DATE OF LAST REVIEW: 02/2013

CIP CODE: 24.0101

SEMESTER: DEPARTMENTAL SYLLABUS

COURSE TITLE: Environmental Science Lab

COURSE NUMBER: BIOL-0132

CREDIT HOURS: 2

INSTRUCTOR: DEPARTMENTAL SYLLABUS

OFFICE LOCATION: DEPARTMENTAL SYLLABUS

OFFICE HOURS: DEPARTMENTAL SYLLABUS

TELEPHONE: DEPARTMENTAL SYLLABUS

EMAIL: DEPARTMENTAL SYLLABUS

KCKCC-issued email accounts are the official means for electronically communicating with our students.

PREREQUISITE(S): BIOL0131 should be taken concurrently

REQUIRED TEXT AND MATERIALS: Please check with the KCKCC bookstore, http://www.kckccbookstore.com/, for the required texts for your particular class.

COURSE DESCRIPTION: This course introduces the interrelationships within and between the Biotic and Abiotic. The student will get hands on experience collecting, analyzing and interpreting environmental data.

METHOD OF INSTRUCTION: A variety of instructional methods may be used depending on content area. These include but are not limited to: lecture, multimedia, cooperative/collaborative learning, labs and demonstrations, projects and presentations, speeches, debates, panels, conferencing, performances, and learning experiences outside the classroom. Methodology will be selected to best meet student needs.

COURSE OUTLINE: (the instructor may add and/or delete material as time permits.)

I. Basic Principles of the earth’s systems
   A. Energy
      1. Energy: forms and quality
      2. Energy: units and measurement
      3. Energy: conversions
   B. Matter cycling
      1. Water
      2. Carbon
      3. Nitrogen
      4. Phosphorus
C. Geology
   1. Geologic time scale
   2. The dynamic earth
      a. plate tectonics
      b. volcanism
      c. earthquakes
      d. the rock cycle
      e. soil formation

D. The Atmosphere
   1. Composition and Structure
   2. Meteorology

E. The Biosphere
   1. Organisms – adaptation
   2. Populations and Communities
      a. exponential growth
      b. carrying capacity
   3. Ecosystems in flux
      a. biomass
      b. energy transfer
      c. succession

II. Population Dynamics
A. Predator Prey relationships
B. Exponential Growth
C. Limiting factors
D. Carrying Capacity

III. Renewable and Nonrenewable Resources: Distribution, Use and Degradation
A. Water
   1. Hydroponics
   2. Aquaculture
B. Minerals
C. Soils
D. Biological
E. Energy
F. Land

IV. Environmental Quality
A. Air
   1. Air pollution
   2. Acid Rain
   3. Ozone depletion
   4. Greenhouse effect
   5. Noise pollution
B. Water
   1. Water pollution
   2. Thermopollution
   3. Fertilizer runoff
   4. Pesticide runoff
   5. Acidification
C. Soil
   1. Water logging
   2. Salinization
   3. Pesticides
   4. Fertilization
D. Tolerance levels and Toxicology

V. Global Changes and Consequences
   A. Ozone depletion and Ultraviolet light levels
   B. Greenhouse gases and global warming

EXPECTED LEARNER OUTCOMES:

A. The learner will acquaint the student with the methods of science, especially as they relate to environmental science.

B. The learner will encourage an understanding of the complexities and interrelationships living organism have with each other and with their environment.

C. The learner will promote the value of critical thinking both during and after the class.

COURSE COMPETENCIES: (Based upon material covered, which is determined by the instructor taking into account time, opportunity and current events in environmental science)

The learner will encourage an understanding of the complexities and interrelationships living organism have with each other and with their environment.

The learner will acquaint the student with the methods of science, especially as they relate to environmental science.

1. The learner will be able to make a measurement of Abiotic factors.
2. The learner will be able to make a collection of qualitative and quantitative data.
3. The learner will be able to propose and support hypotheses.
4. The learner will be able to interpret data.
5. The learner will be able to make a comparison of experimental results to a control.
6. The learner will be able to graph data.
7. The learner will be able to describe the theory of plate tectonics and its relationship to earthquakes and volcanic activity.
8. The learner will be able to identify the general effects of volcanic eruptions and their relationship to weather patterns.
9. The learner will be able to describe the effects of mechanical and chemical weathering of rock.
10. The learner will be able to relate the physical and chemical processes involved in rock weathering to soil formation.
11. The learner will be able to graph and interpret data obtained from the growth of a population.
12. The learner will be able to calculate the doubling time of a population.
13. The learner will be able to define carrying capacity in terms of limiting factors.
14. The learner will be able to identify the horizons in a soil profile.
15. The learner will be able to describe soil characteristics.
16. The learner will be able to identify the chemical composition of soil.
17. The learner will be able to analyze energy consumption data and calculate monthly and/or annual costs.
18. The learner will be able to collect and measure airborne particulate matter.
19. The learner will be able to identify major types of air pollution and their sources.
20. The learner will be able to measure the effects of various toxic materials on a laboratory population.
21. The learner will be able to determine the LD50 for various toxic materials on a laboratory population.
22. The learner will be able to measure and analyze coliform levels and dissolved oxygen in a water sample.

The learner will promote the value of critical thinking both during and after the class.
23. The learner will be able to construct a model that demonstrates the greenhouse effect.
24. The learner will be able to explain the greenhouse effect.
25. The learner will be able to identify the major greenhouse gasses and their sources.
26. The learner will be able to collect and measure the pH of water samples from various sources and compile pH data over an extended period of time.
27. The learner will be able to identify sources of pollutants that can affect pH.
28. The learner will be able to measure the growth of irradiated and unirradiated seeds.
29. The learner will be able to graph experimental and control data as a function of time and radiation dose.
30. The learner will be able to analyze the effects of different amounts of radiation on growth parameters (i.e. Root and shoot length, germination rates).

ASSESSMENT OF LEARNER OUTCOMES:
Student progress is evaluated by means that include, but are not limited to, exams, written assignments, and class participation.

SPECIAL NOTES:
This syllabus is subject to change at the discretion of the instructor. Material included is intended to provide an outline of the course and rules that the instructor will adhere to in evaluating the student’s progress. However, this syllabus is not intended to be a legal contract. Questions regarding the syllabus are welcome any time.

Kansas City Kansas Community College is committed to an appreciation of diversity with respect for the differences among the diverse groups comprising our students, faculty, and staff that is free of bigotry and discrimination. Kansas City Kansas Community College is committed to providing a multicultural education and environment that reflects and respects diversity and that seeks to increase understanding.

Kansas City Kansas Community College offers equal educational opportunity to all students as well as serving as an equal opportunity employer for all personnel. Various laws, including Title IX of the Educational Amendments of 1972, require the college’s policy on non-discrimination be administered without regard to race, color, age, sex, religion, national origin, physical handicap, or veteran status and that such policy be made known.

Kansas City Kansas Community College complies with the Americans with Disabilities Act. If you need accommodations due to a documented disability, please contact the Director of the Academic Resource Center at 913-288-7670.