هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

اعتماد
NCAAA
T15

Course Specifications
(Postgraduate Degree)

Course Title:	**Aquatic Biodiversity**
Course Code:	**BIOD 506**
Program:	**M. Sc. Biodiversity**
Department:	**Biology**
College:	**Science**
Institution:	**University of Tabuk**

Table of Contents

A. Course Identification

1. Credit hours: 3 Credit Hours (2 Theoretical + 1 Practical)
2. Course type ☒ Required ☐ Elective
3. Level/year at which this course is offered: Level 2/First year
4. Pre-requisites for this course (if any)**: BIOD 501**
5. Co-requisites for this course (if any)**: None**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	4	100
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
1	**Lecture**	26
2	**Laboratory/Studio**	26
3	**Seminars**	
4	**Others** (specify)	
Total		52

B. Course Objectives and Learning Outcomes

1. **Course Description:**

- This course describes aquatic ecosystems (i.e. Freshwater, marine, and wetland ecosystems), and their biodiversity, systematics, and productivity. It also provides fundamental information on aquatic ecosystems, the impact of environmental factors, and human activities on the biodiversity of aquatic ecosystems. Also, the course describes the methods of establishment and conservation of aquatic and wetland resources and protected areas, marine fisheries, and case studies on different topics of aquatic biodiversity.

2. Course Main Objective

By the end of this course, the students should be able to:

- Identify different types of aquatic ecosystems.
- Illustrate the complex nature of environmental factors that affect and control aquatic biodiversity.
- Describe the aquatic biodiversity and its measures.
- Record the impact and rapid spread of non-indigenous aquatic species on aquatic ecosystems.
- Demonstrate methods of introduction and spread of non-indigenous in aquatic ecosystems, and the current control measures.
- List threats to aquatic biodiversity and the mechanisms that can be used to determine and manage biodiversity loss.
- Describe the major fisheries management programs related to aquatic biodiversity loss

and conservation.

3. Course Learning Outcomes

	Course Learning Outcomes (CLOs)	Aligned PLOs*
1	**Knowledge and Understanding:**	
1.1	Describe key-environmental variables (eg. light and temperature regimes, salinity, and nutrients) affecting marine biodiversity.	K1
1.2	Outline the differences in species biodiversity in aquatic ecosystems.	K1
1.3	Recall characteristic features and adaptation of marine plankton, nektons, and benthos.	K2
1...		
2	**Skills:**	
2.1	Evaluate the impact of environmental factors on biological diversity in aquatic ecosystems.	S1
2.2	Estimate biological aspects of aquatic ecosystems and the physical processes that regulate biodiversity.	S4
2.3	Analyze plankton and larvae, fish and benthos using different techniques and equipment (vessel, nets, grab, corer, trawl, dredge, SCUBA	S4
2...		
3	**Values:**	
3.1	Examine physical factors (e.g. Temperature; Salinity, Oxygen, and Light) that influence biodiversity in aquatic ecosystems.	V2
3.2	Examine ecological interactions; interactions on the scale of individuals, population level, community-level, and structure, and interspecies interactions.	V2
3.3	Illustrate the impacts of current action strategies, such as aquatic protected areas.	V3
3...		

* Program Learning Outcomes

C. Course Content

No	List of Topics	Contact Hours
1	Introduction, and types of aquatic ecosystems	2
2	Spatial and Temporal pattern of aquatic Biodiversity	2
3	Environmental factors and Reproduction, Dispersal, and Migration of aquatic species	2
4	The productivity of aquatic ecosystems	2
5	Food Webs and microbial ecology in aquatic ecosystems	2
6	Marine ecosystem Seaweeds and Kelp Forests, and Seagrass Meadows	2
7	Marine ecosystem: Coral Reef, and Mangrove	2
8	Aquatic ecosystems: Vertebrates and Other Nektons	2
9	Aquaculture and biodiversity conservation	2
10	Anthropogenic impacts on aquatic biodiversity	2
11	Establishment of aquatic and wetland resources protected areas	2
12	Marine Fisheries and Biodiversity – Overfishing	2

