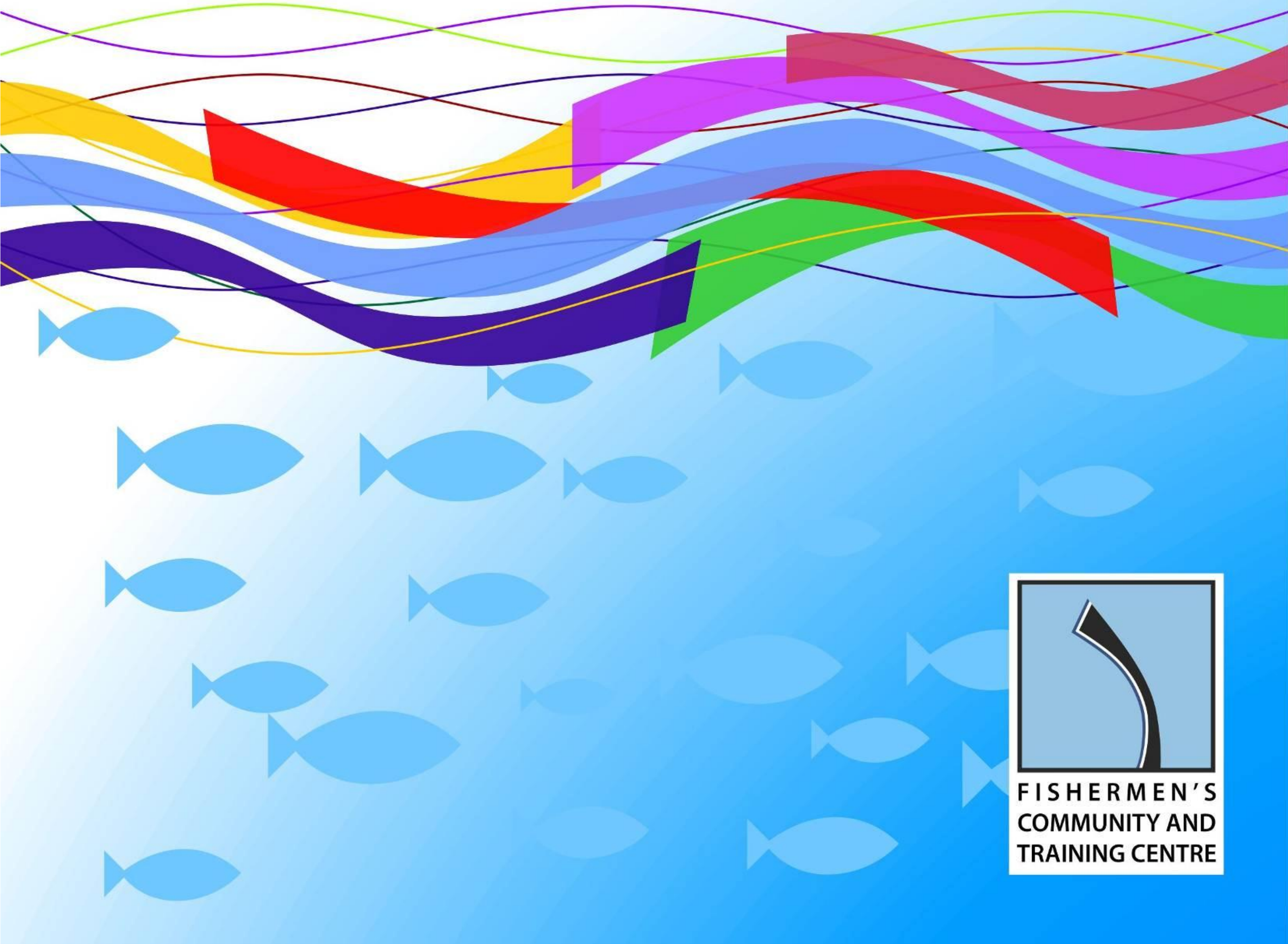
IPNLF
INTERNATIONAL POLE
& LINE FOUNDATION

FISHERMEN'S ASSOCIATION
MALDIVES

Fishing Skipper (Master Fishermen)
Certificate Level IV
Course Curriculum



FISHERMEN'S
COMMUNITY AND
TRAINING CENTRE

The curriculum – Fishing Skipper Certificate Level IV – has been produced as part of the Fishermen Community Training Centre (FCTC) Project executed in the Maldives from 2013-2015 by the International Pole & Line Foundation (IPNLF) with support from Migros Engagement Fund and implemented by Maldives Fishermen's Association (MFA).

The curriculum was conceived from a series of pilot training activities and classroom courses conducted to the Maldivian fishermen ranging from safety at sea, navigation, engine repair and maintenance, best practices of livebait loading and holding methods, on board fish handling among several others. A formal stakeholder consultation, as required by the Maldives Qualification Authority, was held to present and discuss the initial draft. The comments and feedback of participants were incorporated into the final document before it was submitted for MQA approval.

The curriculum 'Fishery Skipper Certificate - Level 4' is registered under the Fishery Community Training Centre (FCTC), Malé, Republic of Maldives.

The ownership of the Curriculum is vested with the International Pole & Line Foundation. Parties wishing to provide training based on this Fishing Skipper Certificate Level IV shall contact the International Pole & Line Foundation for their approval prior to the delivery of training.

