

Department of Fisheries

FACULTY OF SCIENCE

UNIVERSITY OF JAFFNA

SRI LANKA

2016/2017

**Curriculum for
Bachelor of Science in Fisheries Science**

LEVEL 1G

Effective from June, 2018

Course Code	Course title	Lectures (hrs)	Practical & Field work (hrs)	Credit value
LEVEL 1G				
FIS101G2	Principles of Fisheries	30	-	2
FIS102G2	Fish Evolution and Diversity	20	24	2
FIS103G2	Marine & Coastal Environment and Oceanography	20	24	2
FIS104G2	Introductory Aquaculture	20	24	2
FIS105G2	Ornamental Fish / Plant Culture and Fish Feeds	20	24	2
Sub Total – Level 1G				10

Note: For those course units amalgamated with practical and theory, students should obtain at least a D+ grade in each, theory component and the practical component to secure any grade higher than 'E'.

Level 1G

Level	1		
Course Title	Principles of Fisheries		
Course Code	FIS 101G2		
Credit Value	2		
Hourly Breakdown	Theory	Practical	Independent Learning
	30	----	70
Objectives:			
<ul style="list-style-type: none"> • Provide the fundamental knowledge on principles of fisheries • Introduce the impacts of fisheries on fish populations 			
Intended Learning Outcomes (ILO):			
<ul style="list-style-type: none"> • List the components of fishery • Outline the general knowledge on fish biology • Define the fundamental terms in Fisheries Science • Explain direct and indirect impacts of fisheries on fish populations and exploited food-webs • Discuss the important aspects related to Fisheries Science • Analyze the fish productivity and trend of fish production in World and Sri Lanka 			
Course Contents:			
<p>Component of Fisheries: Fish, Fishermen, Fishery. Fish and Fishes; Principle of Fish biology, Life Cycle of a fish. Fishing crafts and gears; Traditional, motorized and mechanized fisheries according to major gears. Classification of Fisheries. Overview of aquatic resources of the world and Sri Lanka. Potential of Aquatic resources; Major riverine and estuarine systems; Major brackish water lakes and their fisheries; Fisheries of major reservoirs. Potential of the Sri Lanka's EEZ. Classification and definition of fishery zones and fishery resources of world. The concept of population and unit stock. Biological structure of fisheries resource in space and time. Indicators of dynamics in a fishery resource. Data requirements for stock assessment. Principles of stock assessment.</p>			
Teaching and Learning Methods:			
Lecture presentation, Group activity, Recitation oral questions, Class projects, Tutorial discussion, Problem solving sessions			
Assessment Strategy:			
In – course assessment/s :		30%	
End of Course Examination of two hours duration (Expected to answer four out of six questions)		70%	
References:			
<ul style="list-style-type: none"> • <i>Handbook of Fish Biology and Fisheries</i>, Paul J.B.H. and John D. R., 2004. Blackwell publishing. 			

