Course Specification
(Bachelor)

Course Title:	*Phycology*
Course Code:	*BIO1311*
Program:	*Bachelor of Science in Biology*
Department:	*Department of Biology*
College:	*Faculty of Science*
Institution:	*University of Tabuk*
Version:	***Course Specification Version Number***
Last Revision Date:	*September 2023*

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours:					
3 Credit (2 theoretical + 1 practical) hours.					
2. Course type					
A.	☐University	☐ College	☒ Department	☐Track	☐Others
B.	☒ Required		☐Elective		
3. Level/year at which this course is offered: (6th Level / 3rd year)					
4. Course general Description:					
This course covers topics on the fundamentals of algal diversity, structure, physiology, ecology, and evolution. Lectures will focus on algal morphology and structure, their different forms, including, classification, photosynthesis, growth, and reproduction. Emphasis on the ecological role of algae in different aquatic ecosystems (e.g. open ocean, estuaries, coral reefs, rocky intertidal), their impacts (e.g. harmful algae blooms, food webs), and their applications (e.g. food, biofuel, biofertilizer). The laboratory sections will concentrate on identifying the local marine flora as well as recognizing common genera from around the world. The Laboratory portion will be field-intensive and field trip based and algal field survey techniques for sampling, collection and cultivation.					
5. Pre-requirements for this course (if any):					
General Microbiology (BIO1206). General Botany 2 (BIO1301).					
6. Co-requirements for this course (if any):					
None					
7. Course Main Objective(s):					
By the end of this course, the students should be able to: - To Identify and use the basic vocabulary of Phycology. - To describe the distribution and economic importance of algae. - To describe sampling, identifying diverse algal species from the Red Sea. - To identify the major algal groups based upon recognition characteristics and ecological importance. - To understand the role algae play in critical environmental issues, such as eutrophication, algal bloom, human health, and global climate change.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	2	50%
2	E-learning		
3	Hybrid • Traditional classroom • E-learning		
4	Distance learning		
5	**Others (Lab work)**	2	50%

3. Contact Hours (based on the academic semester)

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

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

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Describe the basic (morphology, structure, biochemistry e.g. major pigments, storage products, products of economic importance). and diversity of algae.	K1	-Lectures. -Class discussion. -Group discussion. -Case studies.	-Quizzes -Midterm examination. -Final examination. -Class discussion and participation.

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
				- Homework (Problem-solving).
1.2	Differentiate the major groups of algae by structure (e.g. unicellular or multicellular, number and appearance of flagella, chloroplast structure and number of chloroplast membranes).	K2	-Lectures. -Class discussion. -Group discussion. -Homework assignments. -Case studies.	-Quizzes -Midterm examination. -Final examination. -Class discussion and participation. -Homework assignments.
2.0	**Skills**			
2.1	Identify & count different species in a collected mixture of algae from the Red Sea.	S1	-Lectures. -Lab work. -Class discussion. -Group discussion. -Brainstorming. - Field Trip.	-Quizzes -reports -Final examination. -Class discussion and participation. - Homework (Problem-solving).
2.2	Examine the prepared slides & make a list of all the species and their morphology	S2	-Lectures. -Lab work -Class discussion. -Group discussion. -Brainstorming.	-Quizzes -reports -Final examination. -Class discussion and participation.

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
				- Homework (Problem-solving).
2.3	Classify the different species of algae considering their morphology, cellular structure and pigmentation.	S3	-Lectures. -Lab work -Class discussion. -Group discussion. -Brainstorming.	-Quizzes -reports -Final examination. -Class discussion and participation. - Homework (Problem-solving).
3.0	**Values, autonomy, and responsibility**			
3.1	Work in a team and independently to conduct a specific project.	V1	-Lab demonstration. -Class discussion. -Group discussion. - Field Trip.	-Class discussion and participation. -Homework (Problem-solving).

