



Course Specifications

| | |
|---------------|--------------------------------|
| Course Title: | Fundamentals of Ecology |
| Course Code: | 301BIO-2 |
| Program: | Bachelor of Science in Biology |
| Department: | Biology |
| College: | Science |
| Institution: | Jazan University |

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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 checked="" type="checkbox"/> | Elective <input type="checkbox"/> | |
| 3. Level/year at which this course is offered: 5 th Level / 3 rd Year | | | |
| 4. Pre-requisites for this course (if any): Non | | | |
| 5. Co-requisites for this course (if any): Non | | | |

6. Mode of Instruction (mark all that apply)

| No | Mode of Instruction | Contact Hours | Percentage |
|----|-----------------------|---------------|------------|
| 1 | Traditional classroom | 36 h | 83.3% |
| 2 | Blended | 6 h | 16.7% |
| 3 | E-learning | | |
| 4 | Distance learning | | |
| 5 | Other | | |

7. Contact Hours (based on academic semester)

| No | Activity | Contact Hours |
|----|-------------------|---------------|
| 1 | Lecture | 14 |
| 2 | Laboratory/Studio | 26 |
| 3 | Tutorial | |
| 4 | Others (specify) | |
| | Total | 40 |

B. Course Objectives and Learning Outcomes

1. Course Description

| Course Title | Course Code | Number of Study Hours | | | | Year | Level | Prerequisites |
|-------------------------|-------------|-----------------------|------|------|--------|------|-------|---------------|
| | | Theo. | Tut. | Lab. | Credit | | | |
| Fundamentals of Ecology | 301BIO | 1 | | 2 | 2 | 3rd | 5th | - |

(1) Brief Course Description

Introduction to ecological concepts, and the applications of this science in reducing environmental pollution.

(2) Course Objectives

This course is designed to provide students with the following concepts:

1. Identify environmental factors.
2. Study the impact of environmental factors on the ecosystem.
3. Explain the human role in the environment positively and negatively.
4. Awareness of the importance of the environmental protection from pollution.

(3) Course Contents

a. Theoretical part:

1. Introduction to Ecology: Concept of ecology and its fields and its relation to other sciences.
2. The ecosystem: The components of the natural ecosystem and the types of ecosystems, Living and non-living environmental factors and their impact on living organisms.
3. Effect Environment on the physical, anatomical and physiological aspects of organisms. Energy conservation in the natural ecosystem.
4. Living organisms and levels of nutrition, food chains and food webs - ecological pyramids.
5. Ecosystem Balance - natural ecosystems - conservation of natural resources, tolerance of organisms to chemical and physical agents, Natural environment.
6. Biogeochemical elements cycle: water, carbon, oxygen, nitrogen, phosphorus cycles.
7. Environmental pollution: Water pollution, food contamination, air Pollution soil pollution, desertification, radiation pollution, noise pollution, thermal pollution, electromagnetic pollution, climate change, global warming and Ozone layer depletion.

b. Practical part:

1. Methods of measuring environmental factors (temperature, wind, atmospheric pressure, rain, relative humidity, Soil analysis, Scientific field trip to the meteorological station at the Center of Environmental Studies and Research.

(4) Assessment Criteria

- Quizzes , Midterm Exam and Assignments : 20 %
- Practical Section: 30 %
- Final exam: 50%

(5) Course Teaching Strategies

- Lectures, Reports and Essay Assignments, Homework, and Web-based Assignments.

(6) Text Book

• Hayati, A. A. (2007). *Fundamentals of Ecology(in arabic)*, First Ed., Dammam, Saudi Arabia.

