

GEOGRAPHY AND ENVIRONMENTAL STUDIES
Carleton University

COURSE OUTLINE – Fall 2015
(Updated Sept 9, 2015)

- COURSE:** **Principles of Biogeography - GEOG 3104A**
also listed as BIOL 3608A
- INSTRUCTOR:** **Joshua Thienpont, PhD**
Room B340, Loeb Building
Email: joshua.thienpont@carleton.ca
Phone: 613-520-2600 x8741
Twitter: @JThienpont
- OFFICE HOURS:** Wednesday 11:30 – 12:30
Any other time by appointment only
(I am located primarily at uOttawa)
- PREREQUISITES:** GEOG 1010, BIOL 2600, or permission of the department
- LECTURES:** Monday and Wednesday 10:05 – 11:25
Tory Building Room 342 (Tentative)
- LABORATORY:** Lab A01 – Wednesday 11:35 – 13:25 Loeb A410
Lab A02 – Tuesday 14:35 – 16:25 Loeb A410
Lab A03 – Friday 9:35 – 11:25 Loeb A410

COURSE DESCRIPTION:

Contemporary and past controls on distribution of plants and animals at global, regional and local scales; significance of these distributions.

(from Carleton University, Undergraduate Calendar)

In the broadest sense, biogeography is the study of the distribution of organisms (also biomes, ecosystems, etc.) through space and time. In order to understand this diverse and fascinating subject an introductory course such as this must draw on a wide range of scientific disciplines including ecology, evolutionary biology, genetics, taxonomy, geology, paleoecology, and climatology. As such this course will be of interest to a wide variety of students from biology, geography and the earth sciences. The study of biogeography may be approached from a number of perspectives. Ecological biogeography emphasizes processes occurring over short temporal and limited spatial scales. Historical biogeography is concerned with evolutionary processes taking place over millions of years on a global scale. This course will present the basic concepts and theories that are fundamental to biogeography, over a broad range of temporal and spatial scales.

COURSE OBJECTIVES:

The aim of this course is to provide students with a thorough understanding of the exciting field of biogeography. By the end of the course students will:

1. Understand the complex interactions between ecological and evolutionary factors that control the distribution of organisms in the modern landscape.
2. Identify how evolutionary and climatic factors have shaped the distribution of organisms over geologic time, and led to the modern distribution of biota.
3. Gain an appreciation of the wide range of topics currently being studied by biogeographers.
4. Develop critical skills in the design of biogeographic sampling, analyses of primary data and dissemination of research results.
5. Be able to place the basic principles of biogeography in the context of the rapidly changing environment we find ourselves in.

CuLEARN:

GEOG3104 / BIOL3608 will have an active CuLearn environment that will be your primary hub for all information related to the course, including lecture and lab material, discussion boards, and readings required weekly for classes. Please check CuLearn regularly for the most up to date course information and news. In particular, I strongly encourage you to use the discussion board to ask/answer questions of your peers, establish study groups and discuss your favourite topics in biogeography.

TEXTBOOK/READINGS:

Unlike in previous years, there is no required textbook for *Principles of Biogeography* in 2015. Material presented in lecture will be drawn from, among many other sources, the MacDonald (2003) textbook listed below, but you do not necessarily require a copy of this book in order to supplement the lecture material. This title will be available at the library on reserve, if you wish to use it. I have listed two textbooks (as well as other pertinent titles) that would serve as excellent references to have in your own personal scientific collection, if you so choose. All of these works are available online, and there are likely used copies of the MacDonald (2003) textbook available from previous years.

While there is no required textbook, this year the quantity and breadth of supplementary readings will be greater than in previous iterations of the course. There is a great, and rapidly growing body of literature available related to biogeography (I suggest you peruse the latest issue of the *Journal of Biogeography* if you are in doubt). I encourage you to read as widely as you wish about the topics we cover during the term. At regular intervals I will direct your attention to material that will be important for the laboratory component of the class, as well as directed discussions and self-directed learning, which will take place regularly in the Wednesday “lecture” slot.

