

Course Outline

Environmental Concepts & Issues

SC249

Course Title

Dept. and Course No.

I. Course Description:

This course introduces students to environmental concepts and issues at the local and global levels. The course includes analytical reading and reviewing scientific literatures on a range of local environmental issues and analyzing reliability of mainstream media such as newspaper articles. Online lectures and assignments give overviews of the major ecosystems on Pacific islands, their values, and environmental threats in the 21st century including global climate change, biodiversity, land use, waste management, and sustainability of resources. Students will be required to undertake a research project and write a scientific research paper using the present MLA writing guidelines.

II. Semester Credits: 4

III. Contact Hours Per Week:	<u>3</u>	<u>3</u>	<u>6</u>
	Lec	Lab	Total
Total Course Hours:	<u>98</u>		

IV. Prerequisites: ENII2

V. STUDENT LEARNING OUTCOMES: At the end of the semester the student, with 65% accuracy, will be able to:

1. Classify and give examples of Pacific Islands based on their geological formation
2. Summarize Darwin's hypothesis of atoll formation
3. Briefly describe how scientists collect data and develop theories, models, and laws about how nature works.
4. Describe the culture of science and apply the critical thinking in assessing environmental issues
5. Describe the physical conditions of island environment: geological history of islands, topography, weather and anomalies, climate
6. Explain how these physical conditions influence structure and make-up of island communities
7. Describe factors that define habitats on land and in water, some of the ways organisms responds to these factors, and how these factors change along gradients that define zonation
8. Explain what why species diversity matters and how it arises.
9. Explain what biodiversity is and why it is

VI. COURSE CONTENT:

- A. Islands, People, and Knowledge
 1. Pacific Islands Environments & People
 2. Island Formation
 3. Scientific Method
 4. Culture of Science
- B. The Physical Environment
 1. Geology & Geography
 2. Climate
 3. El Nino/Southern Oscillation
 4. Typhoons
- C. Habitats
 1. Habitats
 2. Abiotic Factors in Terrestrial and Aquatic Habitats
 3. Zonation
- D. Diversity of Life
 1. Diversity of Species
 2. Biodiversity

- important.
10. Explain the importance of classification and the discipline of phylogeny
 11. Explain how Earth's life changes over time and how endemic species arise

12. Describe the different ways that individual species reach isolated islands and establish populations, and how these populations grow
13. Explain symbiotic associations in terrestrial and marine communities, and processes of succession through which communities change over time.

14. Discuss trophic levels, productivity, and nutrient cycles, and examine some simple ecosystems
15. Survey a major terrestrial and/or aquatic ecosystem

16. Describe characteristics of tropical soil, grassland, savanna, and forest ecosystems and the services they provide
17. Explain how human activities have affected these ecosystems and provide recommendations for conservation and sustainability of these ecosystems as valuable resources

18. Compare and contrast the different types of freshwater ecosystems and give examples (local and regional).
19. Describe the characteristic of mangrove ecosystems, their ecosystem services, threats, and sustainable management plans for these unique ecosystems
20. Summarize the different global and local (state & national) regulations that help protect and preserve different freshwater ecosystems

21. Discuss the primary ecosystem services provided by coral reefs.
22. Discuss impacts of human interactions with coral reefs and open ocean ecosystems
23. Describe local and international efforts to protect and sustain coral reefs and open ocean ecosystems and the natural resources from these ecosystems

24. Discuss the impacts of introduced species to island ecosystems and methods of dealing with them
25. Identify and describe factors that lead to species becoming extinct or endangered

3. Classification & Systematics
4. Evolution of Endemic Species on Islands

E. Island Populations and Communities

1. How Species Get to Islands
2. Population Growth & Estimation
3. Symbiosis
4. Succession

F. Ecosystems & Biomes

1. Ecosystem Structure
2. Global Biomes

G. Terrestrial Ecosystems

1. Soil, Erosion, and Conservation
2. Grassland & Savanna
3. Forest Ecosystems
4. Forest Ecosystem Services & Conservation

H. Freshwater Ecosystems

1. Freshwater Ecosystems and Communities
2. Mangrove Ecosystems
3. Wetlands' Uses & Regulations

I. Marine Ecosystems

1. Coral Reef
2. Coral Reef Ecosystem Services, Threats, and Conservation
3. Open Ocean Ecosystems

J. Ecosystem Changes

1. Introduced Species and Their Consequences
2. Management of Invasive Species
3. Endangered Species and Habitats

26. Discuss mass extinction—present and past—and explain why it is important to sustain biodiversity
27. Explain how speciation, extinction, and human activities affect biodiversity
28. Discuss the impacts of pollution—sewage and solid waste disposal—on environmental and human health, and present sustainable solutions to these problems

29. Describe the basics of greenhouse effect, examine evidence of global warming/climate change, and discuss consequences for Pacific Island societies and the ecosystems that the island people depend on.
30. Explain how climate change affect the nature and location of biomes

31. Discuss management of renewable and nonrenewable natural resources on Pacific Islands, including ecosystems themselves, taking into consideration social and political context in which management decisions are made.
32. Explain what it means to use resources sustainably.

