

Faculty of Fisheries and Marine Sciences, IPB University

Subject title:	Advanced Fish Nutrition	Semester	1
		Credit	3
Keywords	Fish nutrition, nutritional, aquaculture		
Professor:	Professor M. Agus SUPRAYUDI Associate Professor Dedi JUSADI Associate Professor Mia SETIAWATI Associate Professor Julie EKASARI Assistant Professor Ichsan A. FAUZI		
Contact office	Department Aquaculture building, 3 rd floor, IPB University		
Contact hours	After class		
Target	Upon the completion of this course, the student will be able to explain fundamental aspects of fish nutrition, including various approaches to fulfil the nutrient requirement of the cultured organisms, by taking into account the nutrient balance, the interaction between nutrients, the animal's developmental stages and species, as well as the culture environment.		
Description	The course covers the fundamental aspects of fish nutrition, including digestion processes, bioenergetics, macro and micro nutrients requirement of aquaculture organisms as well as the theory and practice in nutritional assessment in feed and feeding in aquaculture.		
Class schedule:	<ol style="list-style-type: none">1. Definition and scope of fish nutrition2. Digestion processes:<ul style="list-style-type: none">• morphology of digestive tract of aquatic organisms• enzymatic processes in digestion processes3. Feed raw materials:<ul style="list-style-type: none">• plant-based raw materials• animal-based raw materials• feed additives4. Protein:<ul style="list-style-type: none">• its functions in aquaculture organisms,• its requirement and relation to non-protein energy,• protein utilization efficiency,• utilization of protein in growth and reproduction5. Carbohydrate:<ul style="list-style-type: none">• Its functions in aquaculture organisms• utilization of carbohydrate in different species• its requirement and role in growth and reproduction6. Lipids:<ul style="list-style-type: none">• its functions in aquaculture organisms• essential fatty acids synthesis mechanisms in aquaculture organisms• lipid requirement• its role in growth and reproduction, and larvae development7. Minerals:<ul style="list-style-type: none">• its functions in aquaculture organisms• its requirement and interactions with other nutrients• its role in growth and reproduction8. Vitamins:<ul style="list-style-type: none">• its functions in aquaculture organisms		

- its requirement and interactions with other nutrients
 - its role in growth and reproduction
9. Nutrition and health

Important items:	-
Self-studies and other advices	Homework needs searching and summarizing a journal paper after a class and preparing reports for the next class.
Textbooks	Prepared by the professor each time
Requisites to take subject:	Unconditional and no prerequisite
Assessment method:	Examination and continuously assessment on the report and participation into Class and discussion.
Evaluation criteria	A \geq 80, 75 \leq AB < 80 70 \leq B < 75, 65 \leq BC < 70 60 \leq C < 65, 55 \leq D \leq 59
Relevant matters	Explanations in English

Faculty of Fisheries and Marine Sciences, IPB University

Subject title	Fisheries Management With An Ecosystem Approach	Semester Credit	2 3
Key word	fisheries resources, ecology, economy and social system		
Professor	Associate Professor Yonvitner Professor Mennofatria BROER Associate Professor Luky ADRIANTO Associate Professor M. Mukhlis KAMAL		
Contact office	Department of Aquatic Resources Management building, IPB University		
Contact hours	After class		
Target	Integration fisheries resources, ecology, economy and social system on fisheries management system as a complex system for better management.		
Description	Fisheries management regime. Fisheries management paradigm; global, regional and national policies in the field of coastal and ocean management; effectiveness of ICM.		
Class schedule:	Introduction to ecosystem approach for fisheries management (EAFM) Fisheries Conectivity on Fisheries Management Ecosystem Context on EAFM Introduction of Fish Stock Assessment Ecological context on EAFM CBD In Term of Conservation and Biological Use Fisheries Resources on Approach EAFM Production and Growth of Fisheries Resources Fishing Technology Approach on EAFM Integration Multi System on EAFM Population and Growth Rate EAFM Practice and Implementation in Indonesia Fisheries Context Social Economy Approach on EAFM Legislation and Governance Approach on EAFM		
Important items:	-		
Self-studies and other advices	Homework needs searching and summarizing a journal paper after a class and preparing reports for the next class.		
Textbooks	Prepared by the professor each time		
Requisites to take subject:	Unconditional and no prerequisite		
Assessment method:	Examination and continuously assessment on the report and participation into Class and discussion.		
Evaluation criteria	A ≥ 80, 75 ≤ AB < 80 70 ≤ B < 75, 65 ≤ BC < 70 60 ≤ C < 65, 55 ≤ D ≤ 59		
Relevant matters	Explanations in English		

