

Course outline

Department: Biology

Module Title: Ecology and Environmental Biology

Course status: Compulsory

Course Title: Principle of Ecology

Course code: Biol2051

Credit hours: 3

Course Prerequisite: None

Target group: 2nd year, biology students

Semester II

Mode of delivery: Block I

1. Course description

The course deals with definition of ecological terms, description and discussion of ecological parameters at the level of population, community and ecosystems. It also covers topics on the effect of biotic and abiotic factors on organisms and their adaptive response to such challenges. The course deals with the difference biomes of the world and also the different ecosystems of Ethiopia. At the end of the theoretical part students will visit a selected natural environment and will engage themselves in a mini-project of field observation for few days that will reinforce understanding the concepts and principle they discussed in theory.

2. Course objectives

After completing the course the student will be able to:

- Describe ecological terminologies
- Describe environmental factors
- Explain communities and their structural characteristics
- Differentiate ecosystems and their functional dynamics (nutrient cycles, productivity, trophic levels)
- List Ethiopian Ecosystems.

3. Student workload

Students activity	Lecture	Field trip	Independent Reading	Total
Hours	48	30	57	135

4. Teaching Methods/Strategies:

- Lecture, field work, field report, presentation, individual or group project, independent reading, assignments.

5. Learning Resources/Input and Use of Instructional Technology:

- Chalkboard, chalk, marker, duster, laptop, flash disk, CD, LCD projector, pens, pencils and laboratory facilities and specimens in the laboratory, facilities for field activities.

6. Course contents

1. Introduction

- 1.1. Definition of Ecology
- 1.2. Branches of Ecology
- 1.3. methods used to study ecology

2. Introduction to Environmental factors

- 2.1. Classification of environmental factors
- 2.2. Density dependent and density independent factors
- 2.3. Biotic and abiotic environmental factors
- 2.4. Periodicity

Test I = 15%

3. Population Ecology

- 3.1. Definition
- 3.2. Population structure (sex and age ratios)

3.3. Population growth

3.4. Population regulation

3.5. Population interactions

3.6. Human population

Test II= 15%

4. Community Ecology (Definition)

4.1. Community structure (biological and physical)

4.2. Variations in community structure

4.3. Ecological succession

5. ECOSYSTEM ECOLOGY

5.1. Types of Ecosystems (Terrestrial and Aquatic)

5.2. Ecosystem productivity

5.3. Trophic structures and Energy flow in Ecosystems

5.4. Global environmental change

5.5. Biogeographic zones of the world

5.6. Biomes of the world

5.7. Energy flow and material recycling

5.8. Greenhouse effect

5.9. Global warming and climate change

6. Ecosystem of Ethiopia

Final exam = 50%

7. Mode of Assessment criteria:

✓ Tests	35%
✓ Field report and presentation.....	15%
✓ Final exam	50%
✓ Total	100%

8. Course policy

- ❖ Students are expected to actively participate in scientific learning process by doing the following course policies:

- ☞ Coming class on time
- ☞ Attend all class, meetings and be cooperative with others
- ☞ Be prepared to learn and actively participate in field works and class discussion regarding the topic that is being covered.
- ☞ Do all group works, and presentations on time
- ☞ All students are expected to complete their own work to the best of their ability and cheating is strictly forbidden.
- ☞ Do not miss quizzes, assignments, exams and field trip unless you are forced due to health problems etc.
- ☞ If you miss one of the exams due to illness, and have a valid medical note, take responsibility to ask and complete any make up work in the event of an absence.

9. Reference materials

- ✓ Begon M., Harper, J.L. and Townsend, C.R., (1990). *Ecology: Individuals, Populations and communities*. Blackwell. Scientific publication
- ✓ Odum, I.P. (1971). *Fundamental of Ecology*. 3rd ed. W.B. Saunders Company.
- ✓ Rana, S.V. (2005). *Essentials of Ecology and Environmental science*. 2nd ed. Prentice Hall of India, New Delhi.
- ✓ Sharma, P.D. (2012). *Ecology and Environment*. 11th ed. Prentice Hall of India, New Delhi.
- ✓ Smith, R.L. and Smith, T.M (1998). *Elements of ecology*. Addison Wesley, Longman. Inc, Canada.

Checked by:

Approved by:

Name: Gezahegn Getachew

Signature: _____

Name: Dr. Moges Kibret

Signature: _____