

DePaul University, School of Continuing
and Professional Studies

BIODIVERSITY
SNC 225 & SW 332
Syllabus



Duration: 11 Weeks

Online Asynchronous

Faculty: Kevin F. Downing Ph.D.

Office hours:
By appointment.

E-mail: kdowning@depaul.edu

Mailing Address:
14 E. Jackson, Suite 1400
Chicago, IL 60604

Phone: 312/476-3618 (Loop)

Zoom Meeting: by
appointment

Contents

Course Description	3
Demonstration of SWK Outcome/ Scientific Inquiry Elective	4
SCPS Learning Outcomes	7
Learning Strategies and Resources	8
Learning Strategies.....	8
Learning Resources	9
Learning Deliverables and Assessment of Learning.....	10
Assessment Approaches	10
Discussions	10
Lab Reports	10
Research Paper Topics, References, and Final Draft	10

Virtual Fieldtrip Reports	10
Self-directed Field Trip Report	11
Summary of Assignments, Point Values, and Percentages.....	11
Student Time Commitment to Practical Learning (Excludes reading, research, paper writing and study)	12
Writing Expectations.....	13
Grading Policies and Practice.....	13
Turnitin Plagiarism Review of Assignments	13
Late Work Policy.....	13
Course Grading Scale	14
DePaul University Rubric for Letter Grades	14
News Items and Discussion Forums for Online Courses.....	15
Course Policies	17
Course and Workload Expectations.....	17
Online Participation Guidelines	17
Course Netiquette.....	17
Instructor's Role	17
Office Hours	18
Student's Role	18
College and University Policies	18
Essential Policies for this Course.....	18
Protection of Human Subjects in Research.....	19
Additional Course Resources	19
About the Instructor/Course Author	20
Biodiversity Course Schedule.....	21
Appendix I - Additional Resources	24
Useful Video Resources:.....	24
Additional Useful Literature Resources:	24

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

The *Biodiversity* course supports the learning outcomes for the Scientific Inquiry Elective/Science as a Way of Knowing (SWK) within the Liberal Studies Program. These outcomes are:

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

- a. 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.
- b. Critically evaluate the assumptions that underlie scientific investigations.
- c. 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:

- a. 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.
- b. Evaluate the role of creativity, curiosity, skepticism, open-mindedness and diligence of individuals in scientific discovery and innovation.
- c. 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.
- d. 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.
- e. Determine the extent to which science both influences and is influenced by the societies and cultures in which it operates.
- f. Apply scientific approaches to problem solving and decision-making in their own lives, and evaluate how scientific knowledge informs policies, regulations, and personal decisions.

Demonstration of SWK Outcome/ Scientific Inquiry Elective

You will be introduced to the nature of science and major biodiversity principles and issues through readings, links to internet resources, structured online discussions, online simulations, laboratory assignments, virtual fieldtrips, a self-guided fieldtrip to a local biodiversity reserve or institution, and a research paper on a current topic in biodiversity.

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

a. 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.

The central learning outcome of this course is for you to understand and apply the principles and methods that biologists and paleontologists use to investigate biodiversity, which is the exploration and measurement of the amount of genetic, species, and ecological variation on earth through time. You will learn that questions scientists pursue concerning biodiversity are based on experiments and measurements with inherent accuracy and precision considerations. Likewise, you will consider how the inferences and conclusions scientists make about biodiversity are often deduced from extrapolation and modeling.

Examples of assignments:

You will read about the nature of science and scientific uncertainty as presented in the Understanding Science 101 website sponsored by the National Science Digital Laboratory at: <http://nsdl.oercommons.org/courses/understanding-science-misconceptions-about-science/view> After review of this web resource, you will undertake an online discussion with questions centering on the uncertainty of determining biome biodiversity based on sampling methods.

Likewise, you will gain practical experience in sampling biodiversity through the course's Lab 1 on Classifying and Estimating Biodiversity which will include examining the limitations of estimating biodiversity and whether these limitations negate the validity of assessing biodiversity patterns for particular regions, biomes and in other circumstances.

b. Critically evaluate the assumptions that underlie scientific investigations.

You will evaluate the predictive strength of the theories and data for describing how life originates, adapts, evolves and becomes extinct. In particular, you will critically examine the assumptions underlying how biodiversity patterns are established in the fossil record with discontinuous data and how the assumptions around heredity, defining species, variation in species, and natural selection explain both the interconnections between and the diversification of life.

