

Clackamas Community College
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Section #1 General Course Information

Department:Sciences

Submitter

First Name: Richard

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Course Prefix and Number:ESR - 172

Credits:4

Contact hours

Lecture (# of hours): 33

Lec/lab (# of hours):

Lab (# of hours): 33

Total course hours: 66

For each credit, the student will be expected to spend, on average, 3 hours per week in combination of in-class and out-of-class activity.

Course Title:Environmental Science

Course Description:

Introduction to planning of parks and preserves, the scientific method, energy principles, fossil fuel recovery and use, renewable energy sources, nuclear energy, environmental toxicology, air pollution, indoor air pollution, ozone depletion, and climate change.

Type of Course:Lower Division Collegiate

Is this class challengeable?

No

Can this course be repeated for credit in a degree?

No

Is general education certification being sought at this time?

Yes

Check which General Education requirement:

✓ Science & Computer Science

Is this course part of an AAS or related certificate of completion?

No

Are there prerequisites to this course?

No

Are there corequisites to this course?

No

Are there any requirements or recommendations for students taken this course?

Yes

Recommendations: Pass MTH-060 with a C or better or placement in MTH-065; pass RD-090 or placement in RD-115; pass WR-095 or placement in WR-121

Requirements: None

Are there similar courses existing in other programs or disciplines at CCC?

No

Will this class use library resources?

No

Is there any other potential impact on another department?

No

Does this course belong on the Related Instruction list?

No

GRADING METHOD:

A-F or Pass/No Pass

Audit: Yes

When do you plan to offer this course?

✓ **Winter**

Is this course equivalent to another?

If yes, they must have the same description and outcomes.

No

Will this course appear in the college catalog?

Yes

Will this course appear in the schedule?

Yes

Student Learning Outcomes:

Upon successful completion of this course, students should be able to:

1. explain how to use the principles of island biogeography, the edge effect, and migration corridors to plan parks and preserves; (SC1)
 2. describe the scientific method, (SC2)
 3. describe the major categories of pollutants and explain the concept of dose response, (SC1) (SC2)
 4. explain the laws of thermodynamics, describe forms and units of energy, and describe methods for making energy consumption and development sustainable; (SC1) (SC2)
 5. explain how fossil fuels form, describe the geographic distribution and availability of fossil fuels, and describe the environmental effects of the recovery and use of fossil fuels; (SC1)
 6. describe the major renewable energy sources and evaluate their environmental costs and benefits; (SC1)(SC2)
 7. describe atomic structure, nuclear fission, radiation, and the environmental and human health effects of radiation, and summarize the factors that influence public opinion concerning nuclear power, (SC1) (SC2) (SC3)
 8. describe the environmental effects of groundwater use, wetland loss, and dams; summarize the values of wetlands for people; and describe methods of making water use sustainable; (SC1) (SC3)
 9. identify the major categories of water pollutants and their environmental effects, and explain how water pollution can be controlled and treated; (SC1)
 10. explain the causes of major changes in climate that have occurred throughout the geologic history of Earth, describe methods of evaluating past climate, explain the greenhouse effect and the anthropogenic processes that contribute to global warming, summarize the potential environmental and human health affects of global warming, and describe the kinds of adjustments people can make to global warming; (SC1) (SC3)
 11. describe the major sources and effects of the human-produced air pollutants, summarize methods of controlling air pollutants, and explain the purpose of air quality standards. (SC2)
-

**AAOT/ASOT GENERAL EDUCATION OUTCOMES
COURSE OUTLINE MAPPING CHART**

Mark outcomes addressed by the course:

- Mark "C" if this course completely addresses the outcome. Students who successfully complete this course are likely to have attained this learning outcome.
- Mark "S" if this course substantially addresses the outcome. More than one course is required for the outcome to be completely addressed. Students who successfully complete all of the required courses are likely to have attained this learning outcome.
- Mark "P" if this course partially addresses the outcome. Students will have been exposed to the outcome as part of the class, but the class is not a primary means for attaining the outcome and assessment for general education purposes may not be necessary.

As a result of completing the AAOT/ASOT general education requirements, students will be able to:

WR: Writing Outcomes

1. Read actively, think critically, and write purposefully and capably for academic and, in some cases, professional audiences.
2. Locate, evaluate, and ethically utilize information to communicate effectively.
3. Demonstrate appropriate reasoning in response to complex issues.

SP: Speech/Oral Communication Outcomes

1. Engage in ethical communication processes that accomplish goals.
2. Respond to the needs of diverse audiences and contexts.
3. Build and manage relationships.

MA: Mathematics Outcomes:

1. Use appropriate mathematics to solve problems.
2. Recognize which mathematical concepts are applicable to a scenario, apply appropriate mathematics and technology in its analysis, and then accurately interpret, validate, and communicate the results.

AL: Arts and Letters Outcomes

1. Interpret and engage in the Arts & Letters, making use of the creative process to enrich the quality of life.
2. Critically analyze values and ethics within range of human experience and expression to engage more fully in local and global issues.