Level	1		
Course Title	Fish Evolution and Diversity		
Course Code	FIS102G2		
Credit Value	2		
Hourly Breakdown	Theory	Practical	Independent Learning
	20	24	54
Objectives:			
<ul style="list-style-type: none"> • Provide information on systematics, anatomy and morphology of fish • Familiarize with the evolutionary origins of finfishes 			
Intended Learning Outcomes (ILO):			
<ul style="list-style-type: none"> • Explain the origin of fish with geological time scale • Examine fish species through observation and description in order to classify the fishes • Compare and contrast the anatomical and morphological diversity among fishes • Survey the diversity of biological adaptations of fossil fishes • Evaluate the evolutionary adaptations of commercially important bony fishes • Support the adaptations found in fishes to survive in different habitats 			
Course Contents:			
Origin and evolution of fishes, Pre Devonian origin of fish, Devonian, Post Devonian, Geologic time scale, Systematics, Anatomy and Morphology, Diversity in structure and habit of fish and their adaptations; Evolutionary adaptations of commercially important bony fishes; Fossil records; Cartilaginous and bony fishes; Main features of pelagic, mid-water and deep sea fishes and their adaptations.			
Teaching and Learning Methods:			
Lecture presentation, Group activity, Recitation oral questions, Class projects, Tutorial discussion, Problem solving sessions and computer labs.			
Assessment Strategy:			
Theory:			
In – course assessment/s:		30%	
End of Course Examination of two hours duration (Expected to answer four out of six questions)		70%	
Practical/ Field work:			
In – course assessment/s:		30%	
Spot exam /Recording / Field Report / Field assessment		30%	
End Course Examination of two hours duration		70%	
Overall mark for the unit = (3MT + 2MP)/ 5 Where MT and MP are the marks scored for theory and practical / field work respectively.			
References:			
<ul style="list-style-type: none"> • <i>The Diversity of Fishes: Biology, Evolution, and Ecology</i>, Gene Helfman, Bruce B. Collette, Douglas E. Facey, Brian W. Bowen. 2009. 2nd Edition. • <i>The diversity of fishes</i>, Helfman, G. 2010., Oxford: Wiley-Blackwell. • <i>Fishes of the World</i>, Nelson, J. 2016., 5th Edition. John Wiley & Sons. 			

Level	1		
Course Title	Marine and Coastal Environment and Oceanography		
Course Code	FIS103G2		
Credit Value	2		
Hourly Breakdown	Theory	Practical	Independent Learning
	20	24	54
Objectives:			
<ul style="list-style-type: none"> • Introduce the fundamental knowledge on components of marine ecosystem with physical and chemical process • Know oceanographic concepts related to fisheries • Impart skills to operate oceanographic equipment 			
Intended Learning Outcomes (ILO):			
<ul style="list-style-type: none"> • Define and explain the components of marine ecosystem • Analyze the physico-chemical parameters of the marine environment in the field visit • Discuss the major source of marine pollution • Compile the knowledge on distribution of environmental parameters • Elaborate ecological changes in oceanic environment • Test the environmental conditions 			
Course Contents:			
Origin and history of the ocean; Marine ecosystems; Classification and Zonation; Submarine geomorphology; Physical, chemical and biological properties of sea water; Sampling and sampling equipment; Methods and instrumentation; Marine communities; Collection, identification and preservation techniques; Major sources of pollution; Pollution of coastal and marine water bodies; Up-welling and productivity in sea ; Water currents and fish movements; Thermocline and fish distribution; Temperature and salinity distribution; Sea Surface Temperature and Chlorophyll distribution; Lagoons and estuaries and their classification; Large Marine Ecosystems (LMEs)			
Teaching and Learning Methods:			
Lecture presentation, Laboratory experiment, Field work, Group activity, tutorial discussion, spot exam, recording			
Assessment Strategy:			
Theory:			
In – course assessment/s:			30%
End of Course Examination of two hours duration (Expected to answer four out of six questions)			70%
Practical/ Field work:			
In – course assessment/s:			
Spot exam /Recording / Field Report / Field assessment			30%
End Course Examination of two hours duration			70%
Overall mark for the unit = (3MT + 2MP)/ 5 Where MT and MP are the marks scored for theory and practical / field work respectively.			
References:			
<ul style="list-style-type: none"> • <i>Essentials of Oceanography</i>, Alan P. T. and Harold, V. T. 2007. Prentice Hall. • <i>Coastal Environments and Global Change</i>, Gerd, M. and Roland G. 2014. Wiley. 			

