هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

2023
TPG-153

Course Specification
(Postgraduate)

Course Title:	Evolution and Biodiversity
Course Code:	BIOD502
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 (3 Theoretical + 0 Practical)

2. Course type

A.	☐University	☐College	☒ Department	☐Track
B.	☒ Required		☐Elective	

3. Level/year at which this course is offered: (Level 1/First Semester)

4. Course General Description:

This course is designed to introduce the student to evolutionary theory, its concepts, and the origin and scope of biodiversity. Also, it covers topics on evolutionary processes to generate and maintain biodiversity, Spatio-temporal patterns of biodiversity, and evolutionary relationships between specific groups of organisms. Further, it describes natural selection and its impact on biodiversity, ecological concepts, environmental changes, the origin of life, and the level of selection in different organisms. It also provides case studies on speciation, adaptation (e.g. adaptive radiation), spatial distribution concerning evolution, and biodiversity.

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

None.

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

None.

7. Course Main Objective(s):

- Describe the diversity of life patterns, and processes of its historical, and continuing evolution.
- Describe spatial distribution, speciation, extinction, coevolution, and the evolutionary framework.
- Understand how groups of living organisms are related to each other and how they evolved over the >3 billion years that life has existed on Earth.
- Understand, construct, and interpret evolutionary trees.
- Study the major features of plant and animal groups.
- Understand the origin of new species and lineages.

2. Teaching Mode: (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	45	100%
2	E-learning		
3	Hybrid • Traditional classroom		

No	Mode of Instruction	Contact Hours	Percentage
	• E-learning		
4	Distance learning		

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

No	Activity	Contact Hours
1.	**Lectures**	45
2.	**Laboratory/Studio**	
3.	**Field**	
4.	**Tutorial**	
5.	**Others (specify)……**	
	Total	45

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	Demonstrate deep knowledge of key concepts and principles of evolution and biodiversity, including mechanisms of evolution and patterns of biological diversity.	**K1**	- Lectures. - Seminars. - Class discussions. - Problem-solving classes. - Self-learning.	- Written exams (Midterm and Final exams). - Quizzes. - Class discussions.
1.2	Explain the biological basis and evidence supporting evolutionary theories and the origin of new species and lineages.	**K2**	- Lectures. - Seminars. - Class discussions. - Problem-solving classes. - Self-learning.	- Written exams (Midterm and Final exams). - Quizzes. - Class discussions.
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2.0	**Skills**			
2.1	Apply theoretical knowledge to analyze evolutionary patterns and processes,	**S1**	- Lectures. - Seminars. - Class discussions. - Problem-solving	- Written exams (Midterm and Final exams). - Quizzes.

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	including speciation and extinction events.		classes. - Self-learning. - Individual and group presentations. - Assignments. - Essays.	- Class discussions. - Individual and group presentations. - Assignments. - Essays.
2.2	Analyze the application of theoretical models and frameworks to understand evolutionary processes and biodiversity patterns.	**S2**	- Lectures. - Seminars. - Class discussions. - Problem-solving classes. - Self-learning. - Individual and group presentations. - Assignments. - Essays.	- Written exams (Midterm and Final exams). - Quizzes. - Class discussions. - Individual and group presentations. - Assignments. - Essays.
2.3	Evaluate the effectiveness of different research methods and tools used to study evolution and biodiversity.	**S3**	- Lectures. - Seminars. - Class discussions. - Problem-solving classes. - Self-learning. - Individual and group presentations. - Assignments. - Essays.	- Written exams (Midterm and Final exams). - Quizzes. - Class discussions. - Individual and group presentations. - Assignments. - Essays.
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3.0	**Values, autonomy, and responsibility**			
3.1	Demonstrate a critical awareness of how scientific inquiry addresses challenges in evolution and biodiversity.	**V2**	- Class discussions. - Individual and group presentations. - Assignments. - Essays.	- Class discussions. - Individual and group presentations. - Assignments. - Essays.

C. Course Content:

No	List of Topics	Contact Hours
1.	Introduction, and Generating Biodiversity.	3
2.	Evolution, Evidence, and Natural Selection.	3
3.	Microevolution – evolution within species.	3
4.	Macroevolution – the evolution of species and higher taxa.	3
5.	Species and Allopatric speciation.	3
6.	Phylogenetic, and constructing and interpreting evolutionary trees.	3
7.	Phylogenetic tree of life.	3
8.	Levels of Selection - Mitosis, Meiosis.	3
9.	Biodiversity: Bacteria, Archaea, Eukaryotes, Plants.	3
10.	Plants: Mosses, ferns, gymnosperms, angiosperms.	3
11.	Animals: invertebrates, Vertebrates.	3
12.	Trophic cascade Interrelationship: Competition, Predation, Mimicry, Symbiosis.	3
13.	Biomass and sexual selection.	3
14.	Case studies on evolution and biodiversity: Adaptation, Speciation, Spatial-distribution, etc…	3
15.	Case studies on evolution and biodiversity: Adaptation, Speciation, Spatial-distribution, etc…	3
Total		45

D. Students Assessment Activities:

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quizzes, Class discussions	Distributed over 14 weeks	10
2.	Assignments, Essays	Distributed over 14 weeks	15
3.	Individual or group presentation	Distributed over 14 weeks	10
4.	Midterm Exam	9	25
5.	Final Exam	17	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	- Grandcolas, P. and Maurei, M-C. (2018). Biodiversity and Evolution. ISTE Press – Elsevier. ISBN: 9781785482779. - Frankham, R., Ballou, J. D. and Briscoe, D. A. (2010). Introduction to Conservation Genetics. 2nd edition. Cambridge University Press.
Supportive References	- *Journal of Biodiversity.* - *Journal of Conservation Biology.*
Electronic Materials	- Saudi Digital Library. - UNSEDOC Digital Library. - www.sciencedirect.com.
Other Learning Materials	- None.

2. Educational and Research Facilities and Equipment Required:

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	- A sufficient number of classrooms are available to accommodate up to 25 students. - Library.
Technology equipment (Projector, smart board, software)	- 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)	- None

F. Assessment of Course Quality:

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	- Students.	- Direct & Indirect.
Effectiveness of student's assessment	- -Course instructors & Course coordinator (Teachers).	- Direct.
Quality of learning resources	- Students.	- Indirect.
The extent to which CLOs have been achieved	- Course instructors. - Course coordinator. - Quality Committee.	- Direct & Indirect.
Other		

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