C. Course Content

No	List of Topics	Contact Hours
1.	Course Introduction.	2
2.	Introduction, Diversity of Algae, Ecology & Distribution.	2
3.	Origins of algae & Environmental changes and evolution of algae Phylogeny of algae & Systematics basics.	2
4.	Classification and Groups of Algae according to Habitat, Pigmentation, Structure, Morphology and Modes of Reproduction (Part 1).	2

5.	Classification and Groups of Algae according to Habitat, Pigmentation, Structure, Morphology and Modes of Reproduction (Part 1).	2
6.	Photosynthesis – Algal Pigments Nutrients and primary production.	2
7.	Economic Importance of Marine and Freshwater Algae.	2
8.	Cyanophyta -Blue Green Algae, General Characters, Structure.	2
9.	Cyanophyta - Reproduction, Life Cycle & Endosymbiosis and Origination of Eukaryote.	2
10.	Rhodophyta - General Characters, Structure, Reproduction & Life Cycle & Calcification.	2
11.	Phaeophyta, General Characters, Structure, Reproduction & Life Cycle & Cues for Reproduction & Dispersal.	2
12.	Bacillariophyta, General Characters, Structure, Reproduction & Life Cycle.	2
13.	Euglenophyta, General Characters, Structure, Reproduction & Life Cycle.	2
14.	Algae in everyday life & Nutrition and Aquaculture & Economic Uses of Algae & Application.	2
15.	Algae and Biofuel.	2
	Total	**30**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Class Participation	During whole teaching period	5
2.	Homework (Problem-solving)	3 to 13	5
3.	Short Exams (Quizzes)	During whole teaching period	5
4.	Midterm Theoretical Examination	8-9	20
4.	Reports (For Practical)	During whole teaching period	10
5.	Final Practical Examination	15	15
6.	Final Theoretical Examination	17	40

*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	- Barsanti, L. and Gualtieri, P., 2022. Algae: anatomy, biochemistry, and biotechnology. CRC press. - Linda Graham, James M. Graham, Lee W. Wilcox, and Martha E. Cook . Algae (Third Edition) ,(2019) ISBN 978-0-9863935-3-2. - Seaweed ecology and physiology (Second Edition) —by Hurd, C. L., Harrison, P. J., Bischof, K., & Lobban, C. S. (2014).
Supportive References	- Duane J. 2008. A Photographic Guide to Seashore Life in the North Atlantic:Canada to Cape Cod. Princeton University Press, NJ. ISBN: 978-0-691-13319-5.224 pp. Softcover. - Villalard-Bohnsack M. 2003. Illustrated Key to the Seaweeds of New England. The Rhode Island Natural History Survey, Kingston, Rhode Island. ISBN: 1-887771- 07-7. 149 pp. Softcover. – copies of this reference book are provided for the lab.
Electronic Materials	- Websites on the internet that are relevant to the topics of the course: - http://www.algaebase.org/ - http://www.oilgae.com/algae/algae.html - http://www.alga-net.com/phycology/algaesites.htm - https://www.psaalgae.org/ - https://brphycsoc.org/ - http://intphycsociety.org/
Other Learning Materials	- Multimedia associated with the textbook and the relevant websites. - American society of microorganisms.

2. Required Facilities and equipment

Items	Resources
Accommodation .Classrooms, laboratories, demonstration rooms/labs, etc	- A sufficient number of classrooms to accommodate students - Well-equipped practical laboratories to accommodate students
Technology Resources (AV, data show, Smart Board, software, etc.)	- Data show - Wireless connection in the building for students and faculties.
Other Resources Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list	- Lecture slides. - Practical Manual Reference - Lab facilities, tools, and chemicals for alga culturing.

	- Well-equipped biology laboratory.

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	- Students. - Faculty members.	Indirect & direct: - Questionnaires. - Meetings.
Effectiveness of Students assessment	- Quality and development committee. - Department chair.	- Course report. - Program annual report.
Quality of learning resources	- Plan and program committee. - Students. - Staff members.	Indirect & direct: - Questionnaires. - Meetings. - Reports.
The extent to which CLOs have been achieved	- Quality and development committee. - Peer Reviewer. - Program leaders.	Indirect & direct: - Questionnaires. - Meetings. - Reports.
Other		

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	PROGRAMS AND STUDY PLANS COMMITTEE
REFERENCE NO.	
DATE	SEPTEMBER 2023