13	Case studies on aquatic biodiversity	2
Total		26

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding:**		
1.1	Describe key-environmental variables (eg. light and temperature regimes, salinity, and nutrients) affecting marine biodiversity.	- Lectures. - Group discussions. - Brainstorming. - The use of educational techniques (Videos). - Student's seminars. - Individual presentation. - Lab. demonstrations. - Field studies.	- Oral discussions. - Long and short essays. - Exams (Mid and Final) - Homework. - Quizzes. - Demonstrations. - Lab. reports. - Field reports.
1.2	Outline the differences in species biodiversity in aquatic ecosystems.		
1.3	Recall characteristic features and adaptation of marine plankton, nektons, and benthos.		
1…			
2.0	**Skills:**		
2.1	Evaluate the impact of environmental factors on biological diversity in aquatic ecosystems.	- Lectures. - Group discussions. - Brainstorming. - Simulation. - Research paper-based learning. - The use of interactive video. - Lab. demonstrations. - Individual presentation. - Field studies.	- Peer assessment. - Self-evaluation. - Oral discussion. - Exams (Mid and Final) - Quizzes. - Individual and group presentations. - Lab. reports. - Field reports.
2.2	Estimate biological aspects of aquatic ecosystems and the physical processes that regulate biodiversity.		
2.3	Analyze plankton and larvae, fish and benthos using different techniques and equipment (vessel, nets, grab, corer, trawl, dredge, SCUBA		
2…			
3.0	**Values:**		
3.1	Examine physical factors (e.g. Temperature; Salinity, Oxygen, and Light) that influence biodiversity in aquatic ecosystems.	- Research activities. - Oral presentations. - An internet search, assignments, and essays. - Group discussion. - Case studies. - Individual, and group presentations.	- Student's essays and assignments. - Group reports. - Group presentations. - Discussion in lectures. - Student's written participation. - Analytical reports. - Lab. reports. - Case studies.
3.2	Examine ecological interactions; interactions on the scale of individuals, population level, community-level, and structure, and interspecies interactions.		
3.3	Illustrate the impacts of current action strategies, such as aquatic protected areas.		
3…			

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
			- Posters.

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Activities and Short Quizzes	Distributed over 8 weeks	10
2	Pre-Final Practical Exam	8	10
3	Pre-Final Theoretical Exam	8	25
5	Final Practical Exam	15	15
6	Final Theory Exam	16	40
7			
8			
9			
	Total		100

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice:

- Eight office hours per week per faculty member.
- Academic advising sessions 1hr/ week per faculty member.

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	- Levinton, J. S. (2017). Marine Biology: Function, Biodiversity, Ecology (5th edition). Oxford University Press. ISBN: 9780190625276. - Kaiser, M. J., Attrill, M. J., Jennings, S. and Thomas, D. N. (2020). Marine Ecology: Processes, Systems, and Impacts (3rd edition). Oxford University Press. ISBN-13: 978-0198717850. - Mamta, R., Sumit, D. and Chandrakasan, S. (2015). Aquatic Ecosystem: Biodiversity, Ecology and Conservation. Springer. ISBN: 978-81-322-2178-4.
Essential Reference Materials	- *Journal of Biodiversity*. - *Journal of Wildlife Management*.
Electronic Materials	- Saudi Digital Library. - UNESDOC Digital Library. - www.sciencedirect.com
Other Learning Materials	- Multimedia that is associated with the textbook and the relevant websites.

2. Educational and Research Facilities and Equipment Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	- A sufficient number of classrooms, well equipped practical laboratories are available to accommodate 30-40 students.
Technology Resources (AV, data show, Smart Board, software, etc.)	- Data show projectors and wireless internet connection available for students and faculties. - Smart blackboard. - Computer Portable PowerPoint presentations.
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	- Lecture slides. - Reference Book. - A Note Book for writing notes. - Well-equipped biology laboratory.

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
- Effectiveness of teaching and assessment.	- Students.	• Indirect - Questionnaires.
- Quality of learning resources.	- Program committee. - Staff members. - Students.	• Direct - Questionnaires. - Reports. - Meetings.
- The extent of achieving the course learning outcomes.	- Program leaders. - Peer Reviewer.	• Direct & Indirect - Questionnaires. - Reports. - Meetings.

Evaluation Areas/Issues (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	Biology Department Members who constructed the program
Reference No.	Committee members – The academic year 1441/1442
Date	