International Pole & Line Foundation (IPNLF)
February 2015

The International Pole & Line Foundation (IPNLF) works to develop, support and promote socially and environmentally responsible pole-and-line and hand-line tuna fisheries around the world. IPNLF's ambition is to contribute to thriving coastal fisheries, including the people, communities, businesses and seas connected with them.

As a hub for sustainably-minded organisations, we use the influence of the market to forge change through practical fishery projects and stakeholder cooperation. IPNLF membership is open to organisations involved in the pole-and-line tuna supply chain, from fishing associations to suppliers, to retailers. Allied with our members, we demonstrate the value of pole-and-line tuna to consumers, policy-makers and throughout the supply chain.

We work across science, policy and the seafood sector, using an evidence-based, solutions-focused approach with guidance from our Scientific & Technical Advisory Committee and Board of Trustees.
IPNLF was officially registered in the United Kingdom in 2012 (Charity 1145586), with branch offices in London and the Maldives, and a staff presence in Indonesia.

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FISHERMEN'S
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FISHING SKIPPER

Certificate IV

Course Approval Document

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INTERNATIONAL POLE
& LINE FOUNDATION

FISHERMEN'S ASSOCIATION
MALDIVES

1. Admission requirement

1.1 Academic requirement:

Successful completion of lower secondary education or Maldives National Qualification Framework (MNQF) level 3 qualification in a relevant field.

1.2 Experience-related requirement:

Mature candidates older than 18 years of age, completed basic education and had 1 year work experience in working on a pole-and-line fishing vessel in the Maldives.

2. Course content

2.1 Goals of the course:

- Ensure that the captain of every tuna fishing vessel operated in the Maldives is competent in handling the vessel in any situation while out fishing.
- Provide safety and manage the crew working on tuna fishing vessels operated in the Maldives.

2.2 Objectives of the course:

Level descriptor domains / Subjects leading to specific learning outcomes	Knowledge and understanding	Practice: Applied knowledge and understanding	Generic cognitive skills	Communication, ICT and numeracy skills	Autonomy, accountability and working with others
1: Determine position and safely navigate in the Maldives EEZ					
a) Identify the types of reefs in the Maldives	x		x		
b) Describe the structure of atoll in the Maldives	x	x	x		
c) Explain the formation of the Maldives	x	x	x		
d) Locate from a map various atoll, channels, atoll capitals, inhabited and highly populated islands across the Maldives	x	x	x	x	
e) State specific features of the Maldives atolls	x		x		
f) List all the Nakaiy of both monsoons	x		x		
g) Describe the fishing activities related to Nakaiy	x	x	x		

h) Explain the changes in weather, wind and current related to monsoons	x	x	x		
i) States the requirements of a chart appropriate for marine navigation	x	x	x		
j) Recognize and demonstrates the use of the symbols and abbreviations on a chart, especially dangers and obstructions, lighthouses, buoys, beacons, radio beacons and other navigational marks	x	x	x	x	x
k) Identifies the characteristics and range of lights	x	x	x		
l) Recognizes coastlines, coast and radar-responsive targets	x	x	x		x
m) Interprets coastline contours, bottom topography, depths and nature of bottom	x	x	x		x
n) Uses tidal information given on a chart		x			x
o) Explains the danger of approaching navigational aids too closely	x		x		
p) Read nautical charts used in the Maldives	x		x		
q) Handle sextant appropriately	x		x		x
r) Describe the use of sextant	x		x		
2: Understand ocean productivity and oceanographic factors that affect fisheries					
1. Identify feature of the marine environment	x		x		
2. Understand the structures of the earth and how these structures are formed	x		x		
3. Understand the importance of coral reefs and its role in formation of atolls	x	x	x		
4. Know and understand the monsoons in the Indian Ocean region	x	x	x	x	x
5. Understand the physical and chemical properties of the world oceans and discuss how it affects the organisms	x	x	x	x	x
6. Identify and distinguish organisms in the marine	x	x	x	x	x

environment					
7. Understand adaptations of organisms and know how they are inter-related	x	x	x	x	x
8. Explain the productivity of the marine environment	x	x	x		
9. Collect plankton and observe planktons under the microscope	x	x	x	x	x
10. Find the salinity and density of seawater by evaporation	x	x	x	x	x
11. Find the behaviour of hot and cold water when they are mixed	x	x	x	x	x
12. Find the behaviour of fresh and salt water when they are mixed	x	x	x	x	x
13. Observe effect of wind on thermocline with the help of improvised equipment	x	x	x	x	x
14. Observe the penetration of light at sea	x	x	x	x	x
3: Understand tuna fisheries in the Indian Ocean					
1. Identify different species of tuna	x	x	x		
2. Describe the external and internal features of tuna	x	x	x	x	x
3. Dissect the different tuna species and observe the internal organs	x	x	x	x	x
4. Measure the fecundity of yellowfin tuna or skipjack tuna	x	x	x	x	x
5. Describe lifecycle and behavior of tuna	x	x	x		
6. Explain tuna fishing methods in the Indian Ocean	x	x	x		
7. Identify common livebait species used in the tuna fishery	x	x	x	x	x
8. Explain livebait fishing related to tuna fishery	x	x	x		
9. Tie essential knot on fishing line and ropes	x	x	x	x	x
4: Develop skills necessary for tuna fishery management					
1. Describe major tuna fisheries of the world	x	x	x		
2. Understand and demonstrate fisheries quota	x	x	x	x	x

