



Course Specifications

Course Title:	Principles of Ecology
Course Code:	211 Bio-2
Program:	Biology
Department:	Biology
College:	Sciences and Art College
Institution:	Najran University

Table of Contents

A. Course Identification	3
6. Mode of Instruction (mark all that apply)	3
B. Course Objectives and Learning Outcomes	4
1. Course Description	4
2. Course Main Objective	4
3. Course Learning Outcomes	4
C. Course Content	5
D. Teaching and Assessment	6
1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods.....	6
2. Assessment Tasks for Students	7
E. Student Academic Counseling and Support	7
F. Learning Resources and Facilities	7
1. Learning Resources	7
2. Facilities Required	8
G. Course Quality Evaluation	8
H. Specification Approval Data	9

A. Course Identification

1. Credit hours: 2
2. Course type
a. University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Others <input type="checkbox"/>
b. Required <input type="checkbox"/> Elective <input type="checkbox"/>
3. Level/year at which this course is offered: level 5 / third year
4. Pre-requisites for this course (if any):
5. Co-requisites for this course (if any):

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	30	100%
2	Blended		
3	E-learning		
4	Correspondence		
5	Other		

7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
Contact Hours		
1	Lecture	30
2	Laboratory/Studio	
3	Tutorial	
4	Others (specify)	
	Total	30
Other Learning Hours*		
1	Study	37
2	Assignments	3
3	Library	10
4	Projects/Research Essays/Theses	5
5	Others(specify): Office hours	10
	Total	65

*The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

B. Course Objectives and Learning Outcomes

1. Course Description

Ecology is the study of how organisms interact with each other and their environment at the population, community, and ecosystem levels. The goal of this course is familiarize you with ecological theory and its applications. An introduction to the interactions between living organisms and their physical, chemical and biological environment. Several levels of ecological organization are examined. These include the study of different types of populations, communities and ecosystems. Topics include population structure and growth, species interaction, energy flow, nutrient cycling, succession, and applications to current environmental management issues. Students perform ecological experiments in the field as well as in the laboratory. Two class hours, one conference hour, three laboratory hours.

2. Course Main Objective

The main learning goals I hope you will all accomplish by the end of the quarter are:

- Describe major habitats found on land and in water and explain adaptations of organisms to the variation in abiotic factors found in major habitat types.
- Explain the use of distribution patterns, life tables, age structures, survivorship curves and population growth curves in describing the structure of populations.
- Describe factors that affect the outcome of competitive interactions between individuals of different species and outline other types of interactions that may occur between organisms.
- Describe the relationships between predator and prey populations and outline the structure of food webs and trophic interactions in a community.
- Trace the flow of energy through an ecosystem and describe some major biogeochemical cycles associated with ecosystem function.
- Discuss some of the current applied ecological issues including the effects of habitat fragmentation and loss, invasive species, and pollution.
- To gain an understanding of the broad biological significance of ecological theory.
- To gain an understanding of the questions that ecologists study, the methods they use, and the questions that remain unanswered.
- To develop your ability to apply quantitative skills to analyze and interpret ecological data.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	Knowledge:	
1.1		
1.2		
1.3		
1...		
2	Skills : Cognitive	
2.1		
2.2		
2.3		
2...		
3	Competence: interpersonal Communication Psychomotor	
3.1		

CLOs		AlignedPLOs
3.2		
3.3		
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Ecology: What, Why, How and Where	2
2	Constituents of the Environment: Abiotic Factors: <ul style="list-style-type: none"> ▪ Temperature. ▪ Water. ▪ Salinity. ▪ Sunlight. ▪ Carbon dioxide. ▪ Effects of temperature and Carbon dioxide (greenhouse effects; global warming). 	2
3	Constituents of the Environment: Biotic Factors (PART 1): <ul style="list-style-type: none"> ▪ Relationship between animals and plants. ▪ Beneficial & harmful relationships. ▪ Relationships between organisms. ▪ Competition (Intraspecific & Interspecific) 	2
4	Constituents of the Environment: Biotic Factors (PART 2): <ul style="list-style-type: none"> ▪ Consumption (Herbivory, Predation, Commensalism, Mutualism, Parasitism). ▪ Amensalism. ▪ Antibiosis or allelopathy 	2
5	Distribution - Dispersal & Migration <ul style="list-style-type: none"> ▪ Dispersal. ▪ Migration. ▪ Dispersion. 	2
6	Natural Biogeochemical cycles (PART 1) <ul style="list-style-type: none"> ▪ Water cycle. ▪ Oxygen cycle. ▪ Carbon cycle. 	3
7	First Midterm Exam	2
8	Natural Biogeochemical cycles (PART 2) <ul style="list-style-type: none"> ▪ Nitrogen cycle. ▪ Phosphorous cycle. ▪ Sulphur cycle. 	3
9	Ecological succession: <ul style="list-style-type: none"> ▪ Causes of succession. ▪ Invasion of pioneers. ▪ Types of ecological succession (primary & secondary successions, Hydrarch & Xerarch successions). 	2
10	Food chains, food webs, trophic pyramids	2
11	Types of ecosystems: <ul style="list-style-type: none"> ▪ Terrestrial ecosystems. ▪ Aquatic ecosystems. 	2

