

SW 209 Biodiversity

DePaul University

School for New
Learning

Winter Quarter 2007

O'Hare
Campus

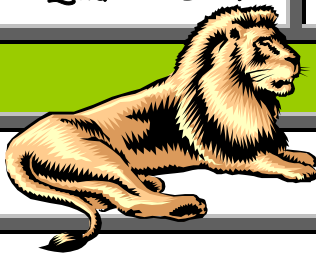
Tuesdays

1/09/07

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3/13/07

6:30–9:30
PM



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Note: E-mail is my primary means of communication with students. Phone messages will not be reviewed everyday.

COURSE DESCRIPTION: The science of Biodiversity is the study of life on earth, both past and present. It involves the exploration and measurement of the amount of genetic, species, and ecological variation on earth and is emerging as one humanity's most important and urgent endeavors. Scientific efforts to study earth's biodiversity have intensified because of our growing appreciation of the role human population growth and urbanization play in accelerating the extinction of plant and animal species. This course introduces you to central issues concerning life on earth including: the current state of biodiversity, valuing life's variations, human interconnections with and dependence on biological diversity, the origin and extinction of species, mass extinction, critical habitats at risk, and policies and approaches to conserve biodiversity.

LEARNING EXPERIENCE: This course makes use of the robust information resources available online on biodiversity topics. Students will be introduced to major biodiversity principles and issues through readings, links to internet resources, structured discussions and lecture, labs, a self-guided fieldtrip to an institution investigating biodiversity, and an original research paper on a current topic in biodiversity.

Competencies Offered	Competence Statement
S-2-A	Can describe, differentiate, and explain form, function, and variation within biological systems.
S-2-C	Can describe, categorize and explain development or change within physical or biological systems.
S-3-D	Can use scientific knowledge to understand varying perspectives on a policy issue.
S-4	Can describe and explain connections among diverse aspects of nature.

RELATIONSHIP OF THIS COURSE TO THE OFFERED COMPETENCIES

S-2-A : This course will explore and differentiate the ecological characteristics of major biomes on earth. This will include investigation of the great variety of life forms comprising biomes and how these faunal and floral assemblages change through time.

S-2-C : Core to understanding why certain of earth's habitats are more diverse than others is the study of interactions and exchanges between living organisms and their physical environments. In this course, students will examine how life both depends on and alters its physical surroundings. Our learning will include an examination of biodiversity over billions of years as expressed in the fossil record.

S-3-D : Scientists play the central role in acquiring and disseminating data that fuels debate about significant environmental issues. Students in Biodiversity will examine the ongoing interplay between scientific information and societal conservation practices.

S4: The stability and diversity of life on planet earth depends on a great variety of interrelated factors such as climate, ecology, and natural resources. This course will examine the important interconnections of nature that act to promote diverse life forms corresponding to the primary habitats of earth.

LEARNING RESOURCES:

Required Textbook:

Biodiversity: An Introduction (Paperback)

by Kevin J. Gaston (Author), John I. Spicer (Author), **Paperback:** 113 pages **Publisher:** Blackwell Science (June 1998) **ISBN:** 0632049537.

Additional Useful References:

Biodiversity (Paperback)

by D. C.) National Forum on BioDiversity (2nd : 1997 : Washington (Author), Frances M. Peter (Author), National Academy of Sciences (Corporate Author), Smithsonian Institution (Corporate Author), Edward O. Wilson (Editor) 521 pages, **Publisher:** National Academies Press (March 1988) **ISBN:** 0309037395.

Biodiversity: Exploring Values and Priorities in Conservation (Paperback)

by Dan L. Perlman (Author), Glenn Adelson (Author), **Paperback:** 192 pages, **Publisher:** Blackwell Publishing, Incorporated; 1 edition, **ISBN:** 086542439X.

Biodiversity II. Reaka-Kudla, M. L., Wilson, D.E., Wilson, E.O., 1997. Joseph Henry Press, 551p.

Global Biodiversity, Groombridge, B., 1992. Chapman & Hall Publishers, 558p.