settings related to management					
3. State the importance of obtaining data for fishery management	x	x	x		
4. Apply international standards and codes of conduct to fisheries management	x	x	x	x	x
5. Relate the importance of fishing to food security and sustainable livelihoods	x	x	x	x	x
6. Discuss various management regimes implemented across the world to manage fish stocks	x	x	x	x	x
7. Debate on the fisheries management strategies of the Maldives	x	x	x	x	x
8. Explain fisheries law in the Maldives	x	x	x		
9. Explain the challenges in fisheries management	x	x	x	x	x
10. Debate on the global issues related to fishery management	x	x	x	x	x
11. Develop a management plan for managing one of the fisheries in the Maldives	x	x	x	x	x
12. Outline the benefits of marine reserves for fisheries	x	x	x	x	x
13. Explain the impacts of IUU fishing	x	x	x	x	
14. Outline the role of RFMO in fishery management	x	x	x		
15. Discuss the importance in participating IOTC for managing migratory species such as tuna	x	x	x	x	x
16. Compare the management strategies implemented in the Maldives	x	x	x	x	x
17. Brainstorm on the challenges facing authorities in fishery management in the Maldives	x	x	x	x	x
18. Describe the role of fishers in contributing to the management of resources	x	x	x	x	x
19. Outline the benefits of proper management of fishery resources	x	x	x		
20. Describe the importance of fisheries research for management	x	x	x	x	x

5: Handle fresh fish					
1. Distinguish between fresh and spoilt fish	x	x	x	x	x
2. Describe two main food spoilage agents and their characteristics	x	x	x		
3. Describe the four main types of spoilage which affect fish after they die	x	x	x		
4. Describe food related diseases with reference to food poisoning	x	x	x		
5. Demonstrate good fish handling practices	x	x	x	x	x
6. Outline the criteria for good handling practice to reduce spoilage	x	x	x		
7. Handle fish appropriately to reduce spoilage	x	x	x	x	x
8. Prepare an ice slurry for reducing fish spoilage	x	x	x	x	x
9. Calculate the amount of ice required to chill fish	x	x	x	x	x
6: Marine engines and electronics					
1. Identify different parts of the engine	x	x	x	x	x
2. Describe the working principles of 2 and 4 stroke engines	x	x	x		
3. Identify faulty engine parts	x	x	x	x	x
4. Carryout simple repair on marine engines, generator and electronic equipment on board the fishing vessel	x	x	x	x	x
5. Change filters, lubricating oil and coolant	x	x	x	x	x
6. Conduct regular maintenance checks	x	x	x	x	x
7. Service battery	x	x	x	x	x
8. Take proper precautions in handling electrical equipment	x	x	x	x	x
9. Maintain a log of running for engine and generator	x	x	x	x	x

Schedule of units

The units can be taught in any sequence. By the completion of each Unit a certificate will be provided acknowledging the successful completion of the unit by the training provider.

	Title
1	Determine position and safely navigate in the Maldives EEZ
2	Understand ocean productivity and oceanographic factors that affect fisheries
3	Understand tuna fisheries in the Indian Ocean
4	Develop skills necessary for tuna fishery management
5	Handle fresh fish
6	Conduct simple maintenance of marine engines and electronic equipment
7	Practice safety at sea

Pre-requisites for the course

It is mandatory for the participant to complete these courses before enrolling to the Master Fishermen course.

1. Certificate II in Marine Operations / Coastal (Skipper class V) (40 credits)
    a. Personal survival techniques (3 credits)
    b. Fire prevention and fire fighting (3 credits)
    c. Elementary first aid (3 credits)
    d. Personal safety and social responsibility (3 credits)
    e. Passenger safety and proficiency in ship security awareness (3 credits)

Co-requisites for the course

1. Crisis management
2. Marine environment awareness

Summary of course structure

Titles	Credits	Contact hours	Learning hours
Determine position and safely navigate in the Maldives EEZ	6	20	60
Understand ocean productivity and oceanographic factors that affect fisheries	15	50	150
Understand tuna fisheries in the Indian Ocean	15	50	150
Develop skills necessary for tuna fishery management	15	50	150
Handle fresh fish	10	34	100
Conduct simple maintenance of marine engines and electronic equipment	6	20	60
Personal survival techniques	3	10	30
Fire prevention and fire fighting	3	10	30
Elementary first aid	3	10	30
Personal safety and social responsibility	3	10	30
Passenger safety and proficiency in ship security awareness	3	10	30
Crisis management			
Marine environment awareness			
Certificate II in Marine Operations / Coastal (Skipper class V)	40	134	400
Total	122	408	1220

2.3 Method/Process utilized in course content development

Maldivian fishers have been exploiting tuna resources in the Indian Ocean for hundreds of years. The tuna fishery in the Maldives started as a small scale fishery which operated in the coastal waters very close to the atolls. Small sailing vessels that heavily depended on wind were used for pole-and-line operations and only a few hundred tons of tuna were caught every year. The vessels left port during the early morning hours and returned by late afternoon or evening.

Over the years the tuna fishery in the Maldives has expanded and the fishery has shifted from a traditional coastal fishery to a more modern commercial fishery. Larger motorized vessels with modern navigation equipment have transformed the fishing operation. Many vessels are nearly 100 feet long, carry large quantities of fuel and ice so that they could stay out at sea for several days. It is now common practice to operate in any part of the Maldives EEZ where fishing is good. The Maldives tuna fishery today is no longer a coastal fishery and the catch has also increased to thousands of tons per year.