Examples of assignments:

You will read about the character of the fossil record as presented in textbook Chapter 2 on 'Biodiversity Through Time' as well as the theory and mechanisms of evolution presented in the NSDL website Evolution 101 at: <http://nsdl.oercommons.org/courses/evolution-101/view> .

You will then participate in an online discussion with forum questions centering on measuring past biodiversity via the fossil record and the assumptions scientists employ about fossil representation in the stratigraphic record. In addition, you will deliberate on how living species are defined and the application of this principle for calculating trends in biodiversity. You will obtain practical experience in evaluating both fossil biodiversity and speciation mechanisms in the course's Lab 2 on Species Diversification and Extinction.

c. Substantiate the claim that scientific knowledge is durable but can evolve with new evidence and perspectives.

You will explore the historical development of evolutionary theory from Darwin's recognition of species adaptation and natural selection to the contemporary integrated theory of evolution involving underlying genetic-based heredity and mutation. You will consequently gain an appreciation of the accumulative strength and predictive value of evolutionary theory to

explain the expansion and character of life's diversity over the last 3.8 billion years. You will also assess the current state of biodiversity, human dependence on biological diversity, critical habitats at risk, and approaches to conserve biodiversity. You will explore how perspectives on these topics have changed with improved scientific insights.

Examples of assignments:

You will read the textbook chapters on Mapping Biodiversity, Does Biodiversity Matter, Human Impacts, and Maintaining Biodiversity in order to engage in online discussions around the robustness of biodiversity data and corresponding conservation practices.

You will obtain practical experience in contrasting various perspectives on biodiversity as well as stipulating your own perspective as you engage in the course's Lab 4 on Putting a Value on Biodiversity and Lab 5 on Sustainable Development and the Biodiversity Treaty.

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

a. 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.

Evolutionary theory predicts many things including that species will change through time, that new species will arise, that extinction of species occurs, that organismal structure will become more complex over time, that valuable features may evolve independently, and that

microevolutionary phenomena (e.g., at the individual and genetic level) will be coupled to environmental conditions and variation. In the Biodiversity course, evidence for many of these predictions will be assessed. For example, you will examine data from the fossil record to determine if the record of life: 1) changed through time, 2) became more complex, 3) is marked by extinction, and 4) shows comparable but independent development of features. Likewise, you will critically evaluate the data and methods employed to characterize present-day biodiversity as well as conservation theories for sustaining biodiversity founded on microevolutionary and ecological principles.

Examples of assignments:

You will read about the character of the fossil record as presented in the course textbook Chapter 2 on Biodiversity Through Time as well as Chapter 6 on Maintaining Biodiversity and participate in online discussions that center on evaluating the veracity of scientific claims about earth's biodiversity through time and whether contemporary trends in biodiversity represent a 6th mass extinction.

You will also develop a biodiversity hypothesis of your own and undertake a self-directed fieldtrip to a biological park to test it (e.g., zoo, botanical garden, aquarium, arboretum, natural area, or natural history museum). You will test your supposition by evaluating species variation,

functional morphology, the ecological interconnections between organisms, and/or the conservation practices employed to sustain biodiversity.

b. Evaluate the role of creativity, curiosity, skepticism, open-mindedness and diligence of individuals in scientific discovery and innovation.

As a part of Module 3, you will watch and discuss the NOVA video on "What Darwin Never Knew" that details the creativity and genius that launched modern evolutionary theory.

c. 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.

This course incorporates the rich online resources available on biodiversity topics. As a part of the virtual fieldtrip assignments of alternating modules, you will carry out online simulations that will engage you in experimental design choices, data collection, data analysis and interpretation as well as have you confront the limitations of inferences drawn from these experiments.

d. 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.

The Biodiversity course activities and assignments regularly model the scientific enterprise including how knowledge is integrated, reviewed, and disseminated. For example, you will complete a scientific-styled research paper using peer-reviewed journal sources and employing key scientific reasoning steps (e.g., developing a hypothesis, formulating a methodology, analyzing available data, expressing results and conclusions, and describing study limitations). You will also collaborate with classmates through an online discussion forum as you seek and provide feedback concerning your research topic and methods.

e. Determine the extent to which science both influences and is influenced by the societies and cultures in which it operates.

