



Course Specification

(Postgraduate Programs)

Course Title: **Aquatic Biodiversity**

Course Code: **BIOD506**

Program: **Master's in Biodiversity**

Department: **Department of Biology**

College: **Faculty of Science**

Institution: **University of Tabuk**

Version: **2**

Last Revision Date: **18/11/1444 H**

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A. General information about the course:

1. Course Identification:

1. Credit hours: 3 credit hours (2 Theoretical + 1 Practical)

2. Course type

A. ☐ University ☐ College ☒ Department ☐ Track

B. ☒ Required ☐ Elective

3. Level/year at which this course is offered: (Level 2/ First year)

4. Course General 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.

5. Pre-requirements for this course (if any):

- Principles of Biodiversity (BIOD501).

6. Pre-requirements for this course (if any):

- None.

7. Course Main Objective(s):

- 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.

2. Teaching Mode: (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	60	100%
2	E-learning		
3	Hybrid <ul style="list-style-type: none"> Traditional classroom E-learning 		
4	Distance learning		

3. Contact Hours: (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	30
2.	Laboratory/Studio	20
3.	Field	10
4.	Tutorial	
5.	Others (specify).....	
Total		60

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods:

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Explain the key environmental variables (e.g., light, temperature, salinity, nutrients) affecting marine biodiversity.	K1	<ul style="list-style-type: none"> Lectures. Seminars. Class discussions. Problem-solving classes. Self-learning. 	<ul style="list-style-type: none"> Written exams (Midterm and Final exams). Quizzes. Class discussions.
1.2	Identify the key processes and adaptations of marine plankton, nekton, and benthos, and their roles in marine ecosystems.	K2	<ul style="list-style-type: none"> Lectures. Seminars. Class discussions. Problem-solving classes. 	<ul style="list-style-type: none"> Written exams (Midterm and Final exams). Quizzes. Class discussions.



Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
...			- Self-learning.	
2.0	Skills			
2.1	Analyze the use of various techniques and equipment for studying plankton, larvae, fish, and benthos in aquatic ecosystems.	S2	<ul style="list-style-type: none"> - Lectures. - Practical sessions. - Field works. - Seminars. - Class discussions. - Problem-solving classes. - Self-learning. - Individual and group presentations. - Assignments. 	<ul style="list-style-type: none"> - Written exams (Midterm and Final exams). - Quizzes. - Laboratory reports. - Class discussions. - Individual and group presentations. - Assignments.
2.2	Evaluate the impact of environmental factors on biological diversity in aquatic ecosystems.	S3	<ul style="list-style-type: none"> - Lectures. - Practical sessions. - Field works. - Seminars. - Class discussions. - Problem-solving classes. - Self-learning. - Individual and group presentations. - Assignments. 	<ul style="list-style-type: none"> - Written exams (Midterm and Final exams). - Quizzes. - Laboratory reports. - Field reports. - Class discussions. - Individual and group presentations. - Assignments.
2.3	Communicate key information on threats to biodiversity including habitat loss, climate change, and pollution to diverse audiences through written reports and oral presentations.	S5	<ul style="list-style-type: none"> - Lectures. - Practical sessions. - Field works. - Seminars. - Class discussions. - Problem-solving classes. - Self-learning. 	<ul style="list-style-type: none"> - Written exams (Midterm and Final exams). - Quizzes. - Laboratory reports. - Field reports. - Class discussions. - Individual and





Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
			<ul style="list-style-type: none"> - Individual and group presentations. - Assignments. 	<ul style="list-style-type: none"> - group presentations. - Assignments.
....				
3.0	Values, autonomy, and responsibility			
3.1	Demonstrate an understanding of the ethical issues and impacts of human activities on aquatic biodiversity and ecosystems.	V1	<ul style="list-style-type: none"> - Class discussions. - Field work. - Practical sessions. - Individual and group presentations. - Assignments. 	<ul style="list-style-type: none"> - Class discussions. - Laboratory reports. - Filed reports. - Individual and group presentations. - Assignments.

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.	Aquatic Pollution on Biodiversity & Case studies on aquatic biodiversity.	2
14.	Climate Change on Aquatic Biodiversity & Case studies on aquatic biodiversity.	2
15.	Aquatic Biodiversity Monitoring, Assessment, Conservation Management and Measures.	2
Total		30



D. Students Assessment Activities:

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quizzes, Class discussion, Assignments	Distributed over 14 weeks	10
2.	Individual or group presentation	Distributed over 14 weeks	10
3.	Laboratory Reports, Field Reports	Distributed over 14 weeks	10
4.	Midterm Exam	9	20
5.	Practical Exam	16	10
6.	Final Exam	18	40
Total			100

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.)

E. Learning Resources and Facilities:

1. References and Learning Resources:

Essential References	<ul style="list-style-type: none"> - 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.
Supportive References	<ul style="list-style-type: none"> - <i>Journal of Biodiversity.</i> - <i>Journal of Wildlife Management.</i>
Electronic Materials	<ul style="list-style-type: none"> - Saudi Digital Library. - UNSEDOC Digital Library. - www.sciencedirect.com.
Other Learning Materials	<ul style="list-style-type: none"> - None.

2. Educational and Research Facilities and Equipment Required:

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	<ul style="list-style-type: none"> - A sufficient number of classrooms and well- equipped laboratories are available to accommodate up to 25 students. - Library.



Items	Resources
Technology equipment (Projector, smart board, software)	<ul style="list-style-type: none"> - Data show projectors and a wireless internet connection are available for students and faculties. - Smart blackboard. - Computer Portable PowerPoint presentations.
Other equipment (Depending on the nature of the specialty)	<ul style="list-style-type: none"> - None.

F. Assessment of Course Quality:

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	<ul style="list-style-type: none"> - Students. 	<ul style="list-style-type: none"> - Direct & Indirect.
Effectiveness of students' assessment	<ul style="list-style-type: none"> - Course instructors & Course coordinator (Teachers). 	<ul style="list-style-type: none"> - Direct.
Quality of learning resources	<ul style="list-style-type: none"> - Students. 	<ul style="list-style-type: none"> - Indirect.
The extent to which CLOs have been achieved	<ul style="list-style-type: none"> - Course instructors. - Course coordinator. - Quality Committee. 	<ul style="list-style-type: none"> - Direct & Indirect.
Other	<ul style="list-style-type: none"> - None. 	<ul style="list-style-type: none"> - NA.

Assessor (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

G. Specification Approval Data:

COUNCIL /COMMITTEE	Department of Biology Council
REFERENCE NO.	Department Council NO (26)
DATE	26/11/1444 H

