

Syllabus of Foundation Year Subject

Subject Title	: Ecological Perspectives – The Challenge of Our Times 從生態的視角看時代的挑戰
Code	: GEC230
Level	: 2
Credit Value	: 3.00
Offering Department	: General Education Centre
Offering Semester	: 2
Pre-requisite(s)	: Nil
Co-requisite(s)	: Nil
Exclusion(s)	: Nil
Medium of Instruction	: English

Contact Hours

Lecture	: 28 hours
Tutorial	: 14 hours
Total	: 42 hours

Objectives

Scientists point out that as a global civilization, we are living in a most peculiar point of time in history, we either change our behavior or there will be no future history! The major goal of this subject is to empower the student, regardless of their future career path, to take on the challenge of our times, to roll up their sleeves and participate in helping to turn this around, to do what the poet Gary Snyder calls “the real work”, to try and answer the question: “What is sustainable living?”

Learning Outcomes

This subject will introduce the student to the reality of the natural world of which they are an intimate reflection. On successful completion of this subject, students are expected to:

1. understand and apply science as a way of thinking;
2. exhibit systems thinking;
3. have a basic understanding of the origins of the Earth and its particular role in our solar system as the cradle of life;
4. understand the processes of evolution and mass extinction in shaping life on Earth;
5. understand the natures of ecosystem, biome, and biodiversity;
6. understand the natural history of the human species;
7. understand in broad terms the historical trends of collective human behaviour;
8. appreciate the peculiar point of time we live in and its fundamental challenge; and
9. understand different ecological perspectives, in particular as analyzed from the point-of-view of science, and what they have to offer in terms of insight and solution.

Teaching and Learning Approach

The analytic procedure of the scientific method will be emphasized. It will be demonstrated throughout as the means by which we can come to know so much about ourselves and the world around us. In the modern age, it is also the driving function of the technology that is being used to damage our all too vulnerable world. By virtually any meaningful measure, our current civilization is not sustainable. How can we do better? This subject looks in detail into what science can tell us about our behavior and its affect on the biosphere. Along the way, it examines many different perspectives in the light of scientific understanding. This is done through both participatory lectures, based upon pre-assigned readings as well as highly interactive tutorials. Emphasis will be placed

on the student developing a greater sense of community with nature. Throughout the semester, students will participate in exercises that not only teach ecology but learning-to-learn so as to better prepare themselves for success in the university and after graduation.

Tutorials are devoted to a series of computer-based ecosystem models culminating in the student developing an intuitive understanding of system dynamics in general, not just limited to ecosystems. The following is an indicative breakdown:

1. Introduction to Ecosystems
2. Ecosystems Modeling
3. Computer Simulations
4. Model AUTOCYCL
5. Model SLOREN
6. Model INTERACT
7. Model COOP

Assessment Method

Tutorial Performance	:	35%
Participation	:	25%
Mid-term Quizzes	:	40%
Total	:	<u>100%</u>

Keyword Syllabus

1. Introduction

2. The Scientific Method
 - Empiricism
 - Theory
 - Dialogue

3. The Natural History of Planet Earth
 - Geo-history, Evolution, and Mass Extinctions
 - Evolution by Natural Selection
 - Hydrological and Mineral Cycles
 - Ecosystems and Their Dynamics
 - Biomes and Biodiversity

4. The ABC's of Human Impact
 - Human Evolution: Challenge, Change, and Migration
 - Ecological Footprint

5. The Problem of Human Population
 - Limits and Taboos
 - History of Dealing with the Problem
 - Malthus and His Legacy
 - Optimism
 - Exponential Growth
 - Systems Thinking
 - Life on Earth Reviewed

- Hubbert's Pimple
6. The Search for Solutions
 - Nuclear Power
 - Carrying Capacity
 - The Unmanaged Commons; The Double C-Double P Game
 - Deep Ecology

Essential Reading

HARDIN, Garrett (1993). *Living Within Limits: Ecology, Economics, and Population Taboos*. New York: Oxford University Press.

Reference List

1. AXELROD, Robert. (1984). *The Evolution of Cooperation*. New York: BasicBooks.
2. AUTHOR. (2000). *Agenda 047 (II) Sustainability ... A Community Dialog* Hong Kong: Friends of the Earth.
3. BADINER, Allan Hunt (Ed.). (1990). *Dharma Gaia: A Harvest of Essays in Buddhism and Ecology*. Berkeley, CA: Parallax Press.
4. BOYDEN, Steven Vickers. (1992). *Biohistory: The Interplay Between Human Society and the Biosphere*. Paris: UNESCO; Parthenon Publishing Group.
5. BOYDEN, Steven Vickers, et al. (1981). *The Ecology of a City and Its People: The Case of Hong Kong*. Canberra, Australia: Australian National University Press.
6. CARSON, Rachel. (1962). *Silent Spring*. Boston: Houghton Mifflin.
7. COX, C. Barry and Peter D. MOORE. (1980, 3rd ed.). *Biogeography: An Ecological and Evolutionary Approach*. Oxford: Blackwell Scientific Publications.
8. DEVAL, Bill and George SESSIONS. (1985). *Deep Ecology: Living as if Nature Mattered*. Salt Lake City: Peregrine Smith.
9. KUTTER, G. Siegfried. (1987). *The Universe and Life: Origins and Evolution*. Boston: Jones and Barlett Publishers, Inc.
10. LEOPOLD, Aldo. (1949). *A Sand County Almanac and Sketches Here and There*. New York: Oxford University Press.
11. GILLMAN, Michael and Rosemary HAILS. (1997). *An Introduction to Ecological Modeling: Putting Theory into Practice*. Oxford: Blackwell Scientific Publications.
12. MEADOWS, Donella, Jorgen, RANDERS, and Dennis L. MEADOWS. (2004). *Limits to Growth: The 30-Year Update*. White River Jct., VT: Chelsea Green Publishing Company.
13. MILLER, Jr. G. Tyler. (1994). *Living in the Environment: Principles, Connections, and Solutions*. Belmont, CA: Wadsworth Publishing Co.
14. ODUM, Howard T. and Elisabeth C. ODUM. *Modeling for all Scales: An Introduction to System Simulation*. San Diego: Academic Press.
15. SCHUMACHER, E. F. (1973). *Small is Beautiful: Economics as if People Mattered*. New York: Harper & Row, Publishers.
16. SEED, John, Joanna MACY, Pat FLEMING, and Arne NAESS. (1988). *Thinking Like a Mountain: Towards a Council of All Beings*. Philadelphia, PA: New Society Publishers.
17. SNYDER, Gary. (1969). *Earth House Hold: Technical Notes & Queries To Fellow Dharma Revolutionaries*. New York: New Directions Publishing Corporation.
18. WENKE, Robert J. (1999). *Patterns in Prehistory: Humankind's First Three Million Years*. New York: Oxford University Press.