هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

Course Specifications
(Postgraduate Degree)

Course Title:	**Evolution and Biodiversity**
Course Code:	**BIOD 502**
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 1/First year
4. Pre-requisites for this course (if any)**: None**
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 is designed to introduce the student to evolutionary theory, its concepts, the origin and scope of biodiversity. Also, it covers topics on evolutionary processes to generate and maintain biodiversity, Spatio-temporal patterns of the biodiversity, evolutionary relationships between with specific group of organisms. Further, it describes natural selection and its impact on biodiversity, ecological concepts, and 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.
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2. Course Main Objective

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

- 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.

3. Course Learning Outcomes

	Course Learning Outcomes (CLOs)	Aligned PLOs*
1	**Knowledge and Understanding:**	
1.1	Describe the biological basis and evidence of evolution and evidence and biological diversity.	K1
1.2	Recognize the role of natural selection in sustaining biological diversity.	K1
1.3	Describe the origin of new species and lineages.	K1
1…		
2	**Skills:**	
2.1	Analyze the evolution of animals from primitive to complex species.	S2
2.2	Explain the history of the establishment of plants and the evolution of their strains from the oldest to the most recent.	S1
2.3	Illustrate the basic characteristics of populations of living organisms and the interactions between different types of organisms within the ecosystem.	S1
2.4	Recognize the mechanisms of speciation and models of natural and sexual selection.	S3
2...		
3	**Values:**	
3.1	Draw a life tree diagram based on the evolutionary linkages between species.	V1
3.2	Examine the evolutionary relationships between the different animals as well as plant species and the ratio of similarity.	V2
3.3	Operate to conduct group reports and activities.	V3
3...		

* Program Learning Outcomes

C. Course Content

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

13	Case studies on evolution and biodiversity: Adaptation, Speciation, Spatial-distribution, etc…	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 the biological basis and evidence of evolution and evidence and biological diversity.	- Lectures. - Group discussions. - Brainstorming. - The use of educational techniques (Videos). - Student's seminars. - Individual presentation.	- Oral discussions. - Long and short essays. - Exams (Mid and Final) - Homework. - Quizzes.
1.2	Recognize the role of natural selection in sustaining biological diversity.		
1.3	Describe the origin of new species and lineages.		
1….			
2.0	**Skills:**		
2.1	Analyze the evolution of animals from primitive to complex species.	- Lectures. - Group discussions. - Brainstorming. - Simulation. - Research paper-based learning. - The use of interactive video. - Individual presentation.	- Peer assessment. - Self-evaluation. - Oral discussion. - Exams (Mid and Final) - Quizzes. - Individual and group presentations.
2.2	Explain the history of the establishment of plants and the evolution of their strains from the oldest to the most recent.		
2.3	Illustrate the basic characteristics of populations of living organisms and the interactions between different types of organisms within the ecosystem.		
2.4	Recognize the mechanisms of speciation and models of natural and sexual selection.		
2..			
3.0	**Values:**		
3.1	Draw a life tree diagram based on the evolutionary linkages between species.	- Research activities. - Oral presentations. - An internet search, assignments, and essays. - Group discussion. - Case studies. - Individual, and group presentations. - Case studies.	- Student's essays and assignments. - Group reports. - Group presentations. - Discussion in lectures. - Student's written participation. - Analytical - Case studies. - Posters.
3.2	Examine the evolutionary relationships between the different animals as well as plant species and the ratio of similarity.		
3.3	Operate to conduct group reports and activities.		

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods

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	- 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.
Essential Reference Materials	- *Journal of Biodiversity.* - *Journal of Evolution.*
Electronic Materials	- Saudi Digital Library. - UNSEDOC 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 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	