

Course Specification

(Postgraduate Programs)

Course Title: Plant and Animal Genetic Resources

Course Code: BIOD503

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 1/First year)

4. Course General Description:

This course offers a review of key biodiversity problems in natural and agricultural habitats, genetic population structure, molecular markers of genetic diversity, and economic values of biodiversity. It describes the plant and animal genetic resources, their collection, exploration, ex-situ, and in-situ conservation, and utilization of genetic resources in plant breeding. This course will cover the status of genetic remedies. Further, it describes the genetic resources of aquatic, rhizospheric airborne microorganisms.

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 restoration and conservation of plant and animal genetic resources.
- Document the agro-biodiversity and biodiversity of plant and animal genetic resources.
- Describe strategies used in-situ and ex-situ conservation of genetic resources.
- Justify the reason for conserving the genetic resources of plants and animals.
- Determine the microbial genetic resources.

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	Recognize the importance and utilization of plant and animal genetic resources.	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	Describe the role of microorganisms in different ecosystems, their interaction between plants & animals, and biogeochemical cycling.	K2	<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.
...				
2.0	Skills			
2.1	Analyze various methods for assessing and conserving plant, animal, and microbial genetic resources.	S2	<ul style="list-style-type: none"> - Lectures. - Practical sessions. - Field works. - Seminars. - Class discussions. - Problem-solving classes. 	<ul style="list-style-type: none"> - Written exams (Midterm and Final exams). - Quizzes. - Laboratory reports. - Field reports. - Class





Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
			<ul style="list-style-type: none"> - Self-learning. - Individual and group presentations. - Assignments. 	<ul style="list-style-type: none"> discussions. - Individual and group presentations. - Assignments.
2.2	Evaluate the present scientific studies of genetic and functional microbial diversity in different 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	Design strategies for assessing and conserving plant, animal, and microbial genetic resources.	S4	<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.
...				
3.0	Values, autonomy, and responsibility			
3.1	Demonstrate responsibility and ethical use of databases in the analysis and conservation	V1	<ul style="list-style-type: none"> - Class discussions. - Individual and group presentations. - Practical 	<ul style="list-style-type: none"> - Class discussions. - Individual and group presentations.



Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
	of genetic resource diversity.		sessions. - Field works. - Assignments.	- Laboratory reports. - Field reports. - Assignments.
...				

C. Course Content:

No	List of Topics	Contact Hours
1.	Introduction and aspects of diversification.	2
2.	Genetic resource and principles of its conservation.	2
3.	Plant genetic resources for food and agriculture.	2
4.	Wild plant population and population genetics.	2
5.	Agricultural and horticultural genetic resources.	2
6.	Plant breeding- commercial crops and wild food plants.	2
7.	Forest genetic resources – DNA banking (Germplasm).	2
8.	Animal genetic diversity - Animal gene bank (Germplasm).	2
9.	Developing a patent indicator for plant and animal genetic resources - species richness, dominant and rare species (Part I).	2
10.	Developing a patent indicator for plant and animal genetic resources - species richness, dominant and rare species (Part II).	2
11.	Farming of plant and animal resources- Key technologies in animal breeding.	2
12.	Diversity of microbial resources (aquatic, rhizospheric, and airborne).	2
13.	Genetic erosion- case studies of endemic, endangered, and extinct species.	2
14.	In situ conservation (Global biodiversity – Agrobiodiversity).	2
15.	Ex-situ conservation - Rationalization of ex-situ conservation.	2
Total		30

D. Students Assessment Activities:

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quizzes, class discussions, Assignments.	Distributed over 14 weeks	10
2.	Individual or group presentation	Distributed over 14 weeks	10





No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
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"> - Payne, W. J. A. and Willson, R.T. (1999). An introduction to animal husbandry in the tropics. Longman, New York, USA. - Ten Kate, K. and Laird, S. A. (1999). The commercial use of biodiversity: Access to genetic resources and benefit-sharing. Earthscan Publications Ltd, London, UK. - Van Zonneveld, M., Dawson, I., Thomas, E., Scheldeman, X., van Etten, J., Loo, J. and Hormaza, J. H. (2014). Genomics of Plant Genetic Resources. Publisher: Springer. - Frison, C., Lopez F. and Alcazar, F. T. E. (2011). Plant Genetic Resources and Food Security. ISBN: 978-1-84971- 205-7.
Supportive References	<ul style="list-style-type: none"> - <i>Journal of Genetic Resource.</i> - <i>Journal of Animal Genetic Resources.</i> - <i>Journal of Conservation.</i> - NCBI GenBank overview.
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
<p>facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)</p>	<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	- Students.	- Direct & Indirect.
Effectiveness of students' assessment	- Course instructors & Course coordinator (Teachers).	- Direct.
Quality of learning resources	- Students.	- 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	- 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