(7) Reference Books

- Al-Oudat, Mohamed Abdo and Abdullah Yahya Basahey (2001), Pollution and Environmental Protection, Deanship of Library Affairs, King Saud University, Riyadh - Saudi Arabia.
- Alyaa Atokh Boran and M. Abo Deyah (2014) Ecology 4th Eddition, Amman, Jordan.
- Molles M.C.(2015) Ecology: Concepts and Applications 7th Edition, McGraw Hill, New York.
- General Authority for Meteorology and Environmental Protection Saudi Arabia <http://www.pme.gov.sa>
- Saudi Wildlife Authority Website <http://www.swa.gov.sa/index.php/en>

2. Course Main Objective:

This course is designed to provide students with the following concepts:

1. To introduce the students to the concept of ecology, its divisions, and components
2. Relationships within the ecosystem.
3. Identify environmental factors.
4. Study the impact of environmental factors on the ecosystem.
5. Explain the human role in the environment positively and negatively.

Awareness of the importance of the environmental protection from pollution.

3. Course Learning Outcomes

| CLOs | | Aligned PLOs |
|------|--|--------------|
| 1 | Knowledge and Understanding | |
| 1.1 | Demonstrate structures, features, and processes related to Ecosystem.. | K1 |
| 1.2 | Identify items and their related functions on diagrams, | K2 |
| 1.3 | State hypotheses and theories related to Ecology. | K3 |
| 1... | | |
| 2 | Skills : | |
| 2.1 | Explain aspects, theories, and processes relevant to Ecology, | S1 |
| 2.2 | Compare different structures and features related to Ecosystems . | S2 |
| 2.3 | Interpret experimental data. | S3 |
| 3 | Values: | |
| 3.1 | Illustrate ability to work in groups and responsibility, | V1 |
| 3.2 | Demonstrate risk assessment and safety, | V2 |
| 3.3 | | |
| 3... | | |

C. Course Content

Theoretical Content

| No | List of Topics | Contact Hours |
|----|--|---------------|
| 1 | Introduction to Ecology: Concept of ecology and its fields and its relation to other sciences. | 1 |
| 2 | The ecosystem: The components of the natural ecosystem and the types of ecosystems. | 1 |
| 3 | Living and non-living environmental factors and their impact on living organisms. | 1 |
| 4 | Effect Environment on the physical, anatomical and physiological aspects of organisms. | 1 |
| 5 | Energy conservation in the natural ecosystem. | 1 |
| 6 | Living organisms and levels of nutrition, food chains and food webs - ecological pyramids. | 1 |
| 7 | Ecosystem Balance - natural ecosystems - conservation of natural resources. | 1 |
| 8 | Tolerance of organisms to chemical and physical agents. | 1 |
| 9 | Biodiversity | 1 |
| 10 | Biogeochemical elements cycle: water, carbon, oxygen, nitrogen, phosphorus cycles. | 1 |
| 11 | Biogeochemical elements cycle: nitrogen, phosphorus and sulfur cycles. | 1 |
| 12 | Environmental pollution: Water and food pollution, air and soil pollution. | 1 |

| | | |
|--------------|---|-----------|
| 13 | Desertification, radiation, noise pollution, thermal pollution, electromagnetic pollution, climate change, global warming and Ozone layer depletion | 1 |
| 14 | renewable Energy | 1 |
| Total | | 14 |