You will have opportunities to contrast different societal and cultural perspectives on the issue of biodiversity, particularly in the area of conservation. For example, in Lab 5 on Sustainable Development and the Biodiversity Treaty, you will take on the role of a leader of either a developed or developing country. You will work towards formulating a general compromise on a Biodiversity Treaty despite the competing economic and cultural interests you face. You will therefore learn about the ongoing interplay between scientific information and societal action and change.

f. Apply scientific approaches to problem solving and decision-making in their own lives, and evaluate how scientific knowledge informs policies, regulations, and personal decisions.

As a point of closure in the Biodiversity course, you will be provided the opportunity to convey your own perspective on the biodiversity issues including any plans for sustaining biodiversity in your own lives and community based upon knowledge acquired throughout the course. This will be part of the final online discussion

SCPS Learning Outcomes

Students from the School of Continuing and Professional Studies BAIFA program will fulfill their selected 1 or 2 competencies from the following offerings:

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.
S-5: Can explain and evaluate the nature and process of science.

Learning Strategies and Resources

Learning Strategies

The Biodiversity course is subdivided into ten (10) modules (see Table below). 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.

Module #	Topics
1	Nature of Science
2	Introduction to the Science of Biodiversity
3	The Origin and Evolution of Life
4	Earth's Dynamic Biodiversity: The Fossil and Contemporary Record
5	Extinction and Mass Extinction
6	Mapping, Estimating and Evaluating Biodiversity
7	Valuing Biodiversity
8	Human Impacts: Threats to Biodiversity
9	Global Perspectives of Biodiversity: Culture & Economy
10	Conserving and Sustaining Biodiversity

Learning Resources

Required Textbook: (To buy your books, go to <http://bookstore.mbsdirect.net/depaul.htm>)

You are encouraged to seek the textbook at discounters for the lowest price.

Gaston, K. J., & Spicer, J. I. (2004) *Biodiversity: An introduction*. Oxford: Blackwell Science.

Paperback: 208 pages

Publisher: Wiley-Blackwell; 2nd Edition edition (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

Phylot: <https://phylot.biobyte.de/>

Learning Deliverables and Assessment of Learning

Assessment Approaches

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.

Discussions. (200 points). Each unit of the course has its own discussion forum for a total of 10. Discussion forum questions are formulated by the instructor to motivate your interaction and reflection around that module's topics. An excellent response is considered 1) accurate, 2) original, 3) relevant, 4) imparts something new to classmates, 5) clearly incorporates information from the readings and/or other learning materials, and 6) is well written. Excellent responses add substantial teaching/learning presence to a course and stimulate additional thought about the topic under discussion

Lab Reports. (250 points). In alternating units of the course, you will undertake lab activities structured to reinforce biodiversity principles, the nature of science, and scientific reasoning. There are 5 laboratory reports with the themes:

- L1 Classification: Sorting Out Life's Variety and its abundance
- L2 Evolution: The Origination and Extinction of Biodiversity
- L3 Measuring Biodiversity: Richness and Evenness
- L4 Biomes and Habitats: Conserving Biodiversity:
- L5 Valuing Biodiversity: Biodiversity and Geopolitics: Sustainable growth and Biodiversity Treaty Exercise

Research Paper Topics, References, and Final Draft. (225 points). You are provided a detailed guideline for writing a scientifically formatted research paper in the course materials. The research paper will center on a biodiversity topic of your own choosing. Early in the course you are required to submit your research question and approach. Your final draft is due near the end of the course. An excellent research paper has the following qualities: 1) the research question is original and relevant; 2) paper adheres to the required scientific format; 3) resources are scholarly and relevant; 4) scholarly information is integrated and synthesized; 5) citations are of proper format and used consistently; 6) information is evaluated reasonably and critically; 7) corresponding conclusions are consistent with preceding information and arguments.

Virtual Fieldtrip Reports. (125 points). In alternating weeks, you are required to work through online fieldtrip exercises often with interactive online multimedia such as simulations and videos that reinforce module topics. An excellent virtual fieldtrip summary has the following qualities: 1) a summary of the key concepts presented, 2) specific examples of simulation results, etc., 3) a reflective statement about how the learning helped you gain a better understanding of the module, and 4) the summary is well written.

Self-directed Field Trip Report. (200 points). You will undertake a scientific investigation to test a hypothesis about a biodiversity topic of your choice. You are required to visit a biological park to test it (e.g., zoo, botanical garden, aquarium, arboretum, natural area, or natural history museum). Alternatively, you can assess the biodiversity around your residence. An excellent report has the following qualities: 1) statement of research question and observations, 2) specific examples of what was observed, 3) detailed results and conclusions, 4) reflection on the results of the learning activity, and 5) information is accurately communicated and report is well written.