	▪ Adaptations of animals and plants to ecosystems.	
12	Second Midterm Exam	2
13	The biomes (PART 1) ▪ Tundra. ▪ Taiga. ▪ Deciduous temperate forests. ▪ Grasslands.	2
14	The biomes (PART 2) ▪ Chaparral. ▪ Desert. ▪ Tropical wood and shrub land (Savannah). ▪ Tropical rainforest biome. ▪ Environments without life.	2
Total		30

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	Knowledge:		
1.1	Know the fundamental concepts, theories and principles of modern ecology.	Theoretical & exams (Mid + Quizzes+ final exam)	Theoretical Exam
1.2	Recognize an up-to-date knowledge of the major areas of ecology.	Theoretical & exams (Mid + Quizzes+ final)	Theoretical Exam
1.3	Interpret ecological problems using qualitative and quantitative measurements, statistical, mathematical, and use of information technology		
2	Skills : Cognitive		
2.1	Compare and integrate data and information from different scientific resources.	Exams, quizzes, Homework oral question and exams, Tutorial discussion	Exams – discussion
2.2	Develop skills of critical thinking and analytical reasoning of current theories and hypotheses.	Individual and group reports, open class discussion.	performance and reports
2.3	Evaluate collected data, ensuring validity, accuracy, reliability and replicability.		
3	Competence: Interpersonal Communication Psychomotor		
3.1	Prepare the laboratory and field facilities to carry out certain experiments	Quizzes, Homework & group reports, oral discussions.	Research reports - presentations
3.2	Examine and critically evaluate the ecological data to prepare reports.	Oral presentation, homework reports, videos/ pictures /slides	exam

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
		with questions and responses.	
...		Exam, oral presentation,	exam

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quizzes, Class activities including (participation in open discussions, speech, oral presentations, group reports, essays) and attendance.	continuous	5 %
2	First Mid term exam (multiple choice- short assay- labeling – drawing- memorizing – discussion- solving problems).	5 th week	20%
3	activities (log book- student work -working in groups).	continuous	5%
4	Second mid term exam	6 th week	20%
5	Final exam (multiple choice- short assay- drawing- memorizing – discussion- solving problems).	15-16 th week	50%

*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 :

- Six office hours per week are offered to support students individually.
- Reachable via email.
- Personal web pages of academic members staff in university website.

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	<ol style="list-style-type: none"> 1. Smith, R. L. and Smith, T. M. (2011). Elements of Ecology 6th edition Pearson Education. 2. Manuel Molles; Manuel C. Molles (2009). “Ecology: Concepts and Applications” Edition: 5th McGraw- Hill Higher Education 572 pages. 3. Townsend et al. 2003. Essentials of Ecology . 4. Odum EP & Barrett GW (2005). Fundamentals of Ecology. 5th. Edition Brookes Cole. 5. Manuel, C. M. 1999. Ecology: Concepts and Applications. W C B/McGraw-Hill. 6. Ricklefs R.E., Miller G.L. (2000) Ecology. John Wiley & Sons, New York.
---------------------------	--

	7. Robert Leo Smith; Thomas M. Smith (2008). Elements of Ecology, 7th Ed. Benjamin-Cummings Publishing Company.
Essential References Materials	<ol style="list-style-type: none"> 1. Begon, M., Townsend, C. R. and Harper, J. L. (2009). Ecology: From Individuals to Ecosystems. ISBN: 9781405111171. Blackwell Publishing. 2. R. A. Perry and D. W. Goodall. 2009. Arid Land Ecosystems 2 Volume Set: Volume 1: 3. Structure, Functioning and Management (International Biological Programme Synthesis Series.
Electronic Materials	<ol style="list-style-type: none"> 1. http://www.springer.com/earth+sciences+and+geography/geography/journal/40333 2. http://www.tandfonline.com/action/aboutThisJournal?journalCode=uasr20 3. http://www.enviroliteracy.org/category.php/3.html (Environmental Literacy Council: Ecosystems) 4. http://conbio.net/v1
Other Learning Materials	Lab. Notes: Will be distributed to the students by the lecturer

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Lecture room (8 x 15m) equipped with about 20 student seats, Lab. (8 x 15 m) equipped with about 20 student seats.
Technology Resources (AV, data show, Smart Board, software, etc.)	White Board, computer, Data Show, Overhead projector and laptop.
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	Library, and Seminar Room and Wi-Fi internet connections Well-equipped laboratory with dissecting microscopes and stereo microscopes. - Permanent slides - Slides and covers - Fresh specimens - Preserved specimens - Chemical reagents

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Feedback on effectiveness of teaching	Students	Indirect (by questionnaire)
Extent of achievement of course learning outcomes	Course coordinator	Direct
Quality of learning resources	Internal Audit Committee	Indirect (by questionnaire)

Evaluation areas (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	Internal Audit Committee
Reference No.	
Date	