



# Course Specification

## (Bachelor)

Course Title: **Plant Ecology**

Course Code: **BIOL\_344**

Program: **BIOLOGY**

Department: **BIOLOGY DEPARTMENT**

College: **College of science**

Institution: **Majmaah University**

Version: **4<sup>th</sup>**

Last Revision Date: **26 December 2023**



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## A. General information about the course:

### 1. Course Identification

#### 1. Credit hours: 3( 2+1 )

Equivalent to ECTS Credit Point: 4.5

#### 2. Course type

- A.  University  College  Department  Track  Others
- B.  Required  Elective

#### 3. Level/year at which this course is offered: ( 5/ third year )

#### 4. Course General Description:

This course deals with the basic concepts of plant and their relationship with environment. This course explains the mechanism of plant interactions with other plant, animal and ecosystem. In addition to this course, demonstrate how plant defend themselves from attack. This course also helps to learn importance of forest ecosystem and plant used as ecological indicators

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

BIOL 223, Plant Physiology; BIOL 241 Ecology

#### 6. Co-requisites for this course (if any):

N/A

#### 7. Course Main Objective(s):

The main objective of this course to understand the adaptation mechanism between plants and their ecosystem.

### 2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	60	80%
2	E-learning	15	20%
3	Hybrid <ul style="list-style-type: none"> <li>• Traditional classroom</li> <li>• E-learning</li> </ul>		
4	Distance learning		



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

No	Activity	Contact Hours
1.	Lectures	30
2.	Laboratory/Studio	30
3.	Field	0
4.	Tutorial	0
5.	Others (specify)	0
<b>Total</b>		<b>60</b>

### Workload (based on academic semester)

No	Activity	Work load (In hours )
1.	Contact hrs	60
2.	Self –study hours or Academic learning hours ( Assignments, quizzes, reports, discussions, library , research....)	60
<b>Total Workload</b>		<b>120</b>
<b>Equivalent to ECTS Credit Pionts</b>		<b>4.5</b>

### 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
<b>1.0</b>	<b>Knowledge and understanding</b>			
1.1	Recognize the basic of plant communities and ecosystem.	K2	Lectures, Videos, Group discussion,	Midterm 1 Midterm 2 Final exam Quizzes. Class exercises E exam
1.2	Describe – types of plant interactions and defense mechanisms	K2	Lectures , online course on future	Midterm 1 Midterm 2 Final exam





Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
			X( the national e-learning platform	
...				
<b>2.0</b>	<b>Skills</b>			
2.1	Interpret the different types of ecological classification of plants, ecological indicators and plant succession stages	<b>S1</b>	Lectures, Videos, Group discussion, Brain storming, Critical thinking	Midterm 1 Midterm 2 Final exam
2.2	Predict the adaptation of plant based on environmental relationship	<b>S1</b>	Lectures, Videos, Group discussion, Brain storming, Critical thinking	Short answer, Fill in the blanks, Diagram
...	Performing laboratory experiment on soil types, plant defense mechanisms (mechanical, chemical) and plant species diversity by quadrat method	<b>S4</b>	Lab experiment, videos, diagrams Labs reports	Practical Exam group presentation Group research Assignment
<b>3.0</b>	<b>Values, autonomy, and responsibility</b>			
3.1	Committee toward group tasks in plant ecosystem and contributing ideas	<b>V3</b>	Homework, and group discussion	Reports, Homework Rubrics of behavior and performance in the lab.
3.2	Effective communication of scientific concepts	<b>V3</b>	Group discussion	Oral presentation
...				

### C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to Ecology – Definitions; Plants and Environment: Autecology and Synecology	2
2.	Plant Communities and Ecosystem: Forest, Grassland, Desert, Vegetation layers	2





3.	Plant Adaptations and Ecological classification of Plants: (1) Hydrophytes (2) Hygrophytes (3) Mesophytes (4) Xerophytes and (5) Halophytes – Mangrove plants	8
4.	Interactions among Plants: Commensalism ,Parasitism, Mutualism and Competition	4
5.	Defensive Chemicals by Plants Secondary metabolites (Terpenes, Phenolic compounds, Alkaloids).	4
6.	Plant succession Types, Sere and seral stages, Process of plant succession.	2
7.	Plants as ecological indicators Characteristics features and different Types of ecological indicators – agriculture, ground water, forest, humus, soil types, pollution, minerals	4
8.	Agriculture and Its Importance: Modern agriculture, Fertilizers impact, crop rotation, pest management.	2
9.	Forests, Forest management, Forest conservation.	2
10.	Practical : <ul style="list-style-type: none"> <li>• Experiment on community structure study</li> <li>• Determination of percentage, frequency, density and abundance by quadrat method</li> <li>• Experiment on Soil science ( water holding capacity – PH- Salinity)</li> <li>• Experiment on phenotypic plasticity</li> <li>• Study plant habitat and adaptation (sample for xerophytic plantmesophytic-hydrophytic plant)</li> <li>• Examine anatomical adaptation for xerophytic plant samplemesophytes plant- hydrophytes plants – halophytes plants )</li> <li>• Observation of chemical defenses of plant against pathogen.</li> </ul>	30
11.		
12.		
<b>Total</b>		<b>60</b>

#### D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Mid- term I exam	5 <sup>th</sup> - 6 <sup>th</sup> week	10%
2.	Mid-term II exam	9 <sup>th</sup> -10 <sup>th</sup> week	10%
3.	Quiz, Oral test and Home works	Every two weeks	10%
4.	E exam (online)	11 <sup>th</sup> week	10%
5.	Practice exam	14-15 <sup>th</sup> week	20%
6.	Final exam	16 <sup>th</sup> week	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

<b>Essential References</b>	Short notes on Plant Ecology, Dr. Vijayakumar – Note book, Majmaah University
<b>Supportive References</b>	A TEXTBOOK ON PLANT ECOLOGY –Devasahayam Agri BioVet Press; 2019; ISBN:9789384502898 • Plant Ecology and Phytogeography V. Kumaresan; N. Arumugamv-Saras Publications, Indiav-2014v- ISBN : 9789384826703 Practical Manual of Plant Ecology and Plant Physiology -Soundara S. Rajan Anmol Publisher 2003 ISBN-10: 9788126109630
<b>Electronic Materials</b>	Journal of Plant Ecology <a href="https://academic.oup.com/jpe">https://academic.oup.com/jpe</a> • Plant ecology and evolution <a href="https://www.plecevo.eu/index.php/plecevo">https://www.plecevo.eu/index.php/plecevo</a>
<b>Other Learning Materials</b>	Electronic materials of Lecture notes and PowerPoints available in 'Black board' database

### 2. Required Facilities and equipment

Items	Resources
<b>facilities</b> (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom
<b>Technology equipment</b> (projector, smart board, software)	Smart board and e podium available
<b>Other equipment</b> (depending on the nature of the specialty)	Library and seminar room Wi-Fi internet connections

## F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Direct assessment
Effectiveness of Students assessment	Program leader	Direct assessment
Quality of learning resources	Students	Indirect assessment
The extent to which CLOs have been achieved	Faculty	Direct assessment
Other		

**Assessors** (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify))

**Assessment Methods** (Direct, Indirect)





## G. Specification Approval

<b>COUNCIL /COMMITTEE</b>	<b>BIOLOGY DEPARTMENT COUNCIL</b>
<b>REFERENCE NO.</b>	<b>7</b>
<b>DATE</b>	<b>4/4/1446 H (07/10/2024)</b>

