



Department of: Biology

College of: Education

University of: Salahadin

Subject: Ecology

Course Book – 3rd Year

Lecturer's name BSc, MSc, PhD Abdulla Hamad Aziz

Academic Year: 2023/2024

Course Book

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| 1. Course name | Ecology |
| 2. Lecturer in charge | Dr. Abdulla Hamad Aziz |
| 3. Department/ College | Biology/ Education |
| 4. Contact | e-mail: abdulla.aziz@su.edu.krd bilbas2004@gmail.com |
| 5. Time (in hours) per week | 4 |
| 6. Office hours | Sunday 08:30 –12:30 or by appointment. Wednesday 08:30 – 12:30 or by appointment. |
| 7. Course code | |
| 8. Teacher's academic profile | B.Sc. in Biology at Biology Department, Education College, University of Salahadin (1999). M.Sc. in Ecology and Phycology at Biology Department, Education College, University of Salahadin (2004). Assistant lecturer at Biology Department, Education College, University of Salahadin (2004). Ph.D. in Ecology and Pollution at Biology Department, Education College, University of Salahadin (2014). Currently Lecturer at Biology Department, Education College, University of Salahadin (2014). |
| 9. Keywords | Biology Dept., Education College, 3rd stage, Ecology, Salahadin University, Erbil, Kurdistan Region of Iraq. |
| 10. Course overview: | <p>This course introduces basic concepts in the ecology and pollution including definition, history and subdivision of ecology. Emphasis on biotic and abiotic factors of an ecosystems, major kinds of ecosystem, also the trophic level and energy flows through ecosystem, with the relationships in living communities. Elucidating the important biogeochemical cycles, population ecology and community dynamics. Concentrates on current issues in ecology that contributed with ozone depletion and global warming. Besides that, this course will focus on understanding and reducing pollution. Explaining the atmospheric transport and dispersion of pollutants, strategies to assess and regulate pollution of water, contamination threat to soil, pollutants toxicity and environmental management.</p> <p>The discussion section is designed to complement, and not just reiterate, the materials covered in lecture. Recent journal articles related to lecture topics will be assigned each week for discussion, in order to familiarize students with peer-reviewed journals, scientific writing, and the current issues in ecology. The goal is for students to practice reading and understanding scientific articles, and to realize that the facts and ideas presented in lecture and the text are derived through experimentation and sometimes controversy. Students will also learn to research a topic in ecology and to write a scientific literature review by completing the term paper assignment.</p> |

11. Course objective:

The goals of this course are:

1. Understanding the specific interaction between living and non living factors of ecology; with explain the functioning of biological communities.
2. Providing students with modern view about current ecological issues; human influences on recent ecological events and nutrients cycle in the land.
3. Presenting environmental concerns about global warming; emphasis on reducing processes of the major factors that contributed with this concern.

12. Student's obligation

Students are expected to keep up with the course schedule and read the chapters before coming to class and be prepared to engage in classroom discussions. Although classroom discussions are expected to be an integral part of this semester, the direction of each conversation is under the total direction of the instructor. Attendance and completion of all exams is mandatory. Students are accountable for all class assignments, class announcements, handouts, and information provided in lecture. If you must miss an exam,, then you must contact me as quickly as possible. Additionally, please do not ask to postpone an exam on the day of the exam. If you have other exams on the same day, bring it to my attention before the exam date .

13. Forms of teaching

Digital copy (both Pdf and Ppt) of each lecture will be send to each student who send an empty email through his/her email address to the auto email (Ecology.hali@gmail.com) replay with attached zip file contain both Pdf and Ppt files of the current weekly lecture before they obtain their hard copy before the lecture day. All the covered topics will be presented as power point presentations.

14. Assessment scheme

The students are required to do two theoretical exams at different periods of the semester (27% Theory plus 13% Practical). Final examination has (40% Theory plus 20% Practical). This will make a (100%) of the students mark in Ecology and Pollution.

15. Student learning outcome:

It is expected that after completion of this course the student will be able to understand and discuss many areas of Ecology specially biotic and abiotic factors of an ecosystems, major kinds of ecosystem, also the trophic level and energy flows through ecosystem, with the relationships in living communities. Elucidating the important biogeochemical cycles, population ecology and community dynamics. Concentrates on current issues in ecology that contributed with ozone depletion and global warming. Besides that, they will be able to understanding and reducing pollution and the atmospheric transport and dispersion of pollutants, strategies to assess and regulate pollution of water, contamination threat to soil, pollutants toxicity and environmental management. Students are expected to be very specific and exacting when answering questions concerning the specific topics in this course.