With the expansion of the fishery, increase in size of the vessels and the change in fishing practices it has now become essential that the captains of these vessels undertake relevant training to safely operate these vessels on the high seas. Proper navigation and boat handling skills are essential for all captains who are responsible for the safety of both the vessels and its crew. This course is designed to provide these essential skills that a master fisherman must have in order to operate a tuna fishing vessel in the Maldivian EEZ.

The competencies were identified through the analysis of the tasks that a captain of a tuna fishing vessel needs to undertake in the Maldives. This was done by speaking with the fishermen and the experts from the sector. In addition discussions were held with relevant institutions that conduct similar trainings and competency standards from similar trainings conducted in other parts of the world were examined too. The following professionals assisted in identifying and endorsing the competencies and tasks necessary for the Master Fishermen course during the one day symposium held in Male'.

Name	Profession	Institution/Company
Capt. Adil Rasheed	Educational Program Director	Maritime Academy of Maldives
Ahmed Musthafa	Coordinator	Maritime Academy of Maldives
Cpt. Qasim Mohamed Fulhu	Head of Centre	Centre for Maritime Studies
Dr. Shazla Mohamed	Dean	Faculty of Science
Moosa Satheesh	Microbiologist	MFDA
Ali Ahthar	Lab Technologist	MFDA
Abdul Latheef Abdulla	Staff Sergeant	Marine Police
Zaheer Easa	Staff Sergeant	Marine Police
Mohamed Ziyau	Warrant Officer	MNDF
Ahmed Faizan	1st Lieutenant	MNDF
Hassan Khaleel	Senior Engineer	MTCC

Ahmed Zakee	Service Engineer	MTCC
Hafzath Ahmed	Asst. Production Manager	ENSIS
Mohamed Sinan	Electrical Technician	ENSIS
Dr. Mohamed Shiham Adam	Director General	MOFA / MRC
Mohamed Ahsan	Research Officer	MOFA / MRC
Fahmeedha Ismail	Senior Research Officer	MOFA / MRC
Ahmed Riyaz Jauhary	Senior Research Officer	MOFA/ MRC
Dr. Abdulla Naseer	Permanent Secretary	MOFA
Adam Ziyadh	Senior Research Officer	MOFA
Ahmed Shifaz	Senior Research Officer	MOFA
Adam Manik	Deputy Director General	MOFA
Nazim Moosa	Asst. Policy Analyst	MOFA
Ahsan Mohamed	Program Officer	MOFA
Ibrahim Fikree	Asst. Project Officer	MOFA
Capt. Mohamed Shareef	Lecturer	MFA
Maizan Ahamed Manik	Chairman	MFA
Abdulla Shakir Mohamed	Secretary General	MFA
Hassan Ali	Manager	Maizan Electronics
Ibrahim Azleem	Manager / Marketing	Maizan Electronics
Abdulla Yaman	Fisherman	
Aishath Samaha	Senior Admin Officer	MQA
Fathimanth Muzna	Senior Admin Officer	MQA
Ahmed Ahsan	Admin Officer	MQA
Azha Zameer	Senior Admin Officer	MQA
Ahmed Zareer	Manager	MIFCO
Hussain Habeeb		MIFCO
Mohamed Rameez	Senior Research Officer	EPA

Mode of delivery

Lecture, group work, practical, hands on experience, field work and workshops.

Purpose of the qualification

Holders of this qualification will have the necessary skills and knowledge required to operate a tuna fishing vessel in the Maldivian waters.

3. Instruction and academic staffing

3.1 Course coordinator

3.1.1. Course coordinator must have a first degree in Education.

3.1.2. The course coordinator must ensure that the classes are conducted regularly according to schedule, teachers conduct lectures, appropriate practical activities, field work and students attendance. Obtain feedback from students and provide a synthesis of the feedback to the lecturers.

3.2 Teaching staff

3.2.1. Lecturers from the relevant field will be hired to conduct the training. In addition students will be sent to institutions where mandatory short courses are offered/taught by relevant experts in that field.

3.2.2. Every module will be taught by a graduate in the relevant field.

3.2.3. Lecturers are responsible for delivering the content, conducting the practical work and field work related to the subject. They are also responsible to keep an attendance of the students and conduct the relevant assessment during the training.

3.3 Staff performance appraisal

3.3.1. Questionnaire on teaching staff performance will be implemented by the course coordinator by the end of teaching period for every subject. Student anonymity will be kept confidential.

4. Student assessment

4.1 Academic progress

Students will be assessed through continuous testing, practical work, assignments and final examination. Feedback on the continuous assessments will be provided withing a week of submission of the assessed work. Those who have more than 85% attendance will be eligible to take part in the examination.

4.2 Graduation requirements

Competent students who have a pass at above 70% in all the subjects of this course will be awarded Certificate IV in Master Fisherman.

4.3 Policy on academic dishonesty and plagiarism

"*Plagiarism is the presentation by a student of an assignment which has in fact been copied in whole or in part from another student's work or from any other source (e.g. Published books, periodicals), without due acknowledgement in the text*."

"*Collusion is the presentation by a student of an assignment as his or her own which is in fact the result in whole or part of unauthorized collaboration with another person or persons*."

Those who engage in academic dishonesty or plagiarism will be penalised severely. They will be awarded zero for any such work.

Late submissions of practical reports, field reports or any assignment, will receive a 5% penalty per every 24 hours from due date.

