parts of an engine.	PO1 / PSO1	U

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	2	-	-	-	2	-	-	-
CO2	2	-	-	-	2	-	-	-
CO3	1	-	-	-	1	-	-	-
CO4	1	-	-	-	1	-	-	-
CO5	2	-	-	-	2	-	-	-
AVG CO	1.6	-	-	-	1.6	-	-	-



**CO -PO-PSO Mapping - COURSE NAME: BRACKISHWATER AQUACULTURE AND MARICULTURE**

COURSE TITLE BRACKISHWATER AQUACULTURE AND MARICULTURE			
COURSE CODE		AQU02 – AQU2CRT0319	
CO No.	Course Outcomes	PO s / PSOs Addressed	Cognitive Level
CO - 1	Identify the economically viable and environmentally sustainable culture technologies for finfish and shellfish.	PO 1, PO 3 PSO 1	U
CO - 2	Define economically important brackish water biological resources for their commercial utilization.	PO 1, PSO 1	U
CO - 3	Generalize the policy and planning support for socio-economic development, through environmentally sustainable, brackish water aquaculture	PO 1, PSO 1	U
CO - 4	Demonstrate human resource development and transfer of technology Programmes through training and extension and to provide consultancy services	PO 1, PSO 1	U
CO - 5	Explain the environmental implications of brackish water farms and associated social issues.	PO 1, PSO 1	U

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	2	-	2	-	2	-	-	-
CO2	2	-	-	-	2	-	-	-
CO3	1	-	-	-	1	-	-	-
CO4	1	-	-	-	1	-	-	-
CO5	1	-	-	-	1	-	-	-
AVG CO	1.4	-	2	-	1.4	-	-	-

**CO -PO-PSO Mapping - COURSE NAME: AQUACTIC ECOLOGY, FISHING TECHNOLOGY AND BRACKISHWATER AQUACULTURE AND MARICULTURE**

COURSE TITLE			
AQUACTIC ECOLOGY, FISHING TECHNOLOGY AND BRACKISHWATER AQUACULTURE AND MARICULTURE			
COURSE CODE		AQU02 – AQU2CRP0119	
CO No.	Course Outcomes	PO s/PSOs Addressed	Cognitive Level
CO - 1	Identify commercially important brackish water and marine fishes, crustaceans and molluscs, and recognize phytoplankton and zooplanktons.	PO1, PSO1, PSO 3	U
CO - 2	Identify phytoplankton and zooplankton	PO1, PSO1, PSO 3	U
CO - 3	Describe aquatic food chain and food web.	PO 1, PO3 PSO1	U
CO – 4	Identify the different models of fishing crafts, fishing gears, and fishing accessories.	PO 1, PSO 1	U
CO - 5	Classification and identification of synthetic fibre.	PO 2, PSO 1	U

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	2	-	-	-	2	-	-	-
CO2	2	-	-	-	2	-	-	-
CO3	1	-	1	-	1	-	-	-
CO4	1	-	-	-	1	-	-	-
CO5	-	1	-	-	1	-	-	-
AVG CO	1.4	1	1	-	1.4	-	-	-

**SEMESTER III**

**CO -PO-PSO Mapping - COURSE NAME: INLAND AND MARINE FISHERIES**

COURSE TITLE INLAND AND MARINE FISHERIES			
COURSE CODE		AQU02-AQU3CRT0119	
CO No.	Course Outcomes	PO s / PSOs Addressed	Cognitive Level
CO - 1	Identify the major Inland and Marine Resources of India	PO 3/ PSO 3	U
CO - 2	Generalize the problems encountered by the major water bodies.	PO 1/ PSO 1	U
CO - 3	Explain the fishery regulations and conservation of fish resources.	PO 2/ PSO 2	U
CO - 4	Identify the distribution of fish species in the major zones of ocean as well as river water basins.	PO 4/ PSO 4	U
CO - 5	Estimate fish landing using statistical methods	PO1/ PSO4	AP

