University of Science and Technology of Hanoi
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COURSE SYLLABUS

Subject: Ecology and Biodiversity
Academic field: Water-Environmental-Oceanography

Lecturer: GIRLEY S. GUMANAO
Phone:
E-mail : girley.gumanao@dnc.edu.ph

Academic year: 2016

COURSE DESCRIPTION

Credit points	3	
Level	Undergraduate	
Teaching time Location		
Time Commitment	Lecture	18 hrs
	Tutorial	4 hrs
	Practicals	3 hrs
	Labwork	5 hrs
	Total	30 hrs
Prerequisites	B1 courses in Biology, Chemistry and Physics	
Recommended background knowledge	None required	
Subject description:	This course provides an introduction to the science of Ecology and Biodiversity for undergraduate students with no specific background in ecology. Ecology is a "moving" science, especially nowadays, with new discoveries that highlight factors affecting local communities as well as global ecosystems. The science of Ecology is more and more useful and applied to solve current environmental problems we face on earth. The goal of this course is to give to students who specialized in environmental sciences a first approach of the main principles and concepts in Ecology. These principles and concepts will be mainly illustrated by examples related to environmental sciences. Chapters will usually start with a case study about an applied problem and short questions or exercises will be treated all along the course to help students assimilating and learning the concepts. Specific class exercises (tutorials) will be dedicated to develop students thinking	

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	and methods to solve problems. Ecology is the base of this course, but all along their second year of Bachelor in Water, Environment, Oceanography, the students will discover different aspects where ecology is present. This course will thus help them to make the link between several other courses such as hydrology, water pollution, atmospheric pollution, soil pollution, life cycle analyses. This will also let them connect biodiversity conservation strategies to restoration or rehabilitation of biodiversity.	
Objectives & Outcome	The principal points students should be able accomplish upon completion of the course are listed below : 1. Describe and explain the basic concepts of ecology and biodiversity and relate them in their field of specialization 3. Explain and analyze diagrams or figures related to ecological studies. Formulate and discuss hypotheses to solve simple ecological questions 4. Analyze Biodiversity Conservation strategies in the international and local (Vietnam) situation with emphasis on its goals and current conservation activities that contributes to restoration or rehabilitation of biodiversity. (field work); and 5. Collect data using some of the techniques to monitor biodiversity/ ecosystems and analyze and present results in the class (field work)	
Assessment/ Evaluation	Attendance/Attitude	10%
	Assignment (s)	20%
	Mid-term test/Exercise	20%
	Final exam	50%

COURSE CONTENTS & SCHEDULE

Schedule	**Topics**
September 21, 2016 (2-PM)	What is Ecology? Organisms and their environment
September 24 2016 (2-5PM)	III. Species and Levels of Biodiversity Species, Genetic and Ecosystems

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September 26, 2016 (2-5 PM)	IV. Populations Properties of Population (Distribution, Abundance/Density, Age Structure, sex ratios, dispersal) Growth and Mortality Population Regulation and Control Top-Down and Bottom-Up Regulation
September 27, 2016 (2-5 PM)	V. Interactions among organisms Specific Interactions, Population Dynamics, Competition, Predation, Parasitism and Mutualism.
September 28, 2016 (2-5 PM)	VI. Communities Species Richness, Relative Abundance, Diversity and Dominance Keystone Species Functional Groups Zonation
September 29, 2016 (2-5PM)	VI. Ecosystems Terrestrial , Aquatic and Marine Coastal and Wetlands
September 30, 2016 (2-5 PM)	VII. Applied and engineering ecology Ecological Engineering and Genetic Engineering International Treaties and Biodiversity Conservation Strategies
October 1, 2016 (2-5 PM)	Familiarization of Assessment Methods
October 2, 2016 (2-5 PM)	Field Activity
October 2, 2016 (2-5 PM)	Field Activity

- **Assessment/ Evaluation**

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Component	Attendance	Tutorials	Review questions (homework)	Midterm	Final exam
Percentage %	10	10	10	20	60

LITERATURES:

Elements of Ecology, 8th edition, Thomas Smith and Robert Leo Smith

Ecology, second edition, Michael L. Cain, William D. Bowman, Sally D. Hacker

The parrotfish–coral relationship: refuting the ubiquity of a prevailing paradigm, Garry R. Russ, Sarah‑Lee A. Questel, Justin R. Rizzari1 and Angel C. Alcala

Soft corals provide microhabitat for camouflaged juveniles of the Blackspotted wrasse *Macropharyngodon meleagris* (Labridae)

Ecological Engineering for Pest Management :Advances in Habitat Manipulation for Arthropods

Editors Geoff M. Gurr and Steve D. Wratten National Centre for Advanced Bio-Protection Technologies

Feeding Biology and Symbiotic Relationship of the Corallimorpaharian Paracorynactis hoplites (ANTHOZOA: HEXACORALLIA) Arthur R. Bos, Girley Gumanao and Benjamin Muller. The Raffles Bulletin of Zoology. 2011 59(2): 245–250

Ecology, second edition, Michael L. Cain, William D. Bowman, Sally D. Hacker

Companion website: sites.sinauer.com/ecology

General Ecology. 2012. David T. Chrone. Cengage Learning Asia

Predicting changes in community composition and ecosystem functioning from plant traits: revisiting the Holy Grail S. Lavorel and E. Garnier . Journal of Functional Ecology 2002 16, 545–556

A newly discovered predator of the crown-of-thorns starfish by A. R. Bos, G. Gumanao and Franco N. Salac. Coral Reefs (2008) 27:581 DOI 10.1007/s00338-008-0364-9

Ontogenetic habitat shift, population growth, and burrowing behavior of the Indo-Pacific beach star, Archaster typicus (Echinodermata; Asteroidea) Arthur R. Bos • Girley S. Gumanao • Marieke M. van Katwijk • Benjamin Mueller • Marjho M. Saceda • Rosie Lynn P. Tejada. Mar Biol (2011) 158:639–648 DOI 10.1007/s00227-010-1588-0

Population dynamics, reproduction and growth of the Indo-Pacific horned sea star, *Protoreaster nodosus* (Echinodermata; Asteroidea). Arthur R. Bos, Girley Gumanao, Joan Alipoyo and Lemuel T. Cardona. Mar Biol (2008) 156:55–63
DOI 10.1007/s00227-008-1064-2

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