Students who wish to seek an extension of time to complete an assessment item or defer a performance assessment must make a formal application in writing before the due date to the lecturer, stating in full the reasons for the application.

If special consideration is to be granted on medical grounds for any assessment component or attendance, an appropriate medical certificate must be provided to the course coordinator within 3 working days. No special consideration will be provided if the MC is not submitted on time.

5. Student Withdrawal

5.1 The policy on the withdrawal of a student based on poor attendance, weak academic performance and/or misconduct

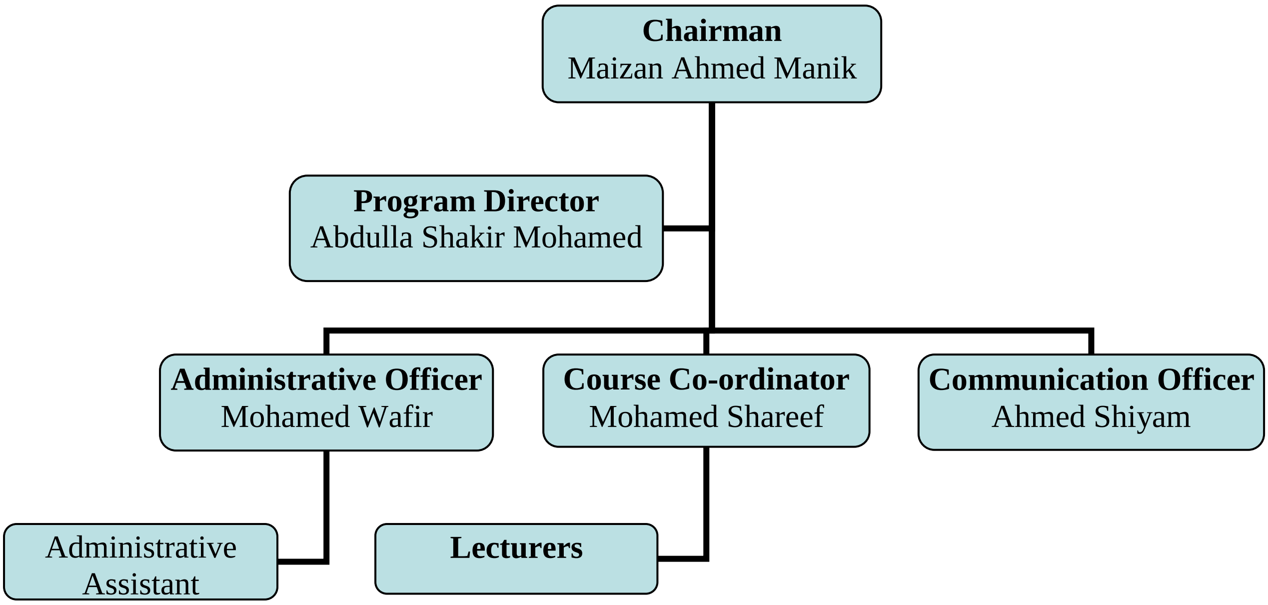
All students are required to attend atleast 80 percent of the contact hours highlighted under each subject. Students who are unable to fulfill this requirement will not be certified under this curriculum. If for any reason the student is unable to attend any class or practical session he/she must inform with a valid reason to the course coordinator atleast 2 hours prior to the class.

5.2 The policy on voluntary withdrawal and tuition fee reimbursement.

If a student wants to withdraw from the course at any given time without a valid reason the student will have to reimburse 70% of the course fee. And if the student wishes to withdraw for any valid reason he/ she must write to the course co-ordinator and get a written approval.

6. Institutional Capacity and Management

6.1 The organizational-chart, including management functions/units, key management staff names and titles, academic departments/units and the number of academic and administrative/support staff



Note: Lecturers will be hired on need basis for the modules of each training program.

6.2 Relevant facilities and resources

6.2.1 Furnished classrooms

We have one class room in our training centre located at Laamu Atoll Gan. And as the target audience is fishermen our main programs will be conducted on mobile training basis on fishing islands. We will also be establishing a training facility at Male' Villingili and this facility will have two training class rooms/ hall, fish processing laboratory and workshops, computer room and a library

6.3 Briefly explain the setup of the internal supervion or quality assurance mechanism.

All technical, academic and administrative staff will be supervised and will go through a yearly evaluation process to assure the quality of the staff and will be provided with necessary trainings and support facilities. Also allfacilities will be monitored and maintained in accordance with the internal policies.

Section 7: Subject outlines

Subject name: Determine position and safely navigate in the Maldives EEZ

Credits: 6 Independent learning hours: 60 hours Contact hours: 20 hours

Mode of delivery: Lecture, group work, field work and workshops

Minimum qualification of the instructor/lecturer: Bachelors degree in the relevant field

Pre-requisites: Certificate II in Marine Operations / Coastal (Skipper class V)

Co-requisites: Nil

Expected learning outcomes:

The study of this unit will enable Participants to:

1. Identify the types of reefs in the Maldives
2. Describe the structure of atoll in the Maldives
3. Explain the formation of the Maldives
4. Locate from a map various atoll, channels, atoll capitals, inhabited and highly populated islands across the Maldives
5. State specific features of the Maldives atolls
6. List all the Nakaiy of both monsoons
7. Describe the fishing activities related to Nakaiy
8. Explain the changes in weather, wind and current related to monsoons
9. States the requirements of a chart appropriate for marine navigation
10. Recognize and demonstrates the use of the symbols and abbreviations on a chart, especially dangers and obstructions, lighthouses, buoys, beacons, radio beacons and other navigational marks
11. Identifies the characteristics and range of lights
12. Recognizes coastlines, coast and radar-responsive targets
13. Interprets coastline contours, bottom topography, depths and nature of bottom
14. Uses tidal information given on a chart
15. Explains the danger of approaching navigational aids too closely
16. Read nautical charts used in the Maldives
17. Handle sextant appropriately
18. Describe the use of sextant