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	-	-	1	-	-	-	1	-
CO2	2	-	-	-	2	-	-	-
CO3	-	2	-	-	-	2	-	-
CO4	-	-	-	2	-	-	-	1
CO5	1	-	-	-	-	-	-	2
AVG CO	1.5	2	1	2	2	-	1	1.5

**CO -PO-PSO Mapping - COURSE NAME: BIostatISTICS AND COMPUTER APPLICATION**

COURSE TITLE		BIostatISTICS AND COMPUTER APPLICATIONS	
COURSE CODE		AQU02 – AQU3CRT0219	
CO No.	Course Outcomes	POs / PSOs Addressed	Cognitive Level
CO - 1	Express to present the statistical data in order to comprehend the complicated practical filed scenarios.	PO2, PSO4	U
CO - 2	Develop measures that can be used to summarize a data set: mean, median, mode, percentiles, variance, standard deviation, and range.	PO2, PSO4	U
CO - 3	Know how to use sample data to estimate a population mean, a population variance, and a population proportion and know how to compute point and interval estimates of the population parameters.	PO1, PO2 PSO4	U
CO - 4	Utilize computer based data presentation and analytical tools to perform various numerical data process on Microsoft office.	PO2,PSO4	U
CO - 5	Estimation of total marine fish landings.	PO2, PSO4	AP

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	-	1	-	-	-	-	-	1
CO2	-	2	-	-	-	-	-	2
CO3	2	2	-	-	-	-	-	2
CO4	-	1	-	-	-	-	-	1
CO5	-	1	-	-	-	-	-	1
AVG CO	2	1.4	-	-	-	-	-	1.4

**CO -PO-PSO Mapping - COURSE NAME: AQUACULTURE NUTRITION**

COURSE TITLE      AQUACULTURE NUTRITION			
COURSE CODE		AQU02 – AQU3CRT0319	
CO No.	Course Outcomes	POs / PSOs Addressed	Cognitive Level
CO - 1	Explain the feed manufacturing procedure, equipment, feed transport and feed storage.	PO1, PSO1	U
CO - 2	Illustrate feed formulation techniques for the manufacture of nutritionally balanced feed.	PO1, PSO1	AP
CO - 3	Identify the phytoplankton and zooplankton as fish food organisms and their culture techniques.	PO1, PSO1	U
CO – 4	Enumerate the different types of fish feed ingredients and feed additives used in fish feed	PO1, PSO1	AP
CO - 5	Assess the quality standards of fish/shrimp feeds.	PO1, PSO 1	AP

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	2	-	-	-	2	-	-	-
CO2	2	-	-	-	2	-	-	-
CO3	2	-	-	-	3	-	-	-
CO4	2	-	-	-	1	-	-	-
CO5	2	-	-	-	1	-	-	-
AVG CO	2	-	-	-	1.8	-	-	-

**CO -PO-PSO Mapping - COURSE NAME: BIostatISTICS AND COMPUTER APPLICATION (P)**

COURSE TITLE      BIostatISTICS AND COMPUTER APPLICATIONS			
COURSE CODE		AQU02 – AQU3CRP0119	
CO No.	Course Outcomes	POs / PSOs Addressed	Cognitive Level
CO - 1	Apply to present the statistical data in order to comprehend the complicated practical filed scenarios and compute complex statistical analyses to handle a variety of practical problems using modern statistical techniques.	PO2, PSO4	AP
CO - 2	Calculate data set: mean, median, mode, percentiles, variance, standard deviation, range and correlation, construct the graphical representation of data.	PO2, PSO4	AP
CO - 3	Operate various numerical data process on Microsoft office and identify various computer input and output devices.	PO1, PSO4	U
CO - 4	Detect information and collect data on fisheries by online database	PO2, PSO4	AP
CO - 5	Estimation of total marine fish landings	PO 1, PSO 4	AP