33. Analyze scientific and mainstream media releases concerning local and regional environmental issues and write an issue paper following the present MLA writing guidelines discussing the following: cause-and-effect of some of the major local and/or regional environmental issues; short- and long-term impacts of local environmental changes on the regional and global communities; critically assess and evaluate initiatives designed to mitigate issue; and propose sustainable solutions to local &/or regional environmental issue by applying relevant environmental principles

34. Actively seek out, process, and analyze environmental information by reading the textbook, popular, and scientific publications on an environmental issue of choice approved by instructor
35. Analyze and discuss scientific information to construct an informed position on a

4. Ecosystem Changes Caused by Pollution

K. Climate Change

1. Introduction
2. The Greenhouse Effect
3. Global Climate Change, Sea Levels, Ocean Acidification
4. Risks for Pacific Islands from Global Climate Change
5. Minimizing Change, Preparing for Change

L. Ecosystem Management & Sustainability

1. Renewable & Nonrenewable Resources
2. Living Wild Resources
3. Agricultural Resources
4. Water
5. Energy & Metals
6. Ecosystem Services
7. Risk Assessment
8. Knowledge, Values, & Economics

M. Literature reviews focused on the following local, regional, and global environmental issues in:

1. Tourism and environment
2. Marine environment
3. Traditional and modern natural resource management
4. Business and environment
5. Environmental law
6. Women and environment
7. Environmental impact assessment and major projects
8. Waste management
9. Planning and the environment
10. Social and environmental issues

N. Research Project

particular environmental issue with a general theme of raising awareness of the issue

36. Examine multiple perspectives on a particular environmental topic by collaborating in the research process and discussing findings
37. Engage in community activities to experience possible solutions to posed problems by interviewing local experts and those directly and indirectly affected by the environmental issue; investigate state and national policies and regulations concerning environmental issue

38. Present research project at a community meeting, campus lecture open to public, or to other PCC students

O. Environmental issue public awareness presentation

VII. MATERIALS AND EQUIPMENT:

- A. Internet access
- B. Television
- C. DVD/VCR player
- D. LCD projector
- E. Laptop and printer
- F. Selected videos and DVDs from the PCC Library media collection

VIII. TEXTS AND REFERENCES:

- A. Required textbook for all students enrolled in this course:

Lobban, Christopher, Maria Schefter, and Frank Camacho, and John Jocson. Tropical Pacific Island Environments, 2nd Edition. Honolulu, Hawaii USA: Bess Press, 2014

IX. METHOD OF INSTRUCTION:

- A. Traditional classroom and lab lectures and demonstrations
- B. Use of supplemental audio-visuals (DVDs and VCR tapes)
- C. Instructor-made supplemental readings and reinforcement exercises
- D. Reinforcement Activities
- E. Field Trips
- F. Web search
- G. Symposium

X. METHOD OF EVALUATION:

- A. The raw points will be weighted based on the following scale:

Written research report	40%
Oral presentation of research	20%
Issue Papers (Total of 4)	20%
Assignments & Quizzes	10%
<u>Tests</u>	<u>10%</u>
TOTAL	100%

B. At the end of the semester all points will be totaled and properly weighted and final grades will correspond to the following conversions:

90-100%	A
80-89%	B
70-79%	C
65-69%	D
00-64%	F

Task List Sheet

SC249 Environmental Concepts & Issues
Course No. & Title

Credits: 3 1 48
Lec. Lab Total Lab Hrs.