SS: Social Science Outcomes

1. Apply analytical skills to social phenomena in order to understand human behavior.
2. Apply knowledge and experience to foster personal growth and better appreciate the diverse social world in which we live.

SC: Science or Computer Science Outcomes

- S** 1. Gather, comprehend, and communicate scientific and technical information in order to explore ideas, models, and solutions and generate further questions.
- S** 2. Apply scientific and technical modes of inquiry, individually, and collaboratively, to critically examine the influence of scientific and technical knowledge on human society and the environment.

- S** 3. Assess the strengths and weaknesses of scientific studies and critically examine the influence of scientific and technical knowledge on human society and the environment.

CL: Cultural Literacy Outcome

1. Identify and analyze complex practices, values, and beliefs and the culturally and historically defined meanings of difference.

Outcomes Assessment Strategies:

:

Major Topic Outline:

1. Planning of parks and preserves.
 - a. Principles of island biogeography.
 - b. The edge effect.
 - c. Migration corridors.
2. The scientific method.
3. Pollution and toxicology.
 - a. Sources of pollutants.
 - b. Heavy metals and persistent organic pollutants.
 - c. Thermal pollution.
 - d. Noise pollution.
 - e. Toxic dose responses to pollutants.
4. Energy principles, patterns of energy consumption, and energy policy and management.
 - a. Forms of energy.
 - b. The laws of thermodynamics.
 - c. Units of energy.
 - d. Conservation of energy, increased energy efficiency, and cogeneration.
 - e. Hard and soft paths of energy policy.
 - f. Integrated energy management.
5. Fossil fuels and the environment.
 - a. Formation, distribution, reserves, and consumption of major fossil fuels.
 - b. Environmental effects of the recovery and use of fossil fuels.
6. Renewable energy and the environment.
 - a. Availability of renewable energy sources.
 - b. Solar energy systems.
 - c. Fuel cells and hydrogen fuel.
 - d. Hydropower.
 - e. Wind power.
 - f. Biomass energy.
 - g. Geothermal energy.
 - h. Environmental costs and benefits of renewable energy sources.
7. Nuclear energy and the environment.
 - a. Atomic structure and isotopes.
 - b. Energy from nuclear fission.
 - c. Nuclear radiation, radioactive decay, and the half life of a radioisotope.
 - d. Kinds of nuclear radiation.
 - e. Units of radiation.
 - f. Health effects of radiation.
 - g. Nuclear fallout.

- h. Nuclear power plant accidents.
- i. Radioactive waste management.
- 8. Water supply, use, and management.
 - a. Groundwater and the problems of overdraft of groundwater.
 - b. Off-stream, consumptive, and in-stream uses of river water.
 - c. Major uses and conservation of water.
 - d. The natural service functions and values of wetlands.
 - e. The environmental effects of dams.
 - f. Floodplains and the environmental benefits of flooding.
- 9. Water pollution and treatment of water pollution.
 - a. Concept of thresholds for water pollutants.
 - b. Causes and environmental effects of BOD (biochemical oxygen demand).
 - c. Important waterborne diseases and fecal coliform bacteria as an indicator of the disease potential of water.
 - d. Causes and effects of cultural eutrophication.
 - e. Sediment pollution and environmental effects of sedimentation.
 - f. Point and nonpoint sources of surface water pollution.
- 10. Climate change and global warming.
 - a. The difference between weather and climate.
 - b. Long-term global climate change.
 - c. Techniques used to evaluate past climate.
 - d. Global warming and the greenhouse effect.
 - e. The major anthropogenic greenhouse gases.
 - f. Polar amplification of global warming.
 - g. Potential physical and biological effects of global warming.
 - h. Adjustments to global warming.
- 11. Air pollution and control of air pollution.
 - a. Sources and effects of criteria air pollutants.
 - b. Global dimming.
 - c. Causes and effects of acid rain.
 - d. Formation of photochemical smog.
 - e. Technologies for controlling air pollution.
 - f. The purpose of air quality standards.

Does the content of this class relate to job skills in any of the following areas:

- | | |
|--------------------------------------|-----------|
| 1. Increased energy efficiency | No |
| 2. Produce renewable energy | No |
| 3. Prevent environmental degradation | No |
| 4. Clean up natural environment | No |
| 5. Supports green services | No |

Percent of course:0%

Section #2 Course Transferability

Concern over students taking many courses that do not have a high transfer value has led to increasing attention to the transferability of LDC courses. The state currently requires us to certify that at least one OUS school will accept a new LDC course in transfer. Faculty should communicate with colleagues at one or more OUS schools to ascertain how the course will transfer by answering these questions.

1. Is there an equivalent lower division course at the University?
2. Will a department accept the course for its major or minor requirements?
3. Will the course be accepted as part of the University's distribution requirements?

If a course transfers as an elective only, it may still be accepted or approved as an LDC course, depending on the nature of the course, though it will likely not be eligible for Gen Ed status.

Which OUS schools will the course transfer to? (Check all that apply)

Identify comparable course(s) at OUS school(s)

How does it transfer? (Check all that apply)

:

Provide evidence of transferability: (minimum one, more preferred)

First term to be offered:

Next available term after approval

:
