Honolulu Community College
General Education – DIVERSIFICATION DESIGNATION
Certification and Recertification
Application Form
Spring 2012

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COURSE ALPHA and NUMBER: SCI 101

COURSE TITLE: Environmental Science

ESTIMATED NUMBER OF SECTIONS:
   Fall: 1
   Spring: 1

APPLICATION IS FOR:
   ☑ Existing Course
   ☑ Re-certification. Date of last certification:

DIVERSIFICATION AREA DESIGNATION SOUGHT:
   ☐ DA (Arts)
   ☑ DB (Biological Sciences)
   ☐ DH (Humanities)
   ☐ DL (Literature and Language)
   ☐ DP (Physical Sciences)
   ☐ DS (Social Sciences)
   ☐ DY (Laboratory)

What percentage of the CONTENT of this course focuses on this diversification area? 95

What percentage of CLASS MEETINGS focuses on this diversification area? 95
1. **Hallmarks and SLOs.** Please explain how course-specific SLOs align with the diversification area's hallmarks.

**DB. 1 Uses terminology of the biological sciences:**

- SLO 1. Learn about ecological principles, theory of population dynamics and terminology used in the study of ecosystem and food-chain concept.
- SLO 2. Understand photosynthesis and its importance in sustaining life on earth.
- SLO 4. Learn about demography and strategies of population growth.
- SLO 8. Study of biome development and biodiversity.

Like other biological science courses, this course also will introduce students to various terminology used in understanding ecosystem and population dynamics theories (SLOs 1 & 4). Terminology and vocabulary used to understand synthesis of food, functions of various components of food in a living body are explained in SLO 2. Terms such as natality, mortality, life expectancy, carrying capacity and environmental resistance are covered in SLO 4. Terms such as competition. Symbiosis, biomes and ecological succession are introduced through SLO 8.

**DB 2. involves knowledge and theories relating to processes in the biological sciences:**

- SLO 1. Learn about ecological principles, theory of population dynamics and terminology used in the study of ecosystem and food-chain concept.
- SLO 2. Understand photosynthesis and its importance in sustaining life on earth.
- SLO 5. Analyze existing sources of pollution and their impacts on the environment.
- SLO 6. Understand methods of curbing pollution problems
- SLO 7. Examine probable health hazards associated with chemicals introduced to the environment by human activities.
- SLO 8. Study biome development and biodiversity.

Knowledge of how our biosphere works is an important criterion necessary to understand human impact on the environment and its consequences. SLOs 1, 2 and 8 introduce student to biological processes such as photosynthesis, biological community and biome development. Influence of temperature and precipitation are critical criteria that influence biome development (SLO 8). In order to evaluate impacts of pollution in the environment, students are required to learn about the sources and types of pollutants and how they affect the physiology of organisms (SLO 5 and 7). Application of modern technology in curbing pollution problems are introduced in SLO 6.

**DB. 3 Demonstrates inquiry that is guided by observation/ experiment and reasoning and mathematics:**
SLO 1. Learn about ecological principles, theory of population dynamics and terminology used in the study of ecosystem and food-chain concept.

SLO 2. Understand photosynthesis and its importance in sustaining life on earth.

SLO 3. Develop an awareness of how over-population, urbanization and technological advancements have affected depletion of our finite resources and production of wastes and pollutants that deteriorate our environment at an alarming rate.

SLO 4. Learn about demography and strategies of population growth.

SLO 7. Examine probable health hazards associated with chemicals introduced to the environment by human activities.

Classroom demonstrations and documentation of biological processes through audio-visual media facilitate students to be able to observe and derive at their own conclusions on the importance of study of environmental science. Demonstration of food-chain concepts and trophic levels leave students with reasoning for why the earth's resources should be managed for sustainability. (SLOs 1 and 2). Understanding of population dynamics (density, growth and distribution) requires application of mathematics to construct and interpret different population growth curves (SLO 4). SLOs 3 and 7 will enable students to apply concepts learned in the class to relate to what is happening in the real world and make them aware of long term consequences of human interaction with the environment.

2. **Assessment strategies.** Explain assessment strategies you have used (or plan to use) to measure the degree to which students exit the course with the course-specific SLOs. If there are multiple sections of the course taught by different instructors, please discuss how assessment is (or will be) carried out across instructors.

Because of the applied nature of this course, there are many opportunities for students to relate what they learn in the class to the current problems of the world (population explosion, pollution and poverty). Therefore, the instructor will be able to evaluate the effectiveness of instruction from the feedback from students. Group discussions in the class on current world affairs relating to environment will be an excellent tool for the instructor to document the degree of success in facilitating all SLOs. Periodic short quizzes, two midterms and the final exit exams will provide the instructor mechanisms for evaluating student performance of the course and accomplishment of all SLOs. Students are encouraged to attend lecture sessions in an effort to improve student retention and completion. Prescribed text book and lecture notes are expected to enhance student learning ability. Use of audio-visual materials in the class assist students to get a comprehensive sense of what the theory is conveying. Questions in the exams are aimed at measuring the effectiveness of course-specific SLOs. Students will be given a chance to go over the exam results in the class in order to identify their mistakes and shortcomings in the exams. This activity strengthens student's understanding of the course content and SLOs. Student evaluations give feedback about the course and instructor's performance in meeting the expected SLOs. There is only one instructor teaching this course each semester.
3. **Assessment of assessment.** How have you used (or plan to use) the assessment findings to modify or improve this course? If there are multiple sections of the course taught by different instructors, please discuss how review of assessment results is (or will be) carried out across instructors.

Because of the dynamic nature of this course, the instructor will have to do periodic updating of the teaching tools and modify statistical data used in instruction (for example: change in world population, advancement in environmental monitoring devices and type and degree of pollution problems of the world etc). Instructor will incorporate feedback received from students with regard to course content and methodology of instruction.
DIVERSIFICATION BOARD DECISION:

☑ Approved

Re-Certification Due: 2018

☐ Not approved

If not approved, reasons for disapproval:

Diversification Board Chair Signature: [signature]

Date: 1/10/13
Course Syllabus

Course Title: Environmental Science

Course Number: SCI 101

Credits: 3

Prerequisite: None

Time: 11:30 – 12:45 PM (T & Th)

Course Description:

This course will introduce students to principles of ecology and ecosystem dynamics in order to understand how our biosphere works and how the environmental pollution deteriorates the delicate balance of nature. A survey will be made on all current pollution problems resulting from over-population, urbanization and technology that use our finite natural energy resources and produce excessive amount of wastes. The course will also analyze current national and international policies developed to curb all environmental pollution problems.

This course will satisfy the diversification requirement in Biological Sciences (DB) (Group 1 of Natural Science Requirement)

Course Content:

Contents of the course are divided into four parts: Part 1 - Principles for understanding our environment; Part 2 - Human and the environment; Part 3 - Understanding and managing living systems and Part 4 - Physical Resources and Environmental systems. Each part will be covered within 25% of the total hours allocated for the course.

Topics covered in Part 1 include: Understanding our environment (introduction, definition and related fields); Environmental Philosophy, ethics and science; Matter, energy and life (atoms and molecules. Cell structure and function, photosynthesis and food chain dynamics and chemical cycles in nature); Biological communities and species interactions (ecosystems, biological communities species abundance and diversity); Biomes and population biology (definition and types of biomes)
Topics covered in Part 2 include: Human population (human demography, types of population growth and environmental resistance); Environmental health and toxicology (types of environmental health hazards, toxic chemicals, Acute and chronic toxicity); Food and agriculture and Pest control.

Topics covered in Part 3 include: Biodiversity; Land use (forests and grasslands); Preserving and restoring nature.

Topics covered in Part 4 include: Geology and earth resources; Air, weather and climate; Air pollution; Water use and management and water pollution.

**Student learning outcomes:**

1. Learn about ecological principles, theory of population dynamics and terminology used in the study of ecosystem and food-chain concept.
2. Understand photosynthesis and its importance in sustaining life on earth.
3. Develop an awareness of how over-population, urbanization and technological advancements have affected depletion of our finite resources and production of wastes and pollutants that deteriorate our environment at an alarming rate.
4. Learn about demography and strategies of population growth.
5. Analyze existing sources of pollution and their impacts on the environment.
6. Understand methods of curbing pollution problems
7. Examine probable health hazards associated with chemicals introduced to the environment by human activities.
8. Study biome development and biodiversity


**Methods of Instruction:**

Three hours of lecture per week. Audio-visual aids, handouts and sets of review questions will be used in support of classroom instruction.

**Methods of Evaluation:**

Grades will be determined on the basis of student performance in three exams: two midterms and one final. Each exam will be worth of 100 points. Letter
grades are assigned on the basis of the average score of the three exams: 90-100 = A; 75-89 = B; 60-74 = C; 40-59 = D; less than 40 = F.

If a student misses any of the three exams, the score for that exam will be zero. Therefore, it is the responsibility of the student to take exams on the scheduled dates and times. An excuse will be given only for compelling reasons and require written documentation such as a letter from your physician.

November 4, 2012