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	-	2	-	-	-	-	-	2
CO2	-	2	-	-	-	-	-	2
CO3	2	-	-	-	-	-	-	2
CO4	-	1	-	-	-	-	-	1
CO5	2	-	-	-	-	-	-	3
AVG CO	2	1.66	-	-	-	-	-	2

**CO -PO-PSO Mapping - COURSE NAME: FRESHWATER HATCHERY TRAINING**

COURSE TITLE FRESHWATER HATCHERY TRAINING			
COURSE CODE		AQU03 – AQU3CRP0219	
CO No.	Course Outcomes	POs / PSOs Addressed	Cognitive Level
CO - 1	Take part in training of breeding and rearing of freshwater fish.	PO 2/ PSO 2	AP
CO - 2	Develop sufficient professional knowledge in fish hatchery to start own enterprise.	PO 4/ PSO 1 & PSO 2	AP

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	-	3	-	-	-	3	-	-
CO2	-	-	-	3	1	3	-	-
AVG CO	-	3	-	3	1	3	-	-

**SMESTER IV**

**CO -PO-PSO Mapping - COURSE NAME: GENETICS AND BIOTECHNOLOGY**

COURSE TITLE GENETICS AND BIOTECHNOLOGY			
COURSE CODE		AQU02 – AQU4CRT0119	
CO No.	Course Outcomes	POs / PSOs Addressed	Cognitive Level
CO - 1	Demonstrate understanding on the fundamentals of genetics and fish genetics.	PO 1, PSO 1 PSO 3	U
CO - 2	Explain molecular techniques and various gene manipulation techniques so that they could cater to the needs of the aquaculture sector and equip themselves with the current advanced technologies for their future career development.	PO 1, PSO 1 PSO 3	U
CO - 3	Compare various hybridization techniques and list the methods of sex determination in fish.	PO 1, PSO 3	U
CO - 4	Explain the applications of biotechnology in aquaculture, pharmaceutical and industrial field.	PO 1, PSO 1 PSO 3	U
CO - 5	Develop knowledge for the fast developing modifications in both fisheries and aquaculture.	PO 1, PSO 3	AP

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	2	-	-	-	2	-	2	-
CO2	2	-	-	-	1	-	2	-
CO3	2	-	-	-	-	-	2	-
CO4	1	-	-	-	1	-	1	-
CO5	3	-	-	-	-	-	2	-
AVG CO	2	-	-	-	1	-	1.8	-



**CO -PO-PSO Mapping - COURSE NAME: PATHOLOGY IN AQUACULTURE**

COURSE TITLE GENETICS AND BIOTECHNOLOGY			
COURSE CODE		AQU02 – AQU4CRT0119	
CO No.	Course Outcomes	POs / PSOs Addressed	Cognitive Level
CO - 1	Outline the major diseases associated with farming practices.	PO 1/ PSO 1	U
CO - 2	Develop knowledge on disease management tools.	PO 2/ PSO 3	U
CO - 3	Identify the pathogenic virus, bacterial, protozoans and parasites in aquaculture.	PO 2/ PSO 3	U
CO - 4	Explain the ecological impact of disease in aquatic environment.	PO 3/ PSO 3	U
CO - 5	Compare traditional and new molecular approaches to disease diagnosis.	PO 1/PSO 3	U

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	2	-	-	-	2	-	-	-
CO2	-	2	-	-	-	-	2	-
CO3	-	2	-	-	-	-	2	-
CO4	-	-	1	-	-	-	1	-
CO5	1	-	-	-	-	-	2	-
AVG CO	1.5	2	1	-	2	-	1.75	-

**CO -PO-PSO Mapping - COURSE NAME: AQUARICULTURE**

COURSE TITLE    AQUARICULTURE			
COURSE CODE		AQU02 – AQU4CRT0319	
CO No.	Course Outcomes	Addressed	Cognitive Level
CO - 1	Demonstrate the design and construction of home and public aquaria	PO 1, PSO 1	U
CO - 2	Explain setting and maintaining aquariums in addition to water quality management.	PO 2, PSO 1	U
CO - 3	Outline the handling and transport of aquarium fishes for trade and research purposes.	PO 1, PSO 1	U
CO - 4	Demonstrate the breeding, larval rearing and health management of freshwater ornamental fishes.	PO 1, PSO 1 PSO 3	U
CO - 5	Develop technical know-how for ornamental fish nutrition and disease management.	PO 1, PSO 1 PSO 3	AP