Summary of Assignments, Point Values, and Percentages

Grading Category:	Number of Assignments	Point Value Each	Total Point Value	% of Final Grade:
Discussions	10	20	200	20%
Lab Reports	5	50	250	25%
Research Paper (Topics and References)	1	25	25	2.5%
Research Paper (Final)	1	200	200	20%
Virtual Fieldtrip Reports	5	25	125	12.5%
Self-directed Field Trip Report	1	200	200	20%
Total			1000 Points	100%

Student Time Commitment to Practical Learning (Excludes reading, research, paper writing and study)

Laboratories	<p style="text-align: center;">Seat Time Minimum Expected Time Allotment</p> <p>Includes preparation, conducting lab, notetaking, developing formal report, and sharing and analyzing data with class as applicable.</p>	
Lab 1- Classification	3 Hours	
Lab 2- Evolution	3 Hours	
Lab 3- Measuring Biodiversity	3 Hours	
Lab 4- Conserving Biodiversity	3 Hours	
Lab 5- Valuing Biodiversity	3 Hours	
	Subtotal	15 Hours minimum
Discussions	0.5 hours each X 10 (Includes review of other student responses and an original contribution)	5 Hours
Virtual Fieldtrips	1.5 hours each X 5 (Includes conducting simulation and/or review of multimedia)	7.5 Hours
Self-directed Fieldtrip	5.0 hours X 1	5.0 Hours
	Total	32.5 Hours

Writing Expectations

To assess student learning, the Biodiversity course incorporates several forms of writing assignments including laboratory reports, a research paper following a scientific journal format, an exam, virtual fieldtrip reports, weekly online discussion responses, and a self-directed fieldtrip report. The 5 laboratories incorporate worksheets that serve as the template to collect and analyze data, develop summaries and conclusions, and present information in an essay format. The required research paper follows a science journal format and has an expected length of about 2500 words. Five virtual fieldtrip reports of 250 words each are submitted on a standardized form centering on interactive multimedia examples of concepts and student reflection. Students are also required to submit a self-directed fieldtrip report of about 750 words that is structured in a scientific format involving testing a hypothesis through observations and data collection via a local biological park of their choice. Lastly, students' weekly discussions of about 150 words conducted online require original written contributions based upon course materials as well as collegial responses to classmate submissions.

Each writing assignment type above has a detailed set of instructions and assessment rubric which is provided to students in the Biodiversity course guide and website. All writing assignments are expected to conform to basic college-level standards of mechanics and presentation.

Grading Policies and Practice

To complete the course, students must fulfill each of the assignments as described in the course and submit them to the instructor by the assigned deadline in the course drop box. In addition, students must participate in the course discussion forum by responding to all instructor requests and by interacting with fellow classmates as instructed.

Turnitin Plagiarism Review of Assignments

Assignments in the Biodiversity course will be sent through the Turnitin plagiarism software. Students must submit their own original work. Work found to be plagiarized **will receive no points.** If a student has plagiarized from a classmate, **both students will receive zero points.** Resubmission of a plagiarized assignment is not permitted. If the instructor determines the plagiarism is egregious the matter will be referred to the University's Academic Integrity Board.

Late Work Policy

Points will be deducted for late work that has not been exempted by the instructor (i.e., for medical or significant personal reasons). Work received later than one week after the deadline will receive 0% credit. Discussion forums will generally be 'locked' one week after the deadline.

Course Grading Scale

Grading Scale	Percentage	Verbal Descriptor
A	100-93%	Excellent
A-	92-90%	
B+ to B-	89-80%	Very Good
C+ to C-	79-69%	Satisfactory
D+ to D-	68-60%	Poor
F	< 60%	Unacceptable

DePaul University Rubric for Letter Grades

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.

Incomplete (IN) Grade: This process follows university [policy](#).

A student who encounters an unusual or unforeseeable circumstance that prevents her/him from completing the course requirements by the end of the term may request a time extension to complete the work.