TASKS

HOURS

1. SLO # 33: Provide students with an understanding of local and regional environmental issues as they affect Palau and the region 12
 - a. Students use critical thinking skills to determine reliability and accuracy of information from the media such as article clippings from newspaper and magazines, documentary videos, and TV news and reports
2. SLO # 33: Provide guidelines for writing an environmental issue paper 3
3. SLO # 33: Provide MLA writing guidelines for writing a formal science research paper 3
4. SLO # 34-37: Student investigates a local environmental issue of personal and/or professional interest. 18
 - a. Write a thesis statement and statement of purpose for chosen environmental issue to for approval by the instructor before student initiates research
 - b. Conduct formal academic research and submit annotated bibliography for at least five references
 - c. Involve the community in your project by interviewing local expert or experts on the issue.
 - d. Put together a formal scientific research paper on the chosen topic following the most current guidelines for MLA writing style
5. SLO #38: Student presents environmental issue of interest with the purpose of raising awareness of the issue in the local community and/or PCC campus 12
 - a. Present research project to other students and/or community members
 - b. Peer evaluation of presentations

Palau Community College
SC249 ENVIRONMENTAL CONCEPTS & ISSUES
Course Learning Outcomes

During the course experience, the **course learning outcomes (CLOs)** will be assessed through the use of signature assignments. A rating scale will be used to determine the students' proficiency level of each CLO using specifically aligned assignments. The numerical ratings of 4, 3, 2, and 1 are not intended to represent the traditional school grading system of A, B, C, D, and F. The descriptions associated with each of the numbers focus on the level of student performance for each of the course learning outcomes listed below.

RATING SCALE:

4 – Accomplished 3 – Competent 2 – Developing 1 – Beginning

Course Learning Outcome #1—KNOWLEDGE: Students are literate and conversant of the basic concepts of ecology, structure of a natural ecosystem, interrelatedness within an ecosystem and between ecosystems, the influences of human practices on our island ecosystems, renewable and nonrenewable resources, and sustainability of resources

4	Complete all of the following tasks with 90% accuracy or better: <ul style="list-style-type: none"> Literate and conversant of the basic concepts of ecology, structure of a natural ecosystem, interrelatedness within an ecosystem and between ecosystems, the influences of human practices on our island ecosystems, renewable and nonrenewable resources, and sustainability of resources; s Synthesize knowledge of ecological concepts in discussions, oral presentations, and formal written assignments
3	Complete all of the above with 70-89% accuracy or better
2	Complete all of the above with 65-69% accuracy or better
1	Complete all of the above with less than 65% accuracy or better

Course Learning Outcome #2—CONSTRUCTING AN ARGUMENT: Students analyze and examine multiple perspectives of an environmental issue; creatively craft an opinion on the issue applying logic, wit, and skillfully present evidences that influence the audience's thinking and changes their minds or prompt some action.

4	Complete all of the following tasks with 90% accuracy or better: <ul style="list-style-type: none"> Demonstrate knowledge of particular environmental issue by providing a well defined environmental problem or question; Exhibits ability to coach audience in one direction by presenting both sides of an issue and exposes weak counterpoints; Discusses issue and presents convincing evidences that links effects to causes of problem; Demonstrate ability to evaluate information by thoughtfully selecting credible evidences to support position on the issue, avoid exaggerations, distinguish opinions from facts, and integrate provable statements that are tough to refute
3	Complete all of the above with 70-89% accuracy or better
2	Complete all of the above with 65-69% accuracy or better
1	Complete all the above with less than 65% accuracy or better

Course Learning Outcome #3—RESEARCH SKILLS: Students actively learns outside of the classroom through library research and field projects.

4	Complete all of the following with 90% accuracy or better: <ul style="list-style-type: none"> Exhibits ability to locate, select, and prioritize appropriate literature and other sources outside of the classroom to analyze and examine a local environmental issue; Demonstrate knowledge of issue by clearly identifying the problem and describes underlying cause(s) of the problem; Correctly interprets information and analyze information Creatively propose original ideas to mitigate the problem and future prevention strategies Draw conclusion based on research; Write a formal scientific paper applying the current MLA writing style format.
3	Complete all of the above with 70-89% accuracy or better
2	Complete all of the above with 65-69% accuracy or better
1	Complete all of the above with less than 65% accuracy or better

Course Learning Outcome #4 KNOWLEDGE APPLICATION AND SHARING: Student shares knowledge to diverse audience by preparing and presenting a community awareness presentation of a local environmental issue to a local audience; student engages in community activities to experience possible solutions to local and global problems

4	Complete all of the following tasks with 90% accuracy or better: <ul style="list-style-type: none"> Give an in-depth oral presentation which covered details and examples of relevant local and/or regional environmental issue; Demonstrated ability to present information in an organized and logical manner; Able to engage audience and included information that audience gain a comfortable understanding of the topic; Presentation demonstrates creativeness and inventiveness; Engage in multiple community activities, including but not limited to one personal interview with a local expert to experience possible solutions to local environmental problems
3	Complete all of the above with 70-89% accuracy or better
2	Complete all of the above with 65-69% accuracy or better
1	Complete all of the above with less than 65% accuracy or better