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	2	-	-	-	2	-	-	-
CO2	-	2	-	-	2	-	-	-
CO3	2	-	-	-	2	-	-	-
CO4	2	-	-	-	2	-	1	-
CO5	1	-	-	-	1	-	1	-
AVG CO	1.75	2			1.8		1	

**CO -PO-PSO Mapping - COURSE NAME: BREEDING AND REARING OF AQUARIUM FISHES (P)**

COURSE TITLE		BREEDING AND REARING OF AQUARIUM FISHES	
COURSE CODE		AQU02 – AQU4CRP0119	
CO No.	Course Outcomes	POs / PSOs Addressed	Cognitive Level
CO - 1	Identify fresh water and marine ornamental fishes, invertebrates and plants.	PO 1, PSO 1	U
CO - 2	Demonstrate the breeding and seed production of ornamental fishes.	PO 1, PSO 1 PSO3	U
CO - 3	Explain the concept of aquarium setting and maintenance.	PO 1, PSO 1	AP
CO - 4	Assess and maintain water quality and regular check on water quality parameters.	PO 1, PSO 1	U
CO - 5	Explain aquarium plant rearing and propagation and the role of aquarium plants in maintaining water quality in aquarium.	PO 1, PSO 1	U

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	2	-	-	-	2	-	-	-
CO2	2	-	-	-	2	-	2	-
CO3	2	-	-	-	2	-	-	-
CO4	2	-	-	-	2	-	-	-
CO5	2	-	-	-	2	-	-	-
AVG CO	2	-	-	-	2	-	2	-

**CO -PO-PSO Mapping - COURSE NAME: LARVAL NUTRITION AND CULTURE OF FISH FOOD ORGANISMS**

COURSE TITLE      LARVAL NUTRITION AND CULTURE OF FISH FOOD ORGANISMS			
COURSE CODE		AQU02 – AQU5CRT0119	
CO No.	Course Outcomes	POs / PSOs Addressed	Cognitive Level
CO - 1	Summarize the preparation, processing, formulation and proximate composition of feed.	PO 2, PSO 1 PSO 3	U
CO - 2	Assess various aspects related to physical properties of feed such as sinking velocity, bulk density, water absorption etc.	PO 1, PSO 1	U
CO - 3	Explain the culture of phytoplankton and zooplanktons.	PO 1, PSO 1	U
CO - 4	Indicate importance of the storage and feeding of live feeds.	PO 1, PSO 1	U
CO - 5	Describe the culture of artemia and periphyton.	PO 1, PSO 1	U

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	-	2	-	-	2	-	2	-
CO2	2	-	-	-	2	-	-	-
CO3	2	-	-	-	2	-	-	-
CO4	2	-	-	-	2	-	-	-
CO5	2	-	-	-	2	-	-	-
AVG CO	2	2	-	-	2	-	2	-

**CO -PO-PSO Mapping Fishery Microbiology**

COURSE TITLE		Fishery Microbiology	
COURSE CODE		AQU02 – AQU5CRT0119	
CO No.	Course Outcome	POs / PSOs Addressed	Cognitive Level
CO - 1	Explain the significance and incidence of microorganisms in fishery environment.	PO 1/ PSO 3	U
CO - 2	Identify different culture techniques and methods adopted in microbiology	PO 1/PSO 3	U
CO - 3	Describe the characteristics of food born and spoilage causing microorganism in fishery products.	PO 1/ PSO 3	U
CO - 4	Develop basic knowledge on the general principles of microbiology techniques.	PO 1/ PSO 3	U
CO - 5	Illustrate the life cycle of bacteriophage.	PO 1/ PSO 3	U