Developing a sufficient background for those students who wish to study more advanced Ecology and pollution topics and continue their future studies in this field.

16. Course Reading List and References:

- 1.Ecology, 2nd ed. 2011. By Michael L. Cain, William D. Bowman and Sally D. Hacker.

Sinauer Associates, Inc.
 2.Principles of environmental science: inquiry and applications, 6th ed. 2011. By William P. Cunningham and Mary A. Cunningham. McGraw-Hill Companies, Inc. USA.
 3.Understanding Environmental Pollution, 3rd ed. 2010. By Marquita K. Hill. Cambridge University Press.
 4.Ecology Experiments. 2010. By Pamela Walker and Elaine Wood. Infobase Publishing. USA.
 5.Environmental Science Experiments. 2010. By Pamela Walker and Elaine Wood. Infobase Publishing. USA.
 6.Environmental Chemistry: Microscale Laboratory Experiments. 2008. By Jorge G. Ibanez, Margarita Hernandez-Esparza, Carmen Doria-Serrano, Arturo Fregoso-Infante and Mono M. Singh. Springer Science + Business Media, LLC, USA.

| 17. The Topics: | | Lecturer's name |
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| Week 1 | What Is Ecology? Modern Definition; definition, overview and history. The basic concepts of ecology, Concepts of an Ecosystem, Subdivisions of ecology, levels of organization. | Dr. Abdulla H. Aziz |
| Week 2 | The Energy of Life, The First Law of Thermodynamics, The Second Law of Thermodynamics, Photosynthesis and Cellular Respiration, Habitat and Organism, Niche and Organism, Adaptation, Natural Resources Available in the Environment, Ecosystem; biotic and abiotic factors, Major kinds of ecosystems. | |
| Week 3 | What is Environment: What Keeps Us and Other Organisms Alive? Three Factors Sustain Life on Earth, What Happens to Solar Energy Reaching the Earth? Habitat and Organism: Niche and Organism: The Energy in Ecosystems; Trophic levels, energy flows, Ecological pyramids, important relationships in living communities, productivity | |
| Week 4 | Concepts of Ecosystem, Biotic Components, Abiotic Components, Food Chains, Food Web, Trophic Levels. | |
| Week 5 | The Six Most Abundant Elements of Life CHNOPS, Biogeochemical Cycles in Ecosystems, The Water Cycle. | |
| Week 6 | 2.Nitrogen Cycle, 3.Phosphorus Cycle, | |
| Week 7 | 4.The carbon cycle, 5. Oxygen Cycle, 6. Sulphur Cycle: The Sulfur Cycle Is Both Sedimentary and Gaseous: | |
| Week 8 | Global Climates and Biomes, The amount of solar energy reaching Earth varies with location, | |

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| Week 9 | Atmosphere Basics, The Troposphere, The Stratosphere, The Mesosphere, The Thermosphere (Ionosphere & Exosphere included), Mankind's Influence, | Dr. Abdulla H. Aziz |
| Week 10 | Global Atmospheric Circulation, Atmospheric circulation cells are established in regular latitudinal patterns, Atmospheric circulation cells create surface wind patterns, | |
| Week 11 | Ocean Circulation (Currents), Surface ocean currents move warm and cold water around the globe, Gyres, Upwelling, Deep ocean currents circulate ocean water over long time periods, The El Niño–Southern Oscillation is caused by a shift in ocean currents, | |
| Week 12 | Current Issues in Ecology; ozone, global climate change and pollution, global warming, | |
| 18. Practical Topics | | |
| The practical laboratories covered through a separate coursebook (Practical Ecology Coursebook) prepared Mr. Rebwar Kh. Shekha . | | Mr. Rebwar Kh. Shekha and Mrs. Sana K. Najmaddin |
| 19. Examinations: | | |
| 1. Compositional: | | |
| Q1/ How can you Define the following: 1. Ecology. 2. Food Chain. 3. Food Web. 4. Ecosystem. 5. Energy Flow. | | |
| Q2/ Explain the energy ecological pyramids. | | |
| Q3/ What are the major types of Natural ecosystems. | | |
| 2. True or false type of exams: | | |
| Q1/ Wetland is a type of Terrestrial ecosystem. | | |
| Wetland is a type of Terrestrial ecosystem. X, Wetland is a type of <u>Aquatic</u> ecosystem. | | |
| 3. Multiple choices: | | |
| 1. Food chain is the process of energy flow through..... A. ecological pyramids. B. Ecosystems. <u>C. Trophic Levels</u> . D. Aquatic & Terrestrial Habitat. | | |
| 21. Peer review | | |