SCHOOL OF STEM SYLLABUS

TERM:

INSTRUCTOR:

COURSE CODE: BIO-208

OFFICE HOURS:

COURSE TITLE: Ecology

OFFICE LOCATION:

DAY(S) AND TIME(S):

EMAIL:

LOCATION:

PHONE:

COURSE PREREQUISITE: BIO-100 OR BIO-115, MAT-114

CREDITS: 4

COURSE DESCRIPTION:
In this course, students will understand the mechanisms governing the structure and function of ecological systems, particularly the relationship between organisms and the environment. Students will investigate key environment issues such as; global climate change, acid deposition, loss of biodiversity and genetically modified food.

STUDENT LEARNING OUTCOMES:

Upon completion of this course, student will be able to:

1. Define ecology and to test ecological theories
2. classify the different elements of life on earth, including water, temperature relations in ecosystems, macroclimate and microclimate.
3. discuss how climate influences vegetation, color of the ground, and organisms, the influence of temperature on plants, and microbial activity.
4. Explain water relations in ecosystems, the importance of water and its availability, water movement between soil and plants, relationship between different source of energy and nutrient
5. identify the principles of mate choice and sexual selection, the principles of cooperative breeders, analyze population genetics and natural selection, the Hardy-Weinberg model to identify evolutionary, discuss the evolution by natural selection.
6. explain how the physical environment limits the geographic distribution of species, met populations, population density, population dynamic, patterns of survival in a population, and correlation between age distribution and population history.
7. differentiate between geometric and exponential population growth, logistic population growth, and classify life history on earth, and how organism compete within an ecosystem, define niches, how competition influences niches of species.

8. describe complex interaction within a population, how exploitation and abundance occurs within an ecosystem, the dynamic relationship between prey and predator.
9. Explain how mutualism facilitates interactions of different species, plant and coral mutualism, why mutualism evolves when the benefits exceed the costs.
10. compare the factors that influence species abundance, explain why species diversity is higher in complex environment, and how species interaction determines community structure, feeding relationship in a community.
11. examine patterns of terrestrial primary production, aquatic primary production, and trophic levels, the nitrogen and carbon cycle within the environment, the rate of decomposition. plants and animals can modify nutrient cycling.
12. explain how community changes influences species diversity and composition, how ecosystems change during succession, and the principles of community stability

TEXTBOOK AND SUPPLEMENTAL MATERIALS:

TEXT: Manuel C. Molles Jr. Ecology: Concepts and Applications. McGraw Hill 6th Edition ISBN-13: 978-0073532493

LAB MANUAL: Vodopich S. Darrell: Ecology Laboratory Manual, McGraw Hill, ISBN: 978-0-07-338318-7

Required Supplemental Material/Information: Simbio Virtual Labs Software (For lab experiments)

GRADING POLICY:

Two Exams	20 points
Two Practical Exams	20 points
Final Comprehensive Exam	30 points
Midterm	20 points
Laboratory Reports/Assignments	10 points

Attendance, punctuality and participation are required. Students missing more than 2 classes may receive a failing grade. Cell phones should be turned off in the classroom.

Lab Format: Unless indicated otherwise, each laboratory exercise is set up for team of four-five students. Each student on the team is to participate in every aspect of the lab exercise. After each exercise, a formal lab report is handed in for grading. The lab reports are written (word processed) individually, not as a team, and handed in during the next lab session. You are required, by department policy, to follow all safety procedures. Each lab team is responsible for cleaning up their work area after every lab.

SAMPLE COURSE SCHEDULE:

Week #	**Lecture Topic**	**Lab Topic**
1	Overview of Ecology	Lab Safety Rules Scientific Investigation
2	Life on Earth	SimBio Virtual Lab "The Barnacle Zone".
3	Life in Water	SimBio Virtual Lab "Nutrient Pollution".
4	Population Genetics and Natural Selection	SimBio Virtual Lab "Darwinian Snails". (software)
5	Temperature relations in ecosystem	5 written assignments: Climate Influence on Organisms or Temperature and Animal Performance
6	Water, Energy and Nutrient Relations in Ecosystems	SimBio Virtual Lab "Osmosis"
7	Social Relations	SimBio Virtual Lab "Who Rules the Rock".
8	Population distribution, abundance and dynamics MIDTERM	Lab Exam I
9	Population Growth and History of Life on Earth	SimBio Virtual Lab "Rabbits and Their Habitats
10	Mutualism	soil testing and identify organism that can live in the different habitats.
11	Species abundance and diversity	Intermediate Disturance Hypothesis

12	Species Interactions and Community Structure	Keystone Predators".
13	Primary Production & Energy Flow	"Growing Phytoplankton
14	Nutrient Cycling, Retention, Succession and Stability	**Lab Exam II**
15	**Final Exam**	

HCCC POLICIES, STATEMENTS, AND SERVICES:
https://www.hccc.edu/administration/academic-affairs/syllabus-addendum.html