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	2	-	-	-	-	-	2	-
CO2	2	-	-	-	-	-	2	-
CO3	2	-	-	-	-	-	2	-
CO4	2	-	-	-	-	-	2	-
CO5	2	-	-	-	-	-	2	-
AVG CO	2	-	-	-	-	-	2	-

**CO -PO-PSO Mapping - COURSE NAME: FISHERY MICROBIOLOGY AND PATHOLOGY (P)**

COURSE TITLE		FISHERY MICROBIOLOGY AND PATHOLOGY	
COURSE CODE		AQU01- AQU5COC0119	
CO NO.	Course outcome	POs / PSOs addressed	Cognitive Level
CO-1	Illustrate the standard lab safety protocols and procedures	PO 4, PSO 3	AP
CO-2	Understand the practical skills in microscopy, their handling techniques and staining procedures.	PO 4, PSO 1	U
CO-3	Describe the total plate count and most probable number method to determine the quality of seafood.	PO 4, PSO 2 PSO 3	AP
CO-4	Explain the prophylactic and therapeutic measures including remedies with nutraceutical and immunostimulant formulations for the control of fish and shellfish diseases	PO 2, PO 3 PSO 3	U
CO 5	Illustrate the use of basic microbiological methods for the evaluation of the microbial load in the fish samples and water samples	PO 1, PSO 2 PSO 3	AP

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	-	-	-	2	2	-	-	-
CO2	-	-	-	2	2	-	2	-
CO3	-	-	-	2	2	-	-	-
CO4	-	2	-	-	2	-	-	-
CO5	2	-	-	-	2	-	-	-
AVG CO	2	2	-	2	2	-	2	-

**CO -PO-PSO Mapping – AQUAFARM MANAGEMENT (P)**

COURSE TITLE		AQUA FARM MANAGEMENT	
COURSE CODE		AQU02 – AQU5CRP0219	
CO No.	Course outcome	POs / PSOs Addressed	Cognitive Level
CO - 1	Ability to identify various commercially important shell fishes and fin fishes by using morphological characters	PO 1, PSO 1	U
CO - 2	Expertise in plankton identification methods.	PO 1, PSO 1	U
CO - 3	Mastery on hatchery operation and familiarity with equipment operation	PO 1, PSO 1	AP
CO - 4	Calculating nutrient requirement in feed formulation using standardized methods	PO 1, PSO 1	U
CO – 5	Ability to identify different live feed organisms.	PO 1, PSO 1	AP

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	2	-	-	-	2	-	-	-
CO2	2	-	-	-	2	-	-	-
CO3	1	-	-	-	2	-	-	-
CO4	2	-	-	-	2	-	-	-
CO5	2	-	-	-	2	-	-	-
AVG CO	1.8	-	-	-	2	-	-	-

**CO -PO-PSO Mapping – ON THE JOB TRAINING**

COURSE TITLE ON THE JOB TRAINING			
COURSE CODE		AQU03 – PAQ4OJT0119	
CO No.	Course Outcomes	POs / PSOs Addressed	Cognitive Level
CO - 1	Take part in the training of fish processing techniques and build technical knowledge in post-harvest technology.	PO 2/PSO 4	AP
CO - 2	Apply information and practical experience in quality check of fishery products.	PO 2/PSO 4	AP

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	-	2	-	-	-	-	-	3
CO2	-	2	-	-	-	-	-	3
AVG CO	-	2	-	-	-	-	-	3



