DePaul | School of Continuing and Professional Studies

Biodiversity
Undergraduate Course Information Guide

Course Number: CCS 332, 2 or 4 credits, 10 Weeks
Cross listed Course Number: SNC 225, 4 credits, 10 Weeks
Delivery Formats: Online Async

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 students to the nature of science and the central issues concerning life on earth including: the current state of biodiversity, valuing life's variations, human dependence on biological diversity, the origin and extinction of species, mass extinction, critical habitats at risk, and policies and approaches to conserve biodiversity.

Learning Outcomes

After completing this course, you will be able to:

• Describe, differentiate, and explain form, function, and variation within biological systems.

• Describe, categorize, and explain development or change within physical or biological systems.

• Use scientific knowledge to understand varying perspectives on a policy issue.

• Describe and explain connections among diverse aspects of nature.

• Explain and evaluate the nature and process of science.

Learning Outcomes for SNC 223: Liberal Studies Program - Scientific Inquiry: Science as a Way of Knowing Domain

1. Students will understand the scientific worldview. As a result of their learning in this course, students will be able to:

- Identify the types of questions that can and cannot be answered by science, and recognize the strengths and limitations of science in answering questions about the natural world.
- Critically evaluate the assumptions that underlie scientific investigations.
- Substantiate the claim that scientific knowledge is durable but can evolve with new evidence and perspectives.

2. Students will understand the nature and process of science. As a result of their learning in this course, students will be able to:

- Connect evidence to the predictions made by theories and hypotheses, and then assess the extent to which the presented evidence supports or refutes a scientific claim.
- Evaluate the role of creativity, curiosity, skepticism, open-mindedness and diligence of individuals in scientific discovery and innovation.
- Recognize the uncertainty inherent in the scientific approach and evaluate scientists' efforts to minimize and understand its effect through experimental design, data collection, data analysis and interpretation.
- Evaluate the role of communication, collaboration, diversity and peer review in promoting scientific progress and the quality of scientific evidence and ideas, and ensuring compliance with ethical standards.
- Determine the extent to which science both influences and is influenced by the societies and cultures in which it operates.
- Apply scientific approaches to problem solving and decision-making in their own lives, and evaluate how scientific knowledge informs policies, regulations, and personal decisions.

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Learning Strategies and Resources

Some learning activities, assignments and deadlines will vary depending on the delivery format of the course and may differ slightly from what is presented in this document.

The Biodiversity course is subdivided into ten (10) modules. For each of the modules, you will be introduced to new concepts and examples through readings and/or internet links. You will be responsible for regular participation in class discussions highlighting

issues from the readings and course materials. Laboratory exercises or virtual fieldtrips building on the principles of biodiversity learned that week will take place in alternating modules. You will undertake a self-directed fieldtrip to a biodiversity resource and will also write a research paper on a biodiversity topic of your choice, consistent with the structure of a scientific journal.

Required Readings

Books and learning materials are available at the DePaul bookstore, at http://depaul-loop.bncollege.com, or through alternative sources.

Gaston, K. J., & Spicer, J. I. (2004) Biodiversity: An introduction. Oxford: Blackwell Science. Paperback: 208 pages, Publisher: Wiley-Blackwell; 2nd Edition biodiversity (11 Dec. 2003) Language: English
ISBN-10: 1405118571
ISBN-13: 978-1405118576

Online Virtual Lab Resources:

Simulations

Virtual Biology Lab : http://virtualbiologylab.org/

Using Biofilms to Estimate biodiversity
https://www.mdseagrant.org/interactive_lessons/biofilm/

Lizard Evolution Virtual Lab http://www.hhmi.org/biointeractive/lizard-evolution-virtual-lab

Data Sets

Tree of Life http://tolweb.org/tree/

Building a Cladogram SimpleClade: http://guilfordgeo.com/simpleclade/

Marine Biodiversity http://nsdl.oercommons.org/courses/obis-special-edition/view

Learning Deliverables

Students will be assessed through a variety of approaches in Biodiversity including online discussions, lab reports, a research paper, virtual fieldtrip reports, and a self-directed fieldtrip report.

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Assessment of Student Learning

Grading Practices

A The instructor judged the student to have accomplished the stated objectives of the course in an EXCELLENT manner.

B The instructor judged the student to have accomplished the stated objectives of the course in a VERY GOOD manner.

C The instructor judged the student to have accomplished the stated objectives of the course in a SATISFACTORY manner.

D The instructor judged the student to have accomplished the stated objectives of the course in a POOR manner.

F The instructor judged the student NOT to have accomplished the stated objectives of the course.

IN Temporary grade indicating that, following a request by the Student, the Assistant Dean for Student Affairs and the Instructor have given permission for the student to receive an incomplete grade.