Faculty of Fisheries and Marine Sciences, IPB University

Subject title: Fish Stock Assessment Semester 2
Credit 3

Key word Fish management, fish stock, Stock estimation techniques

Professor: Professor Mennofatria BOER
Associate Professor Achmad FAHRUDIN
Associate Professor Rahmat KURNIA

Contact office Department of Aquatic Resources Management building, IPB University

Contact hours After class

Target Fisheries management rely on models, in particular surplus production, yield per recruit, biomass per recruit, dynamic optimization, that predict a population's responses to exploitation. Fish Stock Assessment introduces approaches that are commonly used to assess and evaluate the dynamics and status of a population in the context of Indonesian Economic Exclusive Zone. This course provides an overview of the terminology, data requirements especially length-based frequency, underlying rationale, assumptions, limitations and uncertainty associated with stock assessments.

Description Stock estimation techniques both analytically/structurally, globally and in combination (holistic). The discussion is carried out through simple models and more complex models such as surplus yield models and catch forecasting as well as dynamic pool models that are needed in the management of sustainable fisheries resources. Verification and validation of the use of models to the effects of fishing on stocks, and evaluation and simulation for management fisheries resources.

Class schedule:

Topic
Introduction to fish stock assessment
Fish length frequency (1)
Fish length frequency (2)
Fish length frequency (3)
Surplus Production Model (1)
Surplus Production Model (2)
Indonesia's Economic Exclusive Zone
Field Per Recruit and Biomass Per Recruit Models
Journal Presentation
Virtual Population Analysis
Journal Presentation
Surplus Production Model and Bioeconomy
Dynamic Optimal Model
Dynamic Optimal Multi Species Model

Important items:

Self-studies and other advices	Homework needs searching and summarizing a journal paper after a class and preparing reports for the next class.
Textbooks	Prepared by the professor each time
Requisites to take subject:	Unconditional and no prerequisite
Assessment method:	Examination and continuously assessment on the report and participation into Class and discussion.
Evaluation criteria	$A \geq 80$, $75 \leq AB < 80$ $70 \leq B < 75$, $65 \leq BC < 70$ $60 \leq C < 65$, $55 \leq D \leq 59$
Relevant matters	Explanations in English

Self-studies and other advices	Homework needs searching and summarizing a journal paper after a class and preparing reports for the next class.
Textbooks	Prepared by the professor each time
Assessment method	: Mid and Final exam, report assignment, field trip presentation, business development idea/proposal
Evaluation criteria	A \geq 80, 75 \leq AB < 80 70 \leq B < 75, 65 \leq BC < 70 60 \leq C < 65, 55 \leq D \leq 59
Relevant matters	Explanations in English

Faculty of Fisheries and Marine Sciences, IPB University

Subject title	Advanced Fishing Method Development	Semester Credit	2 3
Key word	fish behavior, Fishing technology		
Professor	Associate Professor M. Fedi A. SONDITA Associate Professor Mochammad RIYANTO Professor Ari PURBAYANTO Professor Mulyono S BASKORO Associate Professor Wazir MAWARDI		
Contact office	Department of Fisheries Resources Utilization building, IPB University		
Contact hours	After class		
Target	<p>After attending this course, the students should have the following capabilities in:</p> <ol style="list-style-type: none"> 1. correctly identifying opportunity to develop advanced fishing methods from capture process point of view. 2. correctly identifying indicators of stimulants 3. correctly applying basic methods to monitor or measure indicators of stimulants 4. correctly identifying indicators of fish behavior 5. correctly applying basic methods to monitor or measure indicators of observable fish behavior 6. correctly applying basic methods to monitor or measure indicators of physiological aspects of fish behavior 7. comprehensively define features of advanced fishing methods which respect the concept of sustainable-responsible fisheries management 8. implementing research project on fish behavior to improve existing fishing methods. 		
Description:	<p>This course is designed to postgraduate students majoring in fishing technology or those who are interested in applying physiology-behavioral science to improve fishing performance that promote sustainability of fish resources. Learning approaches are class room, mini projects, writing report and seminar. The students will be exposed to problems that required technical solution that manipulate and utilize behavior of target species, bycatch or unwanted species. Performance of improved fishing is evaluated in terms of success in attracting eligible target species or releasing or repulsing unwanted catch, promoting survival after escapement or release. This course contributes to sustainability science, conservation science of aquatic animals. The students will be introduced to some methods to identify critical indicators of modern measures of fishing performance. These indicators are technical aspects of fishing operation, response of fish to fishing gear operation (observed behavioral and physiological response. Such critical factors are determined from capture mechanism, measurement of fish behavior indicators, and manipulation of fish behavior. The identified critical factors are then used as bases for improving fishing method and technological package. In this course, the students are providing an opportunity to practice experiments in manipulating fish behavior, observe and measure the behavior parameters and writing up a report and its presentation.</p>		