**SEMESTER VI**

**CO -PO-PSO Mapping – FISHERIES MANAGEMENT**

COURSE TITLE		FISHERIES MANAGEMENT	
COURSE CODE		AQU02 – AQU6CRT0119	
CO No.		POs / PSOs Addressed	Cognitive Level
CO - 1	Explain the principles of management and the scientific techniques of management	PO 1, PSO 1	U
CO - 2	Define and use newly acquired terms and concepts related to fisheries and fisheries management	PO 1, PSO 1	R
CO - 3	Identify human resource management in the fisheries business environment.	PO 1, PSO1 PSO 4	U
CO – 4	Understand the principles of cooperatives, types of cooperatives, issues and their role in the development of the fisheries sector.	PO 1, PSO 1	U
CO - 5	Explain and compare the different approaches, techniques and measures employed to manage fish stocks in sustainable manner	PO 1, PO 3 PSO 1, PSO 4	U

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	2	-	-	-	2	-	-	-
CO2	2	-	-	-	2	-	-	-
CO3	1	-	-	-	1	-	-	1
CO4	1	-	-	-	1	-	-	-
CO5	2	-	1	-	2	-	-	1
AVG CO	1.6	-	1	-	1.6	-	-	1

**CO -PO-PSO Mapping – FISH PROCESSING TECHNOLOGY AND QUALITY CONTROL**

COURSE TITLE FISH PROCESSING TECHNOLOGY AND QUALITY CONTROL			
COURSE CODE		AQU02 – AQU6CRT0219	
CO No.	Course Outcome	POS / PSOs Addressed	Cognitive Level
CO - 1	Identify the problems associated with sea food processing and quality inspections.	PO 2, PSO 2	U
CO - 2	Develop various seafood processing techniques and seafood export documentation.	PO 2, PSO 2	AP
CO - 3	Analyse quality assurance and management of the system in seafood.	PO 2, PSO 2	AN
CO - 4	Differentiate fresh and spoilage seafood and the post mortem quality degradation in seafood.	PO 2, PSO 2	U
CO - 5	Explain the concept of HACCP	PO 1, PSO 2	U

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	-	3	-	-	-	3	-	-
CO2	-	2	-	-	-	2	-	-
CO3	-	3	-	-	-	3	-	-
CO4	-	2	-	-	-	3	-	-
CO5	1	-	-	-	-	2	-	-
AVG CO	1	2.5	-	-	-	2.6	-	-

**CO –PO-PSO Mapping – FISHERIES ECONOMICS AND MARKETING**

COURSE TITLE FISHERIES ECONOMICS AND MARKETING			
COURSE CODE		AQU02 – AQU6CRT0319	
CO NO.	Course Outcome	PSOs Addressed	Cognitive Level
CO - 1	Illustrate the importance of economics in aquaculture development.	PO 1, PSO 1	U
CO - 2	Demonstrate the ability to relate the socio-economics impacts with rural development.	PO 1, PSO 1	U
CO - 3	Explain the concept of marketing of fishery products and export earnings.	PO 1, PSO 2	U
CO – 4	Illustrate planning for fisheries development in the country.	PO 1, PSO 1 PSO 4	U
CO - 5	Explain the role and effectiveness of the fisheries cooperatives in the country.	PO 1, PSO 1	U

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	2	-	-	-	2	-	-	-
CO2	2	-	-	-	2	-	-	-
CO3	2	-	-	-	2	-	-	-
CO4	2	-	-	-	2	-	-	2
CO5	2	-	-	-	2	-	-	-
AVG CO	2	-	-	-	2	-	-	2

**CO -PO-PSO Mapping – FISHERY BY-PRODUCTS**

COURSE TITLE CHOICE BASED COURSE FISHERY BY – PRODUCTS			
COURSE CODE		AQU02 – AQU6CBT0219	
CO No.	Course Outline	POs / PSOs Addressed	Cognitive Level
CO - 1	Understand the preservation and processing of fishery products and their value additions	PO1, PO4 PSO2	U
CO - 2	Understand the spoilage associated with various fish products	PO4, PSO2	U
CO - 3	Understand the preparation of a number of other value added products such as pickles, wafers, chutney powders, steaks, cutlets etc. from fish or shrimp.	PO4, PSO2	AP
CO - 4	Understand the different fish preservation techniques to reduce post-harvest loss	PO1, PSO2	U
CO – 5	Understand the way to convert waste from fish processing, and Better utilization of fish processing waste	PO1, PO3 PSO2	U