Distribution of Grade Points

Graded Assignments	**Percentage of Final Grade**
Discussions (10 x 20 points)	20%
Lab Reports	25%
Research Paper (Topics and References)	2.5%
Research Paper (Final)	20%
Virtual Fieldtrip Reports	12.5%
Self-directed Field Trip Report	20%

Grading Scale

A = 93 to 100	A- = 90 to 92	B+ = 87 to 89
B = 84 to 86	B- = 80 to 83	C+ = 77 to 79
C = 74 to 76	C- = 69 to 73	D+ = 65 to 68

D = 60 to 64	F = 59 or below	INC

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Course Schedule

Week or Module Title or Theme	Readings / Learning Activities	Graded Assignments
Week 1, Module 1: Nature of Science	Supplemental: http://undsci.berkeley.edu/teaching/misconceptions.php	VFT 1 Virtual Biology Lab Estimating Stream Biodiversity http://virtualbiologylab.org/biodiversity-ecology/ Research Paper Start
Week 2, Module 2: Introduction to the Science of Biodiversity	(Chapter 1) What is Biodiversity Supplemental: Building a Cladogram https://www.youtube.com/watch?v=ouZ9zEkxGWg Why is Biodiversity Important? Short Videos: https://www.youtube.com/watch?v=GK_vRtHJZu4 https://www.youtube.com/watch?v=7tgNamjTRkk	
Week 3, Module 3: The Origin and Evolution of Life	Supplemental: Evolution 101 http://evolution.berkeley.edu/evolibrary/article/evo_01 Origin of Life NOVA video http://www.pbs.org/wgbh/nova/evolution/origins-life.html	VFT2 Lizard Evolution Virtual Lab http://www.hhmi.org/biointeracti ve/lizard-evolution-virtual- lab Just the first two modules. Download the worksheet as a guide to the first two modules. Research Hypothesis and Initial

		References Due
Week 4, Module 4: Biodiversity: The Fossil and Contemporary Record	(Chapter 2) Biodiversity Through Time From the Cambrian Explosion to the Great Dying	LAB-2 Evolution: The Origination and Extinction of Biodiversity Self-Directed Fieldtrip Start
Week 5, Module 5: Extinction and Mass Extinction	Supplemental: Mass Extinction (K-T Example) https://www.youtube.com/watch?v=tRPu5u_Pizk	VFT3 WGBH Video (Firm). (2001). Evolution. #2 & #3 on Extinction https://www.youtube.com/watch?v=L5DaOlpXtmQ https://www.youtube.com/watch?v=Y4Py6pB8FMI
Week 6, Module 6: Mapping, Estimating and Evaluating Biodiversity: Habitats and Ecosystems	VFT3 WGBH Video (Firm). (2001). Evolution. 3 on Extinction https://www.youtube.com/watch?v=L5DaOlpXtmQ https://www.youtube.com/watch?v=Y4Py6pB8FMI	VFT3 WGBH Video (Firm). (2001). Evolution. #2 & #3 on Extinction https://www.youtube.com/watch?v=L5DaOlpXtmQ
Week 7, Module 7: Valuing Biodiversity	(Chapter 4) Does Biodiversity Matter? watch?v=iTW05vFILXY Hedonic Pricing Methodhttps://www.youtube.com/watch?v=LkXVCQam5kw Linking Ecology and Economics for Ecosystem Management Supplemental: Environmental Economics https://www.youtube.com/watch?v	VFT4 Using Biofilms to Estimate biodiversity Evaluate: 1) Virtual Samples and 2) Biodiversity at Depth https://www.mdseagrant.org/interactive_lessons/biofilm/index.html

	=dHn_bNfbllA Valuation of Ecosystem Services: Classes of Values https://www.youtube.com/watch?v=q8AZHtF2f50 Market Based Valuation Method https://www.youtube.com/watch?v=M0ZdV5WU5K4 Contingent Valuation https://www.youtube.com/watch?v=__xzmIG4L8s Travel Cost Methodhttps://www.youtube.com/watch?v=AjcQpzIBu1I Avoided Cost Methodhttps://www.youtube.com/watch?v=hOX6WrR79Ao Replacement Cost Methodhttps://www.youtube.com/watch?v=iTW05vFILXY Hedonic Pricing Methodhttps://www.youtube.com/watch?v=LkXVCQam5kw	
Week 8, Module 8: Human Impacts: Threats to Biodiversity	(Chapter 5) Human Impacts Great Barrier Reefhttps://www.youtube.com/watch?v=aGGBGcjdjXA	LAB-4 Biomes and Habitats: Conserving Biodiversity
Week 9, Module 9: Global Perspectives of Biodiversity: Culture & Economy	Supplemental: Meet the Ranchers Who Claim the Brazilian Amazon is Theirs to Burn https://www.youtube.com/watch?v=TcJUSMiKQyY	VFT5 Conservation Ecology (pick 2 simulations) http://virtualbiologylab.org/conservation-ecology/ Self-directed Field tip Due

Week 10, Module 10: Conserving and Sustaining Biodiversity	(Chapter 6) Maintaining Biodiversity Supplemental: Australia's biodiversity: Indigenous perspectives https://www.youtube.com/watch?v=_vL9WZ9xYUg Ecological Restoration https://www.youtube.com/watch?v=VNwQ6cRMTKI Restoration: https://www.youtube.com/watch?v=V_a0ysp4g2E	LAB-5 Valuing Biodiversity: Biodiversity and Geopolitics: Sustainable growth and Biodiversity Treaty Exercise Research Paper Due

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Course Policies

For access to all SCPS and DePaul University academic policies, refer to the following links:

SCPS Student Resources Website

DePaul Student Handbook

The D2L Course Website for this course.

Course Syllabus

The official syllabus for this course that includes course dates, instructor information and quarter specific details will be provided by the course instructor by the start of the course and available on the course D2L website.

Course Registration

To find out when this course will be offered next, you can go to the SCPS Registration website for details on how to register for the course.

For information on how this course can apply to your program, contact your academic advisor.

School of Continuing and Professional Studies

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