Practical Content

| No | List of Topics | Contact Hours |
|--------------|--|---------------|
| 1 | Introduction to Ecology and Lab. safety | 2 |
| 2 | Abiotic factors or non-living factors that impact an ecosystem. | 2 |
| 3 | Effect of Temperature in ecosystem | 2 |
| 4 | Effect of Humidity in ecosystem | 2 |
| 5 | Effect of Rain in ecosystem | 2 |
| 6 | Effect of Light in ecosystem | 2 |
| 7 | Effect of Wind in ecosystem | 2 |
| 8 | Effect of Oxygen in ecosystem | 2 |
| 9 | Effect of Salinity (the concentration of salt in water) in ecosystem | 2 |
| 10 | Effect of Radiation in ecosystem | 2 |
| 11 | Effect of Soil composition in ecosystem | 2 |
| 12 | Soil analysis | 2 |
| 13 | Effect of Pollution in ecosystem | 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 | Demonstrate structures, features, and processes related Ecology. | Lectures, | Quizzes, Short Answer Question, MCQs |
| 1.2 | Identify the items and their related functions on the diagram. | Lectures, Lab work | Quizzes, Short Answer Question, MCQs |
| 1.3 | State hypothesis and theories related to Ecology. | Lectures, Group Discussion | Assignments |
| 2.0 | Skills | | |
| 2.1 | Explain aspects relevant in Ecology. | Lectures, Lab work | Quizzes, Short Answer Question |
| 2.2 | Compare the different structures and features related to Ecosystems. | Lectures, Lab work, Group Discussion | Quizzes, Short Answer Question, Lab work assessment |
| 2.3 | Interpret experimental data. | Lab work | Short Answer Question, Assignments |
| 3.0 | Values | | |
| 3.1 | Illustrate ability to work in groups and peer individual responsibility | Group Discussion, Lab work | Lab work assessment |
| 3.2 | Demonstrate risk assessment and safety responsibilities in their fields. | Lab work | Lab work assessment |
| 3.3 | Illustrate ability to work in groups and peer individual responsibility | Group Discussion, Lab work | Lab work assessment |

2. Assessment Tasks for Students

| # | Assessment task* | Week Due | Percentage of Total Assessment Score |
|---|-------------------------|----------|--------------------------------------|
| 1 | Written assignment | 3 | 3 |
| 2 | Group assignment | 4 | 2 |
| 3 | Theoretical quiz | 5 | 5 |
| 4 | Mid-term exam | 7 | 10 |
| 5 | Practical Mid-term exam | 9 | 10 |
| 6 | Practical assignment | 11 | 5 |
| 7 | Final practical exam | 13 | 15 |
| 8 | Final Exam | 15 | 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 :
10 Office hours/faculty/week.

F. Learning Resources and Facilities

1. Learning Resources

| | |
|---------------------------------------|---|
| Required Textbooks | Hayati, A. A. (2007). <i>Fundamentals of Ecology (in Arabic)</i>, First Edition, Dammam, Saudi Arabia. |
| Essential References Materials | <ul style="list-style-type: none"> Al-Oudat, Mohamed Abdo and Abdullah Yahya Basahey (2001), Pollution and Environmental Protection (in Arabic) , Deanship of Library Affairs, King Saud University, Riyadh - Saudi Arabia. Alyaa Atokh Boran and M. Abo Deyah (2014) Ecology (in Arabic) 4th Eddition, Amman, Jordan. Molles M.C.(2015) Ecology: Concepts and Applications 7th Edition, McGraw Hill, New York. Molles M.C. (2008) Ecology. McGraw Hill, New York. Botkin D.B. Keller E.A. (2007) Environmental Science. Wiley, New York. |
| Electronic Materials | <ul style="list-style-type: none"> General Authority for Meteorology and Environmental Protection Saudi Arabia http://www.pme.gov.sa Saudi Wildlife Authority Website http://www.swa.gov.sa/index.php/en |
| Other Learning Materials | |

2. Facilities Required

| Item | Resources |
|--|--|
| Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) | 1 Lecture room(s) for groups of 50 students. 1 Laboratory for group of 25 students. |
| Technology Resources (AV, data show, Smart Board, software, etc.) | AV, data show, Smart Board |
| Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list) | Light microscopes, glassware, chemicals, consumables, dissection tools. |

G. Course Quality Evaluation

| Evaluation Areas/Issues | Evaluators | Evaluation Methods |
|---|-------------------|------------------------------|
| Effectiveness of teaching | Students, Faculty | Direct (Questionnaire) |
| Effectiveness of assessment | Peer Reviewer | Direct (Cross Check marking) |
| Extent of achievement of course learning outcomes | Program Leader | Indirect (QA Committee) |
| Quality of learning resources | QA. Committee | Indirect (Benchmarking) |
| | | |

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 | Consultant Committee/ Board of Biology Department |
| Reference No. | |
| Date | |