(Additional Readings and Handouts will be supplied in class or at the Blackboard site)

LEARNING STRATEGIES:

Each Session the instructor will introduce new concepts and examples through lecture and discussion. Students will be responsible for weekly readings and active participation in discussions. Most Sessions, students will work in groups on laboratory exercises that apply the principles learned that session. Students will conduct independent research into a biodiversity topic. Class will include:

Lectures/Blackboard Website	Online Resources from institutions
Discussions	Multimedia
Readings (Text and Supplementary)	Original Inquiry
Laboratory Exercises/Biologic and Paleontologic Specimens	A Biodiversity Field Trip (self-directed)

GENERAL COURSE OUTCOMES: Upon successful completion of this course, all students are expected to have demonstrated:

- ❑ A basic working definition and knowledge of the science of biodiversity.
- ❑ An understanding of humanity's dependence and impact on Biodiversity.
- ❑ An understanding of the connections between physical and biological factors governing Biodiversity.
- ❑ An understanding of the major trends and patterns of Biodiversity through earth history.
- ❑ An understanding of scientific and governmental conservation practices to conserve and protect Biodiversity.
- ❑ The ability to analyze information generated from scientific investigations on Biodiversity.

COMPETENCE-SPECIFIC LEARNING OUTCOMES: Upon successful completion of the selected competence, a student will be able to:

S-2-A : Student will be able to describe, and differentiate the character of a living group of their choice (e.g., bats or oaks or corals etc.). When this has been accomplished, the student will then assess the forms, function, and variation within this group.

S-2-C : Student will demonstrate an understanding of the basic principles of evolution and ecology as they provide a basis for understanding biodiversity. Students will be able to apply evolutionary and ecological principles to explain the development or change within biological systems and address biodiversity conservation issues.

S-3-D: Student will be able to select a current debate/issue in the area of biodiversity. Student will be able to then research, compare and contrast both the scientific side of "what is known" and the social side of "what is being done". A student will analyze the ongoing interplay between scientific information and societal action and change. Students are expected to critically review information and provide a history and analysis of the topic.

S-4: Student will be able to describe and employ various principles of ecology to address problems and/or questions concerning the interconnections of biodiversity to climate, resources, extinction, evolution, and/or conservation.

LEARNING ASSESSMENT:

Biodiversity is a graded course. Your final grade in will be based on your progress towards completing the activities and deliverables listed below.

For all competencies students need to demonstrate an **understanding and application of concepts, theories and factual information concerning the science of Biodiversity**, by successful completion of: 1) a practical examination (take-home), 2) a science-formatted **Research Paper** focusing on a biodiversity issue in one or both of your competence areas, 3) a short (5-7 minutes) oral presentation of research findings, 4) participation in in-class lab exercises, 5) preparation for and participation in class discussions, and 6) a self-directed field trip and report.

Evaluation Weighting:

1. Attendance/Preparation and participation in discussions and labs	10%
2. Field Trip Report	10%
3. Original research paper	
a) written portion....	50%
b) oral portion.....	5%
4. Take-home practical examination for respective competencies	25%

INSTRUCTOR'S ATTENDANCE POLICY

Attendance is mandatory and essential for success in Biodiversity. Two or more sessions missed will likely result in a "fail" grade for Biodiversity, not an "incomplete". The instructor should be notified of the circumstances for all absences prior to the class session. Class materials for sessions missed can be obtained on the Blackboard website for the course. **No** graded work or handouts will be faxed to students.

HANDOUT POLICY

The instructor will provide students copies of the class materials for the first session. Subsequent to the first session, students should printout and bring to class the materials for that session posted on the course's Blackboard site.

ACADEMIC INTEGRITY POLICY

The instructor follows DePaul's policy on Academic Integrity on matters of student conduct including issues of plagiarism. (Please see the student handbook for details at <http://studentaffairs.depaul.edu/handbook/code16.html>). Avoiding plagiarism is

particularly important in Biodiversity because of the extensive use of other people's research and ideas in the research paper. This course regularly utilizes the Turnitin© plagiarism detection software.

ELECTRONIC SUBMISSIONS POLICY

It is acceptable to submit drafts of work as e-mail attachments. Submissions should be sent in the Word format and should not be sent as Zipped files. The final draft of your research paper and practical exam must be turned in as both a hard copy and an electronic copy.

INCOMPLETE GRADE POLICY

Students are expected to finish the assignments of their courses in a timely manner. It is at the discretion of the instructor whether a student shall be granted an incomplete grade with the possibility extended time (determined by the instructor) for completion of class work. In order for a student to have an incomplete grade granted in this course, there must be a significant extenuating circumstance evidenced by the student (e.g., medical and/or significant personal issues). The student will need to initiate and file an SNL Incomplete grade contract before the final session of the course to receive an incomplete grade. Students are strongly advised to review the university deadlines for withdrawal without financial and/or grade implications.