- The student must formally initiate the request by submitting the [Contract Form](#) (via email, word doc), no later than week 10 (or prior to the final week of a shorter-term course).
- The instructor has discretion to approve or not approve the student's request for an IN grade.
- The instructor has discretion to set the deadline for completion of the work, which may be earlier but no later than two quarters (not counting Summer term).
- The instructor may not enter an IN grade on behalf of a student without a completed and agreed upon contract.
- The student is alerted that IN grades are not considered by Financial Aid as evidence of satisfactory

academic progress.

In order to qualify, the student must have:

1. satisfactory record in the work already completed in the course;
2. encountered unusual or unforeseeable circumstances, which prevent him/her from completing the course requirements before the end of the term; and
3. applied to the instructor and to the Assistant Dean for permission to receive the IN. The incomplete will expire at the end of the following semester. If the work is not complete, the student will receive a failing grade.

Pass/Fail Exclusions

You may not use the [Pass/Fail](#) grading option if you are using this course to meet Liberal Studies Program (LSP) requirements. Likewise, if this course is taken to meet a requirement in your major (including intended and pre-majors), minor, and/or certificate (including intended and pre-minors/certificates) you may not use the Pass/Fail option. You should follow any other guidelines for P/F grades that DePaul permits and discuss these with your academic advisor.

General Assessment Criteria for All Writing Assignments

Consider visiting the Writing Center to discuss your assignments for this course or any others. You may schedule appointments (30 or 50 minutes) on an as-needed or weekly basis, scheduling up to 3 hours' worth of appointments per week. Online services include Feedback-by-Email and IM conferencing (with or without a webcam). All writing center services are *free*.

Writing Center tutors are specially selected and trained graduate and undergraduate students who can help you at almost any stage of your writing. You will not do your work for you, but you can help you focus and develop your ideas, review your drafts, and polish your writing. You can answer questions about grammar, mechanics, different kinds of writing styles, and documentation formats. You also can answer questions and provide feedback online, through IM/webcam chats and email.

The tutors won't necessarily be familiar with every class or subject, but you are able to provide valuable help from the perspective of an interested and careful reader as well as a serious and experienced student-writer. Schedule your appointments with enough time to think about and use the feedback you'll receive. To schedule a Face-to-Face, Written Feedback by Email, or Online Appointment, visit www.depaul.edu/writing.

News Items and Discussion Forums for Online Courses

Discussion Forums are an important component of your online experience. This course contains discussion forums related to the topics you are studying each week. For requirements on your participation in the Discussion Forums, please see "Discussion Forum" and the "Discussion Rubric" in this syllabus.

A Course Q & A discussion forum has also been established to manage necessary, ongoing

social and administrative activities. This is where the management and administrative tasks of the course are conducted, and where you can ask 'process' questions and receive answers throughout the course from the instructor or other students.

Information Area Title	Appropriate Activities
News	Periodically, the instructor may make general postings and updates to course materials (beyond regular updates). This in an area for Biodiversity in the News too.
Forum Title	Appropriate Activities
Introductions	A place to tell us a little about yourself and your connection to the course subject matter.
Course Question and Answers	A place for students to ask process questions about the course activities. Individual questions should be sent directly to the instructor.
Module Discussion Forums	Student interactions and collaboration around current course topics.

Course Policies

Course and Workload Expectations

Workload, Time Management, and Attendance

This online course is not self-paced and requires a regular time commitment each week throughout the quarter. You are required to log in to the course at least three to four times a week so that you can participate in the ongoing course discussions. Online courses are more flexible but no less time consuming than onsite courses. Students will have to dedicate some time every day or at least every second day to their studies. A typical four credit hour onsite course with a lab component at DePaul involves 6 hours of onsite learning. In addition, students can expect to spend at least three to six hours of study and homework per week. Therefore, to work towards an excellent grade in *Biodiversity*, students should expect to commit approximately 10 hours of time spread out through each week of the quarter.

Online Participation Guidelines

All the discussion that would ordinarily take place in a classroom takes place in the Discussion Boards in your online course. Just as you are expected to attend a course scheduled to take place in a classroom, you must attend to your online course, at least three times a week. This is done by going to the Discussion Board area to read what is written there and to contribute to the ongoing discussion. Note: The D2L system permits the instructor to evaluate the participation level of students.