Semester	1		
Course Title:	Introductory Aquaculture		
Course Code:	FIS104G2		
Credit Value:	2		
Hourly Breakdown	Theory	Practical	Independent Learning
	20	24	54
Objectives:			
<ul style="list-style-type: none"> • Impart basic knowledge in aquaculture production systems • Introduce the design, construct, operate and maintain aquaculture facilities 			
Intended Learning Outcomes (ILO):			
<ul style="list-style-type: none"> • Recall the cultivable species and their biology • Define and explain the principles of aquaculture • Categorize the types of aquaculture practices • Explain different techniques involved in aquaculture practices • Appraise best management practices in aquaculture • Design an eco-friendly aquaculture in selected site 			
Course Contents:			
<p>Role of aquaculture in sustaining food security and livelihoods; Types of aquaculture practices; History and status of aquaculture in the world; Asian region and Sri Lanka; Aquaculture resources; Culturable indigenous and exotic species; Pond culture; Water quality parameters in aquaculture; Site selection; Selection of species; Control of pests and predators; Culture of some important invertebrates for fish food – blood worms, artemia, moina etc.; Harvesting techniques; Hatchery and transport techniques; Best Management Practices (BMPs) in aquaculture; Fattening of commercially important species; Culturing marine animals in pens and cages; Integrated farming; Sea ranching; Culturing aquatic animals in ponds; Aquaculture and environment; Inland fisheries enhancement; Culture based fisheries</p>			
Teaching and Learning Methods:			
Lecture presentation, Field work, Laboratory experiment, Group activity, spot exam, problem solving, tutorial discussion			
Assessment Strategy:			
Theory:			
In – course assessment/s:			30%
End of Course Examination of two hours duration (Expected to answer four out of six questions)			70%
Practical/ Field work:			
In – course assessment/s:			
Spot exam /Recording / Field Report / Field assessment			30%
End Course Examination of two hours duration			70%
Overall mark for the unit = (3MT + 2MP)/ 5 Where MT and MP are the marks scored for theory and practical / field work respectively.			
Reference:			
<ul style="list-style-type: none"> • <i>Aquaculture: An Introductory</i>, Robert R. S. 2017. CABI 			

Semester	1		
Course Title:	Ornamental fish / plant culture and fish feeds		
Course Code:	FIS105G2		
Credit Value:	2		
Hourly Breakdown	Theory	Practical	Independent Learning
	20	24	54
Objectives:			
<ul style="list-style-type: none"> • Introduce various techniques of ornamental fish and plant culture • Create basic understanding on the nutritional requirements of fish/shellfish • Introduce the fish feed manufacture 			
Intended Learning Outcomes (ILO):			
<ul style="list-style-type: none"> • Name ornamental fish species and plants • Demonstrate culture techniques for ornamental fish and plants by observing an ideal farm in Sri Lanka • Recognize ornamental fishery resources and industry in Sri Lanka • Distinguish the techniques involved in ornamental fish or plant culture • Organize the methods for formulation of feed for culture of fish • Plan the techniques involved in processing and storing of fish 			
Course Contents:			
<p>Present status of world ornamental fish industry; Sri Lankan ornamental fish industry; Important species of ornamental fishes; aquatic plants; Design and construction of an aquarium; Propagation of aquarium plants; Culture techniques and tissue culture; Soft coral propagation; Export and import requirement; Acclimatization, packing and transport; Chemical composition and nutritive value of fish and shell fish types; Feed formulation and analysis; Processing and storing of fish; Evaluation and standardization of diets; Live feeds; Artificial feeds and their preparation techniques; Feeding regimes; Feed stimulants.</p>			
Teaching and Learning Methods:			
Lecture presentation, Group activity, tutorial discussion, industrial visit, panel discussion, presentation, viva			
Assessment Strategy:			
Theory:			
In – course assessment/s:			30%
End of Course Examination of two hours duration (Expected to answer four out of six questions)			70%
Practical/ Field work:			
In – course assessment/s:			
Spot exam /Recording / Field Report / Field assessment			30%
End Course Examination of two hours duration			70%
Overall mark for the unit = (3MT + 2MP)/ 5 Where MT and MP are the marks scored for theory and practical / field work respectively.			
References:			
<ul style="list-style-type: none"> • <i>Ornamental Fish Culture and Aquarium Management</i>, A D. Dholakia, 2010. Daya Publishing House 			