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	2	-	-	2	-	2	-	-
CO2	-	-	-	1	-	1	-	-
CO3	-	-	-	2	-	1	-	-
CO4	2	-	-	-	-	1	-	-
CO5	1	-	1	-	-	1	-	-
AVG CO	1.66	-	1	1.66		1.2	-	-

**CO -PO-PSO Mapping - COURSE NAME: FISH PROCESSING AND QUALITY CONTROL (P)**

COURSE TITLE		FISH PROCESSING TECHNOLOGY AND QUALITY CONTROL	
COURSE CODE		AQU01 - AQU6CRP0119	
CO NO.	Course outcome	POs / PSOs addressed	Cognitive Level
CO-1	Demonstrate various equipment and usage of it in a fish processing lab.	PO 1, PSO 3	U
CO-2	Illustrate practical experiments on fish filleting and prawn pre-processing.	PO 6, PSO 3	AP
CO-3	Make up students to learn about freezing and drying principles.	PO 2, PSO 3	U
CO-4	Appraise students to know the approximation of the constituents present in the fish.	PO 8, PSO 3	U
CO-5	Demonstrate the preservation and processing of fishery products and their value additions	PO 1, PO 8 PSO 2	U

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	2	-	-	-	-	-	2	-
CO2	-	-	2	-	-	-	2	-
CO3	-	2	-	-	-	-	2	-
CO4	-	-	-	1	-	-	2	-
CO5	1	-	-	1	-	2	-	-
AVG CO	1.5	2	2	1	-	2	2	-

**CO -PO-PSO Mapping - COURSE NAME: WATER AND SOIL QUALITY PARAMETERS (P)**

COURSE TITLE		WATER AND SOIL QUALITY PARAMETERS	
COURSE CODE		AQU01 - AQU6CRP0219	
CO no.	Course outcome	POs / PSOs addressed	Cognitive Level
CO-1	Analysis of various physical, chemical and biological parameters of the water body.	PO 1, PSO 1	U
CO-2	Experiment with sampling and analyses soil and water quality required in environmental monitoring.	PO 1, PSO 1	AP
CO-3	Make use of contemporary tools and techniques required for environmental impact assessment.	PO 1, PSO 1	AP
CO-4	Summarize the importance of different water and soil quality parameters to convert aqua-farming operations into a profitable venture.	PO 1, PSO 1	U
CO-5	Explain the different aspects of water resource management, legal and economic issues associated with environmental hygiene.	PO 1, PSO 1	U

	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	2	-	-	-	2	-	-	-
CO2	2	-	-	-	2	-	-	-
CO3	2	-	-	-	2	-	-	-
CO4	2	-	-	-	2	-	-	-
CO5	2	-	-	-	2	-	-	-
AVG CO	2	-	-	-	2	-	-	-

PROGRAMME ARTICULATION MATRIX  
B.Sc. INDUSTRIAL FISHERIES (2019 SYLLABUS)

COURSE CODE	COURSE	SEME STER	PROGRAMME OUTCOMES				PROGRAMME SPECIFIC OUTCOMES			
			PO 1	PO 2	PO 3	PO 4	PSO 1	PS O 2	PS O 3	PSO 4
AQU1CR T0119	Biology of Fishes	I	1.75	1	-	-	-	-	1.6	-
AQU1CR T0219	Finfish and Shellfish Taxonomy	I	1.4	-	-	-	-	-	1.6	-
AQU1CR T0319	Freshwater Aquaculture	I	1.5	1.75	-	-	2	-	1	-
AQU1CR P0119	Taxonomy, Fishery Biology & Freshwater aquaculture	I	2	1	-	1	2	-	1.5	-
BCH1CMT O119	Elementary Biochemistry	I	2	-	-	-	-	-	1	-
ZOO1CM T0119	Non-chordate Diversity	I	2	-	-	-	-	-	1.8	-
AQU2CR T0119	Aquatic ecology	II	-	-	1.4	-	1.4	-	-	-
AQU2CR T0219	Fishing Technology	II	1.6	-	-	-	1.6	-	-	-
AQU2CR T0319	Brackishwater aquaculture and mariculture	II	1.4	-	2	-	1.4	-	-	-
AQU2CR P0119	Aquatic Ecology, Fishing Technology, Brackishwater Aquaculture and Mariculture	II	1.4	1	1	-	1.4	-	-	-
BCH2CM T0119	Biomolecules	II	2	-	-	-	-	-	1	-
BCH2CM P0119	Biomolecules	II	2	-	-	-	-	-	1	-
ZOO2CM T0119	Chordate Diversity	II	2	-	-	-	-	-	1.6	-