Course Netiquette

Online discussions are an important part of the course experience. To ensure a positive learning environment, students should follow the guidelines below:

- Be polite
- Respect other participants' views or opinions
- Think before you write, and ask yourself if you would say the same thing in person
- Use positive phrases (i.e., "Good idea!" or "Thanks for the suggestions," etc.)
- Be sensitive to cultural differences
- Avoid hostile, curt or sarcastic comments
- No objectionable, sexist, or racist language will be tolerated
- Create a positive online community by offering assistance and support to other participants.
- Use correct grammar and syntax

Instructor's Role

The instructor's role in this course is that of a discussion facilitator and learning advisor. It is not their responsibility to make sure students log in regularly and submit their assignments. The

instructor will read all postings to the general discussion forums but may not choose to respond to each posting. Most often you will receive individualized feedback to assignments through the D2L assessment system.

Office Hours

As this is an online course there will be no set office hours. Office hours will be by appointment. Typically, students will receive a response to emailed or posted queries generally within 48 hours during regular business days. Responses will be usually by e-mail or conference call if prearranged.

Student's Role

Online students must take a proactive approach to the learning. As the course instructor's role is that of a learning guide, the role of the student is that of the leader of their own learning. Students will be managing their own time to assure completion of the readings, activities and assignments for the course. In addition, students are expected to take a more active role in peer learning expressed in the discussion forums.

College and University Policies

This course includes and adheres to the college and university policies described in the links below:

[Undergraduate Academic Policies](#)

[Accommodations Based on the Impact of a Disability](#)

[Protection of Human Research Participants](#)

[APA citation format](#)

Essential Policies for this Course

Academic Integrity Standards

This course abides by DePaul University's Academic Integrity policy. In particular students should avoid cheating and plagiarism as defined below.

1. Cheating. Cheating is any action that violates university norms or instructor guidelines for the preparation and submission of assignments. This includes, but is not limited to: unauthorized access to examination materials prior to the examination itself; use or possession of unauthorized materials during the examination or quiz; having someone take an examination in one's place; copying from another student; unauthorized assistance to another student; or acceptance of such assistance.

2. Plagiarism. Plagiarism occurs when one uses words, ideas, or work products attributed to an identifiable source, without attributing the work to the source from which it was obtained, in a situation where there is a legitimate expectation of original authorship in order to obtain benefit, credit, or gain. Plagiarism includes but is not limited to the following:
 1. The direct copying of any source, such as written and verbal material, computer files, audio disks, video programs or musical scores, whether published or unpublished, in whole or part, without proper acknowledgement that it is someone else's.
 2. Copying of any source in whole or part without proper acknowledgement.
 1. This includes using others' work and;
 2. The reuse or repurposing of any previously submitted version of one's own work-product or data into a "new" product without requesting permission from the current instructor (also known as "self-plagiarism").

Protection of Human Subjects in Research

Demonstrating competence sometimes involves human interactions, including interviewing and or observing people outside of the course, discussing those interactions with class members and reporting on the interactions in written format(s). As such, these interactions qualify as human subjects research and are subject to University and Federal guidelines. Research which takes place in the context of this course is exempt from approval by the School of Continuing and Professional Studies Local Review Board *only under the following conditions*:

1. The data collected is *exclusively* for the purpose of class discussion and may not be used for any other purpose, whether during the course or at any time afterwards. If there is any possibility that the data could be used in further research or for publication, then students must obtain approval from the Local Review Board before beginning.
2. Students assess the risk of harm to the individual, whether physical, mental or social, and ensure that no harm does or could result from interviews, observations, discussion and/or reports.
3. The privacy and confidentiality of those interviewed, observed, or discussed in the course are protected. Unless the student receives written permission from an individual to use the individual's name, all names should be changed or eliminated, ensuring that identity cannot be determined from the data provided.

Written permission can be secured only through an *Informed Consent document*, which your instructor will help you develop, if appropriate. For more information see:

<http://research.depaul.edu/>

Additional Course Resources

[University Center for Writing-based Learning](#)

Dean of Students Office

About the Instructor/Course Author

Kevin F. Downing, Professor – DePaul University

Dr. Downing is a Professor at DePaul University's college for adult learners, the School of Continuing and Professional Studies. His research interests include the investigation of Miocene fossil mammals, Evaluating Ocean Acidification Events (OAE) From Fossil Coral Skeletons, and online science learning practices. He is the author of numerous publications in geology, paleontology and science education and is the co-author of the book, *Online Science Learning: Best Practices and Technologies*. Dr. Downing received B.S. degrees in Astronomy and Geology (University of Illinois-Champaign), an M.S.T. in Geology (University of Florida-Gainesville), and Ph.D. in Geoscience with sub-specialization in Evolutionary Biology and Ecology (University of Arizona, Tucson).