Curricular content:

Main topics	Content details
The Maldives Atolls (6 hours)	• Types of reefs and structure of atolls • Formation of the Maldives • Identification of atolls – shapes and names • Main channels across the Maldives

	• Main islands – atoll capitals, inhabited islands, largest islands and highly populated islands • Special features of atolls – average depth, sea mounts, protected areas
Nakaiy (4 hours)	• Northeast monsoon (Iruvai moosun) • Southwest monsoon (Hulhangu moosun) • Wind and sea current pattern • Relation to fishing activities • Relation to weather
Nautical charts and publication – Restricted to Maldives (12 hours)	• International code of signals • Noris Table • Nautical almanac • States the requirements of a chart appropriate for marine navigation • Symbols and abbreviations on a chart, especially dangers and obstructions, lighthouses, buoys, beacons, radio beacons and other navigational marks • The characteristics and range of lights • Coastlines, coast and radar-responsive targets • Coastline contours, bottom topography, depths and nature of bottom • Tidal information given on a chart • Navigational aids • Reading nautical charts • Information on chart correction and maintain charts (notices to mariners) • Information of chart catalogue and Admiralty Sailing
Sextant (2 hours)	• Handling sextant • Use of sextant

Assessment
Includes both

a)	practical assessment of skills through continuous assessment	70%
b)	final examination	30%

Practical activities

a) Identify different atolls on the map of Maldives
b) Identify main channels and islands on the map of Maldives
c) Use nautical charts to plot a navigation path in Maldives waters
d) Identify navigational hazards in the Maldives
e) Identify navigational aids in the Maldives

Subject name: Understand ocean productivity and oceanographic factors that affect fisheries

Credits: 15 Independent learning hours: 150hours Contact hours: 50 hours

Mode of delivery: Lecture, group work, field work and workshops

Minimum qualification of the instructor/lecturer: Bachelors degree in the relevant field

Pre-requisites: Nil

Co-requisites: Nil

Expected learning outcomes:

The study of this unit will enable Participants to:

1. Identify feature of the marine environment
2. Understand the structures of the earth and how these structures are formed
3. Understand the importance of coral reefs and its role in formation of atolls
4. Know and understand the monsoons in the Indian Ocean region
5. Understand the physical and chemical properties of the world oceans and discuss how it affects the organisms
6. Identify and distinguish organisms in the marine environment
7. Understand adaptations of organisms and know how they are inter-related
8. Explain the productivity of the marine environment
9. Collect plankton and observe planktons under the microscope
10. Find the salinity and density of seawater by evaporation
11. Find the behaviour of hot and cold water when they are mixed
12. Find the behaviour of fresh and salt water when they are mixed
13. Observe effect of wind on thermocline with the help of improvised equipment
14. Observe the penetration of light at sea

Curricular content:

Main topics	Content details
Physical properties of seawater (6 hours)	• Hydrological cycles • Effects of temperature and salinity in seawater • Light penetration • Density variation in seawater
Chemical properties of seawater (6 hours)	• Dissolved constituents and gases in seawater (macro and micro nutrients) • Seawater and freshwater comparison
Physical oceanography (12 hours)	• Tides • Ocean currents – upwelling and downwelling • Waves
Biological oceanography	• Plankton, algae and plants

(18 hours)	- Pelagic and benthic realms - Habitats – coral reef, lagoon, open ocean, seagrass and mangrove - Photosynethesis, and primary production - Factors affecting primary production - Primary productivity and marine organism
Inter-relationships (12 hours)	- Symbiotic relationships - Food chains and food webs - Prey predator relationships - Specific features of organisms in different habitats - Shoaling of fish

Assessment
Includes

a) practical assessment of skills through continuous assessment	30%
b) continuous assessment	40%
c) final examination	30%

Practical activities

a) Compare density of fresh and salt water
b) Compare density of hot and cold water by mixing
c) Measuring of seawater at different depths
d) Measure light penetration
e) Measure current speed and direction
f) Study variation in tide
g) Study the behaviour of thermocline formation using improvised equipment
h) Measure the salinity of seawater by evaporation and using hydrometer
i) Collect plankton using a plankton net
j) Observing plankton under the microscope
k) Snorkeling on the reef to observe different zones on the reef and distribution of organisms
l) Study the zonation and distribution in mangroves
m) Study the organisms and features of seagrass habitat
n) Study the lagoon and beach organisms
o) Using water plants observe the production of oxygen

Subject name: Understand tuna fisheries in the Indian Ocean

Credits: 15 Independent learning hours: 150 hours Contact hours: 50 hours

Mode of delivery: Lecture, group work, field work and workshops

Minimum qualification of the instructor/lecturer: Bachelors degree in the relevant field

Pre-requisites: Nil

Co-requisites: Nil

Learning outcomes:

The study of this unit will enable Participants to:

1. Identify different species of tuna
2. Describe the external and internal features of tuna
3. Dissect the different tuna species and observe the internal organs
4. Measure the fecundity of yellowfin tuna or skipjack tuna
5. Describe lifecycle and behavior of tuna
6. Explain tuna fishing methods in the Indian Ocean
7. Identify common livebait species used in the tuna fishery
8. Explain livebait fishing related to tuna fishery
9. Tie essential knot on fishing line and ropes

Curricular content:

Main topics	Content details
Tuna biology (12 hours)	• Tuna species • External features of tuna • Internal features of tuna • Lifecycle of tuna
Tuna behavior (6 hours)	• Feeding • Shoaling • Affects of temperature, light and nutrients
Commercial importance of tuna (6 hours)	• Commercially important species of tuna • Main tuna markets • Tuna products
Indian Ocean tuna fishery (6 hours)	• Species • Fish stocks • Main fishing grounds • Indian ocean tuna fishery status
Maldives tuna fishery status (10 hours)	• Species • Fish stock • Main fishing grounds • Developments/Changes in the Maldives tuna fishery

	• Trends in the Maldives tuna catch
Tuna fishing gear and methods (18 hours)	• Pole-and-line • Handline • Gill net • Longline • Purse seine • Fish Aggregating Devices (FADs)
Livebait fishery associated with tuna fishery (6 hours)	• Common livebait species • Status of the livebait fishery • Livebait fishing methods • Ecological impacts • Interaction with Endangered, Threatened and Protected species

Assessment
Includes

a)	practical assessment of skills through continuous assessment	30%
b)	continuous assessment	40%
c)	final examination	30%

Practical activities

a) Visiting the fish market to observe different species of fish
b) Observing external features of pelagic and reef fish
c) Dissecting and observing pelagic and reef fish
d) Streamlining of fish studied using different shapes
e) Visit a shop to see different tuna products
f) Identify main fishing grounds on a map of Maldives
g) Identify fishing areas in the Indian Ocean
h) Tie common knots for joining fishing lines and ropes
i) View video on different fishing methods

Subject name: Develop skills necessary for tuna fishery management

Credits: 15 Independent learning hours: 150 hours Contact hours: 50 hours

Mode of delivery: Lecture, group work, field work and workshops

Minimum qualification of the instructor/lecturer: Bachelors degree in the relevant field

Pre-requisites: Nil

Co-requisites: Nil

Learning outcomes:

The study of this unit will enable Participants to:

1. Describe major tuna fisheries of the world
2. Understand and demonstrate fisheries quota settings related to management
3. State the importance of obtaining data for fishery management
4. Apply international standards and codes of conduct to fisheries management
5. Relate the importance of fishing to food security and sustainable livelihoods
6. Discuss various management regimes implemented across the world to manage fish stocks
7. Debate on the fisheries management strategies of the Maldives
8. Explain fisheries law in the Maldives
9. Explain the challenges in fisheries management
10. Debate on the global issues related to fishery management
11. Develop a management plan for managing one of the fisheries in the Maldives
12. Outline the benefits of marine reserves for fisheries
13. Explain the impacts of IUU fishing
14. Outline the role of RFMO in fishery management
15. Discuss the importance in participating IOTC for managing migratory species such as tuna
16. Compare the management strategies implemented in the Maldives
17. Brainstorm on the challenges facing authorities in fishery management in the Maldives
18. Describe the role of fishers in contributing to the management of resources
19. Outline the benefits of proper management of fishery resources
20. Describe the importance of fisheries research for management

Curricular content:

Main topics	Content details
World fishery today (8 hours)	• History fishing in the world • Major tuna fisheries of the world • Compare consumption levels around the world / Sites of harvest and sites of consumption • Nature and context of major challenges facing international fisheries today • Ecological limits and environmental threats to fisheries around the world
Socio-political issues in fisheries (8 hours)	• Small-scale and artisanal fisheries • The relative importance of fish to countries and cultures around the world • Globalisation • Multinational and industrial fishing • Conflicts - Access to fish stocks in international waters / Commercial vs. recreational fishers / Non-extractive uses of fishing waters
Maldives and tuna (6 hours)	• Oral history – fish/fishing in traditional myths and story-telling • Religious perspectives on fish and fisheries management • The Maldives special relationship with tuna • The importance of fish and fishing in Maldivian economy and sustaining livelihoods • Traditional fishing practice • Health and status of fisheries in the Maldives • Issues and challenges for fisheries management in the Maldives
Fishery management (12 hours)	• "Tragedy of the commons" and its solutions • Managing fishing communities • Institutions and capacity building • Ecosystem complexity • Resilience • Implications for control • Overview of tools used for fisheries management • The precautionary approach • Marine reserves
International and national framework for fisheries management (10 hours)	• Laws and regulations: UNCLOS, UN Agreement on Straddling and Highly Migratory fish stocks, FAO Code of Conduct for Responsible fisheries and IUU fishing • Role of RFMOs in tuna fisheries management

	- Indian Ocean Tuna Commission - Maldives fisheries law / regulations
Role of research in fishery management (10 hours)	- Tuna tagging – migration and growth - Length frequency sampling - Otolith study – growth - Genetic study – stock - Acoustic tagging around FADs – resident time and movement between FADs - Gut content analysis – food - Catch statistics - Fecundity study – maturity status of fish

Assessment

Includes

a)	practical assessment of skills through continuous assessment	20%
b)	continuous assessment	50%
c)	final examination	30%