**PO, PSO & COS –B.Sc. Industrial Fisheries**

ZOO2CM P0119	Chordate Diversity	II	-	1.8	-	-	-	-	1.3	-
AQU3CR T0119	Inland and Marine Fisheries	III	1.5	2	1	2	2	-	1	1.5
AQU3CR T0219	Biostatistics and Computer Applications	III	2	1.4	-	-	-	-	-	1.4
AQU3CR T0319	Aquaculture Nutrition	III	2	-	-	-	1.8	-	-	-
AQU3CR P0119	Aquariculture, Biostatistics and Computer Applications	III	2	1.66	-	-	-	-	-	2
AQU3FW T0119	Freshwater Hatchery Training	III	-	3	-	3	1	3	-	-
BCH3CM T0119	Enzymology & Metabolism	III	2	-	-	-	-	-	1	-
ZOO3CM T0119	Human Physiology & Immunology	III	2	-	-	-	-	-	1	-
AQU4CR T0119	Genetics and Biotechnology	IV	2	-	-	-	1	-	1.8	-
AQU4CR T0219	Pathology in Aquaculture	IV	1.5	2	1	-	2	-	1.75	-
AQU4CR T0319	Aquariculture	IV	1.75	2	-	-	1.8	-	1	-
AQU4CR P0119	Breeding and rearing of Aquarium Fishes	IV	2	-	-	-	2	-	2	-
BCH4CM T0119	Nutritional & Clinical Biochemistry	IV	2	-	-	-	-	-	1	-
BCH4CM P0119	Nutritional & Clinical Biochemistry - Practical	IV	2	-	-	-	-	-	1	-
ZOO4CM T0119	Applied Zoology	IV	-	2	2	2	-	-	1.5	1
ZOO4CM P0119	Applied Zoology - Practical	IV	2	2	-	-	-	-	2	-
AQU5CR T0119	Larval Nutrition And Culture Of Fish Food Organisms	V	2	2	-	-	2	-	2	-
AQU5CR T0219	Fishery microbiology	V	2	-	-	-	-	-	2	-



**PO, PSO & COS –B.Sc. Industrial Fisheries**

AQU5CR P0119	Fishery microbiology and pathology	V	2	2	-	2	2	-	2	-
AQU5CR P0219	Aquafarm management	V	1.8	-	-	-	2	-	-	-
AQU5OJ T0119	On the job training	V	-	2	-	-	-	-	-	3
AQU5CO T0219	Value Added Fishery Products	V	1	2.5	-	-	-	2.6	-	-
AQU6CR T0419	Fisheries Management	VI	1.6	-	1	-	1.6	-	-	1
AQU6CR T0519	Fish Processing Technology and Quality Control	VI	1	2.5	-	-	-	2.6	-	-
AQU6CR T0619	Fishery Economics and Marketing	VI	2	-	-	-	2	-	-	2
AQU6CR P0119	Fish Processing Technology and Quality Control	VI	1.5	2	2	1	-	2	2	-
AQU6CR P0219	Water and Soil Quality Parameters	VI	2	-	-		2	-	-	-
AQU6CB T0219	Fishery By Products	VI	1.66	-	1	1.66		1.2	-	-



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