Biodiversity Course Schedule

Mod #	Wk #	Module Title	Discussion Forum Themes	Virtual Fieldtrips and Labs	Readings (Gaston) and Supplemental Readings and Materials	Other Assignments
1	1	Nature of Science	How does uncertainty arise in Science with respect to experiments and measurement?	VFT 1 Virtual Biology Lab Estimating Stream Biodiversity http://virtualbiologylab.org/biodiversity-ecology/	Supplemental: http://undsci.berkeley.edu/teaching/misconceptions.php	Research Paper Start
2	2	Introduction to the Science of Biodiversity	What is Biodiversity and why is it important?	LAB-1 Classification: Sorting Out Life's Variety and its abundance	(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=7tgNamiTRkk	
3	3	The Origin and Evolution of Life	How does life originate and go extinct?	VFT2 Lizard Evolution Virtual Lab http://www.hhmi.org/biointeractive/lizard-evolution-virtual-lab Just the first two modules. Download the worksheet as a guide to the first two modules.	Supplemental: Evolution 101 http://evolution.berkeley.edu/evolutionary/article/evo_01 Origin of Life NOVA video http://www.pbs.org/wgbh/nova/evolution/origins-life.html	Research Hypothesis and Initial References Due
4	4	Biodiversity: The Fossil and Contemporary Record	What does the fossil record indicate about biodiversity and what are the limitations of this information?	LAB-2 Evolution: The Origination and Extinction of Biodiversity	(Chapter 2) Biodiversity Through Time From the Cambrian Explosion to the Great Dying	Self-Directed Fieldtrip Start
5	5	Extinction and Mass Extinction	What is the character of earth's past mass extinction events and how does bear on modern biodiversity?	VFT3 WGBH Video (Firm). (2001). <i>Evolution</i> . #2 & #3 on Extinction https://www.youtube.com/watch?v=L5DaOlpXtmQ	Supplemental: Mass Extinction (K-T Example) https://www.youtube.com/watch?v=trPu5u_Pizk	

				https://www.youtube.com/watch?v=Y4Py6pB8FMI		
6	6	Mapping, Estimating and Evaluating Biodiversity: Habitats and Ecosystems	How do we estimate biodiversity and what are the limitations?	LAB-3 Measuring Biodiversity: Richness and Evenness	(Chapter 3) Mapping Biodiversity Supplemental: Plant Biodiversity (First flower) https://www.youtube.com/watch?v=f7ztfVrFnU	
7	7	Valuing Biodiversity	How can biodiversity be valued from economic and aesthetic perspectives?	VFT4 Using Biofilms to Estimate biodiversity Evaluate: 1) Virtual Samples and 2) Biodiversity at Depth https://www.mdseagrant.org/interactive_lessons/biofilm/index.html	(Chapter 4) Does Biodiversity Matter?	
					Linking Ecology and Economics for Ecosystem Management Supplemental: Environmental Economics https://www.youtube.com/watch?v=dHn_bNfbIIA 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 Method https://www.youtube.com/watch?v=AjcQpziBu1I Avoided Cost Method https://www.youtube.com/watch?v=hOX6WrR79Ao Replacement Cost Method https://www.youtube.com/watch?v=iTW05vFILXY Hedonic Pricing Method https://www.youtube.com/watch?v=LkXVCQam5kw	
8	8	Human Impacts: Threats to Biodiversity	What are the major impacts that humans have on biodiversity?	LAB-4 Biomes and Habitats: Conserving Biodiversity	(Chapter 5) Human Impacts Great Barrier Reef https://www.youtube.com/watch?v=aGGBGcjdjXA	
9	9	Global Perspectives of Biodiversity: Culture & Economy	How do different cultures view biodiversity and its conservation?	VFT5 Conservation Ecology (pick 2 simulations) http://virtualbiol	Supplemental: Meet the Ranchers Who Claim the Brazilian Amazon is Theirs to Burn https://www.youtube.com/watch?v=	Self-directed Field tip Due

				ogylab.org/conservation-ecology/	=TclJUSMiKQyY Conservation and the race to save biodiversity https://www.youtube.com/watch?v=2RC3Hsk90t8	
10	10 & 11	Conserving and Sustaining Biodiversity	What are chief ways of sustaining biodiversity? What is the role of biodiversity in your life and your plans to interact with and sustain biodiversity?	LAB-5 Valuing Biodiversity: Biodiversity and Geopolitics: Sustainable growth and Biodiversity Treaty Exercise	(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	Research Paper Due

Appendix I - Additional Resources

Useful Video Resources:

Attenborough, D. (2009). *Charles Darwin and the tree of life*. UK: BBC 1.