Class schedule:

No	Topic
1	Opportunities to improve fishing methods
2	Indicators of fish behavior in controlled environment

3	Indicators of fish behavior in uncontrolled environment
4	Response of fish to visual stimulant (natural and artificial light)
5	Response of fish to static solid and mobile objects (traps, hooks and active fishing gear)
6	Response of fish to audio stimulant
7	Response of fish to chemical stimulants (baits)
8	Response of fish to ambient temperature
9	Response of fish to water current (tidal trap and setnet)
10	Response of fish to the presence of their predators, vice versa (escape behavior/hunting behavior)
11	Use of iridology in assessing fish behavior
12 and 13	Stress experienced by fish after capture process
14	Future fishing methods

Important items:

Self-studies and other advices

Homework needs searching and summarizing a journal paper after a class and preparing reports for the next class.

Textbooks

Prepared by the professor each time

Assessment method:

No	Criteria	Range	Percentage (%)	Note
1	Mid exam	0 – 100	28	
2	Final exam	0 – 100	28	
3	Practical assignment	0 – 100	40	
4	Presence	0 – 100	4	Including practical class

Evaluation criteria

$A \geq 80$, $75 \leq AB < 80$
 $70 \leq B < 75$, $65 \leq BC < 70$
 $60 \leq C < 65$, $55 \leq D \leq 59$

Relevant matters

Explanations in English

Faculty of Fisheries and Marine Sciences, IPB University

Subject title	Fisheries Acoustics	Semester	2
		Credit	3

Key word fisheries acoustic.

Professor Professor Indra JAYA
 Associate Professor Totok HESTIRIANOTO
 Associate Professor Sri PUJIYATI
 Professor Henry MANIK

Contact office Department of Marine Science building, IPB University

Contact hours After class

Target To give students the understanding of theory and application of fisheries acoustic.

1. General Learning Outcome

Upon successful completion of this course the student will be able to explain the history acoustic, operation of underwater acoustic equipment, Design Survey and application of fisheries acoustic

2. Specific Learning Outcome

Upon successful completion of this course the student will be able to:

- a. Explain the history, Acoustic terminology and symbols
- b. Operate the underwater acoustic instrument
- c. Know properties of underwater target
- d. Create a measurement design in a controlled and field condition

9. Apply Fisheries acoustic for TS,SV, stock assessment

Description This course introduces knowledge of history, acoustic instrument and application of Fisheries acoustic.

Class schedule:

Week	Sub-Topics
1	Introduction - A brief history - Acoustic terminology and symbols
2	Acoustic instrument - Scientific Echo sounder - Installation and calibration of acoustic systems
3	Acoustics Target - Large and small Targets - Standard targets - Target shape and orientation
4	Target strength (TS) of Fish
5-6	Experimental measurement of Target strength (TS) - Immobile fish - Live fish in cage - Wild fish
7	Abundant estimation - Volume Back scattering strength (SV) - Area Back scattering Strength (SA)

8	Design Survey and Data analysis
9	Plankton and Micronekton Acoustics
10-11	Detection of Pelagic fish
12	Detection of demersal fish and bottom
13-14	Numerical model of Fisheries acoustic

Important items:

Self-studies and other advices Homework needs searching and summarizing a journal paper after a class and preparing reports for the next class.

Textbooks Prepared by the professor each time

Requisites to take subject: Unconditional and no prerequisite

Assessment

method:

No	Criteria	Range	Percentage (%)	Note
1	Mid exam	0 – 100	30	
2	Final exam	0 – 100	30	
3	Practical assignment	0 – 100	30	
5	Presence	0 – 100	10	Including practical class

Evaluation criteria
 $A \geq 80$, $75 \leq AB < 80$
 $70 \leq B < 75$, $65 \leq BC < 70$
 $60 \leq C < 65$, $55 \leq D \leq 59$

Relevant matters
 Explanations in English