BIODIVERSITY

SCHEDULE OF ACTIVITIES

NOTE: Readings and assignments should be completed before the respective class session for which they are listed. (Chapters refer to the Textbook; Other Readings as indicated)

<i>Sessions Topic</i>	<i>Readings and Assignments</i>
<i>Session 1 Introduction to the Science of Biodiversity:</i>	
<ul style="list-style-type: none"><i>• Course Requirements and Expectations</i><i>• What is Biodiversity?</i><i>• Ways of Seeing the Biosphere</i><i>• Why is biodiversity important?</i>	
<i>Session 2 The Origin and Extinction of Life:</i>	<i>Assignment 1: Chapter 1</i>
<ul style="list-style-type: none"><i>• How does Biodiversity Originate and go extinct?</i><i>• Origin of Life on Earth</i><i>• Evolution and Current genetic, Species and Ecosystem Biodiversity.</i><i>• Factors that promote the extinction of species</i>	<i>Assignment 2: Review the website on Biodiversity in Crisis at:</i> http://research.amnh.org/biodiversity/crisis/index.html <i>Write a paragraph about your impression of whether there is a biodiversity crisis.</i>
	<i>Assignment 3: Begin Biodiversity Research Paper</i>
	<i>Additional Resource:</i> http://www.gla.ac.uk/Project/originoflife/html/2001/menu.htm
<i>Session 3 Biodiversity Through Time</i>	<i>Assignment 4: Chapter 2</i>

- *Biodiversity through time: The Fossil Record*
- *Extinction and Mass Extinction*
- *How much Biodiversity is there?*
- *Global Biodiversity and its Decline*
- *Current State of Biodiversity*

Assignment 5: Turn in for your Research Paper:

1) *Topic Area*

2) *Brief description of your research question*

3) *Several scholarly references relevant to your topic*

Additional Resource:

<http://geol.queensu.ca/museum/exhibits/dawnex.html>

Session 4 Evaluating and Estimating Biodiversity

- *History and Measurement of Biodiversity*
- *Systematics and Biological Diversity*
- *Names : The keys to Biodiversity*
- *Taxonomic Preparedness*
- *Information Management for Biodiversity*

Assignment 6: Chapter 3

Assignment 7: Begin the Self-Directed Biodiversity Fieldtrip

Session 5 Valuing Biodiversity

- *Different perspectives on valuing Biodiversity*
- *Human Dependence on Biodiversity*
- *Economics and Biodiversity Preservation and Valuation*
- *Museums, Research Collections and the Challenge of Biodiversity*

Assignment 8: Chapter 4

Assignment 9: Begin Take-Home Practical Exam

Additional Resource:

<http://www1.oecd.org/publications/e-book/9702021E.PDF#search=%22biodiversity%20valuation%22>

Session 6 Patterns of Earth's Modern Biodiversity

- *Introduction to Habitats and Ecosystems*
- *Global Biodiversity of Tropical Reefs and Oceans*

Additional Resource:

http://www.eoascientific.com/campus/earth/resources/earths_biomes

- *Endangered and Fragmented Forests*
- *Islands*
- *Biodiversity in the Midwest and Urban Biodiversity*

Session 7 Diversity at Risk: Threats to Biodiversity

- *Human Impacts and Natural Factors*
- *Effect of Global Change on Natural Communities*

Assignment 10: Chapter 5

Assignment 11: Research Paper: Detailed Outline and (8) scholarly references Due

Assignment 7: Fieldtrip Report Due

Session 8 Conservation Science and Biodiversity

- *Sustainability*
- *GAIA and Earth's Interconnections*
- *Science and Technology: How can they help?*
- *Conservation-Technology Examples*
- *Restoration Ecology*

Assignment 11: Chapter 6

Assignment 9: Take-Home Practical Exam DUE at beginning of session

Session 9 Geopolitics and Biodiversity

- *Alternatives to Destruction*
- *Policies to protect Biodiversity*
- *International Efforts*

Additional Resource:

<http://www.biodiv.org/default.shtml>

Session 10 Summary and Student Presentations

Assignment 3: Research Paper Due (Session 10)

Student Presentations