Bassler, B. L., Olivera, B. M., Wilson, E. O., Chivian, E., & Howard Hughes Medical Institute. (2010). *Exploring biodiversity: The search for new medicines*. Chevy Chase, Md: Howard Hughes Medical Institute.

Carroll, S. B., Carroll, S. B., WGBH (Television station: Boston, Mass.), & PBS Distribution (Firm). (2010). *What Darwin never knew*. Arlington, Va.?: Distributed by PBS Distribution.

Djoghla, A., Steiner, A., Marton-Lefevre, J., Ki-moon, B., & Secretariat of the Convention on Biological Diversity. (2010). *International Year of Biodiversity 2010*. Montreal: Secretariat of the Convention on Biological Diversity.

Espar, D., Lewis, S. K., Olicker, J., Schmidt, C., Churchill, K., Hutton, R., Willumsen, G., ... WGBH Video (Firm). (2001). *Evolution*. South Burlington, Vt: WGBH Boston Video.

Fothergill, A., Attenborough, D., British Broadcasting Corporation., & Discovery Channel (Firm). (2012). *The planet collection*. London: British Broadcasting Corporation.

Holmes, M., Gunton, M., Attenborough, D., Fenton, G., British Broadcasting Corporation., Discovery Channel (Firm), Skai Television., ... Warner Home Video (Firm). (2010). *Life*.

Kelly, K., McCullough, C., India., & WGBH (Television station : Boston, Mass.),. (2013). *Remnants of Eden*.

Weiner, M., Weiner, H., Damon, M., Screenscope, inc., & South Carolina Educational Television Network. (2009). *Journey to planet Earth*. Washington, D.C.: Screenscope, inc.

Additional Useful Literature Resources:

Assessment, M. E. (2005). Ecosystems and human well-being: wetlands and water. *World resources institute, Washington, DC*, 5.
http://millenniumassessment.org/documents/MA_wetlands%26water-Chinese.pdf

Eichhorn, M. P. (2016). *Natural systems: The organization of life*. Wiley-Blackwell; 1 edition (May 2, 2016)

Groombridge, B. (1992). *Global biodiversity: status of the earth's living resources*. Chapman & Hall.

- Habel, J. C., Rasche, L., Schneider, U. A., Engler, J. O., Schmid, E., Rödder, D., ... & Lens, L. (2019). Final countdown for biodiversity hotspots. *Conservation Letters*, e12668.
<https://conbio.onlinelibrary.wiley.com/doi/pdf/10.1111/conl.12668>
- Magurran, A. E., & McGill, B. J. (Eds.). (2011). *Biological diversity: frontiers in measurement and assessment*. Oxford University Press.
- National Forum on BioDiversity, Wilson, E. O., Peter, F. M., National Academy of Sciences (U.S.), & Smithsonian Institution. (1988). *Biodiversity*. Washington, D.C: National Academy Press..
- Perlman, D. J., & Adelson, G. (2009). *Biodiversity: exploring values and priorities in conservation*. John Wiley & Sons.
- Raven, P. H., Gereau, R. E., Phillipson, P. B., Chatelain, C., Jenkins, C. N., & Ulloa, C. U. (2020). The distribution of biodiversity richness in the tropics. *Science Advances*, 6(37), eabc6228.
<https://advances.sciencemag.org/content/6/37/eabc6228/tab-pdf>
- Reaka-Kudla, M. L., Wilson, D. E., & Wilson, E. O. (1997). *Biodiversity II: Understanding and protecting our biological resources*. Washington, D.C: Joseph Henry Press.
- Root, T. L., Hall, K. R., Herzog, M. P., & Howell, C. A. (Eds.). (2015). *Biodiversity in a changing climate: linking science and management in conservation*. Univ of California Press.
- Sala, E., Mayorga, J., Bradley, D., Cabral, R. B., Atwood, T. B., Auber, A., ... & Lubchenco, J. (2021). Protecting the global ocean for biodiversity, food and climate. *Nature*, 592(7854), 397-402.
<https://archimer.ifremer.fr/doc/00686/79809/82604.pdf>