Practical activity

a) Visit to MRC and FMD of MOFA to learn about fishery research and management
b) Visit coast guard to understand the role of coast guard in protecting the welfare of the fishermen and fishery resources
c) Demonstrate otolith removal from tuna
d) Estimate fecundity of tuna
e) Study the length and weight relationship
f) Analyse the gut content of tuna
g) Role play on stakeholder participation in managing the fishery
h) Use national catch statistics to understand the variation in catch

Subject name: Handle fresh fish

Credits: 10 Independent learning hours: 80 hours Contact hours: 40 hours

Mode of delivery: Lecture, group work, field work and workshops

Minimum qualification of the instructor/lecturer: Bachelors degree in the relevant field

Pre-requisites: Nil

Co-requisites: Nil

Learning outcomes:

The study of this unit will enable Participants to:

1. Distinguish between fresh and spoilt fish
2. Describe two main food spoilage agents and their characteristics
3. Describe the four main types of spoilage which affect fish after they die
4. Describe food related diseases with reference to food poisoning
5. Demonstrate good fish handling practices
6. Outline the criteria for good handling practice to reduce spoilage
7. Handle fish appropriately to reduce spoilage
8. Prepare an ice slurry for reducing fish spoilage
9. Calculate the amount of ice required to chill fish

Curricular content:

Main topics	Content details
Spoilage (8 hours)	• Agents • Types • Histamine poisoning • Food borne diseases
Quality assessment (6 hours)	• Sensory • Organoleptic • Chemical • Physical • microbiological
Handling catch (8 hours)	• Dead fish handling – pole-and-line catch • Large yellowfin handling – cleaning, gutting and icing • Landing of catch at ports • Grades of tuna – *Sashimi*
Hygiene (6 hours)	• Personal cleanliness • Health • Vessel hygiene – Health certification of vessel • Link with exporter
Use of ice in chilling	• Effectiveness

(12 hours)	• Making an ice slurry • Proportion of ice used to fish weight • Use of chilled seawater

Assessment
Includes

a)	practical assessment of skills through continuous assessment	50%
b)	continuous assessment	30%
c)	final examination	20%

Practical activity

a) Compare fresh and spoilt fish
b) Observe factors affecting spoilage
c) Use different methods to reduce spoilage
d) Observe handling of fish on a pole-and-line and handline fishing vessel
e) Practice coring and bleeding of tuna
f) Make an ice slurry
g) Compare effect of chilled seawater and chilled fresh water on fish
h) Compare the effect of ice made from seawater and freshwater on fish
i) Visit a tuna processing plant and observe the hygiene and handling condition of fish

Subject name: Marine engines and electronics

Credits: 6 Independent learning hours: 48 hours Contact hours: 24 hours
Mode of delivery: Lecture, group work, field work and workshops
Minimum qualification of the instructor/lecturer: Bachelors degree in the relevant field
Pre-requisites: Nil
Co-requisites: Nil

Learning outcomes:

The study of this unit will enable Participants to:

1. Identify different parts of the engine
2. Describe the working principles of 2 and 4 stroke engines
3. Identify faulty engine parts
4. Carryout simple repair on marine engines, generator and electronic equipment on board the fishing vessel
5. Change filters, lubricating oil and coolant
6. Conduct regular maintenance checks
7. Service battery
8. Take proper precautions in handling electrical equipment
9. Maintain a log of running for engine and generator

Curricular content:

Main topics	Content details
Principles of engine (6 hours)	• 2 stroke and 4 stoke marine engine • Generator • Petrol and diesel engines
Basic trouble shoot in marine engines (12 hours)	• Identification • Using manuals • Cooling systems – working principles • Replacing filters • Routine checks • Log of running • Importance of planned maintenance
Electricity concepts (6 hours)	• Types of electricity • Fuse • Dangers of electricity • Repair simple connections • Maintenance of battery

Assessment
Includes

a)	practical assessment of skills through continuous assessment	50%
b)	continuous assessment (practical)	30%
c)	final examination	20%

Practical activity

a) Identify different parts of a petrol and diesel engine
b) Practice simple repair and service diesel engine, pump and generator
c) Replace essential fluids used to ensure proper running of engines
d) Repair/replace some basic parts of engines/pumps/generators
e) Develop a log for recording the operation of engine and generator
f) Carryout basic wiring – repair and replace basic components of an electric circuit
g) Service battery

بسم الله الرحمن الرحيم

މޯލްޑިވްސް ކޮލިފިކޭޝަންސް އޮތޯރިޓީ
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މާލެ، ދިވެހިރާއްޖެ

ހުނަރުވެރި ދަރިވަރުން - ފެއްދުމުގެ ތަރައްޤީ

ނަންބަރު: 218/MIS/2014/1884

މޯލްޑިވްސް ވިޝަންސް ކޮމިއުނިޓީ އެންޑް ޓްރޭނިންގ ސެންޓަރގެ ޗެއަރމަން އަލްފާޟިލް މައިޒާން އަލީ

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ވުދުން ސަލާމަށްފަހު ދަންނަވަމެވެ.

ތިޔަ ސެންޓަރުން ހިންގުމުގެ ހުއްދައަށް އެދިވަޑައިގެން ހުށަހަޅުއްވާފައިވާ ތިރީގައިވާ ކޯސް ތިރީގައި ބަޔާންކޮށްފައިވާ ފެންވަރުގައި ހިންގުމުގެ ހުއްދަ ދިނީމެވެ.

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އިޙްތިރާމް ޤަބޫލުކުރައްވާކަން އެދެމެވެ.

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