Suggested reference textbooks:

MacDonald GM (2003) *Biogeography: Space, Time and Life*. John Wiley and Sons, Inc. ISBN 9780471241935

Cox CB, Moore PD (2010) *Biogeography: An Ecological and Evolutionary Approach*. John Wiley and Sons, Inc.
ISBN 9780470637944

Other recommended reading:

Stager JC (2011) *Deep Future: The Next 100,000 Years of Life on Earth*. Thomas Dunne Books.
ISBN 9780312614638

LECTURES:

Principles of biogeography will consist of two lecture slots per week, on Monday and Wednesday from 10:05 – 11:25 in Tory Building Room 342. Note this location is tentative, and may be rescheduled in advance of the beginning of term. Be sure to check CuLearn and your course calendar for the final assigned room. It is important to note that the topics covered in lecture, as well as the material that will be discussed in the Wednesday time slot, build on one another, and thus it is essential that you do your best to not miss any class meetings. If you must miss a lecture, it is your responsibility to catch up immediately, or you may fall behind. As part of your mark is determined by your participation in the directed discussions that will occur on most Wednesdays, it is essential that you make every attempt to be present for, and actively engaged in, every class.

EVALUATION:

Participation / In-lecture activities	20%
Laboratory exercises	30%
Midterm Exam (Date: Wed Oct 14)	20%
Final Exam	<u>30%</u>
	100%

Examinations:

An in-class midterm, making up 20% of your grade, will take place on October 14th, in the regular lecture room. A formal final examination, constituting 30% of your final grade will take place during the scheduled University exam period. The date of the final exam will be announced in class and posted to CuLearn once it has been established by the University.

Standing in a course is determined by the course instructor subject to the approval of the Faculty Dean. This means that grades submitted by the instructor may be subject to revision. No grades are final until they have been approved by the Dean.

In-Lecture Activities and Participation:

A substantial component of your final mark (20%) will be based on participation in the course. Participation can occur in many forms. Using the CuLearn discussion boards to post interesting information you read about biogeography or answering the questions of your peers, or sending information to me about neat articles or information which I can re-post to CuLearn or incorporate into lectures, as well as interactions in class will count towards these marks. In particular, the majority (~1 hour) of most Wednesday’s “lecture” slot will be dedicated to a variety of in-lecture activities. These will vary greatly throughout the term, but will incorporate discussion of assigned reading material (in both small(er) groups and as a class) as well as

interactive mini-assignments (to be completed within the class period). The purpose of these activities is to allow students to interact with, contemplate and discuss the complex and interacting topics that are essential to a complete training in biogeography, and which may be less suited to traditional lectures. The specifics for a given week will depend on the topics being presented in that portion of the course.

Laboratory Exercises:

The laboratory component of BIOL 3608/GEOG 3104 will be used to facilitate the development of critical scientific skills such as experimental design, statistical analysis and scientific writing. Throughout the term there will be 6 lab sessions (thus there is not a lab every week and it is your responsibility to ensure you know which weeks you must show up). Not every lab will have a component that needs to be handed in, and so formal marks will not accompany every lab. However, the labs that lack specific assignments will be essential for acquiring the necessary skills and data needed in order to complete your projects satisfactorily. Check CuLearn regularly for information and updates relating to the lab component of the course.

Lab 1 – Introduction to labs / sampling plant distribution across Carleton campus

Lab 2 – Analyses of plant distribution data and introduction to the major project

Lab 3 – Ottawa plant biogeography assignment – study design and demonstrator feedback

Lab 4 – Ottawa plant biogeography assignment – statistical analysis and report requirements

Lab 5 – Island biogeography laboratory part 1

Lab 6 – Island biogeography laboratory part 2

The keystone laboratory project for *Principles of Biogeography* is the “Ottawa Plant Biogeography Assignment.” This assignment will be carried out over several weeks of class as a semi-directed project. You will design a biogeographic experiment and formulate a testable hypothesis, carry out the data collection and statistical analyses, and write up your findings. The formal report will be due at the start of Lab 5 (see below for dates). This report is worth 20% of your final mark (equivalent to the course midterm), and as such we expect a high quality of work. However; do not worry, there will be a number of sessions dedicated to developing the skills needed to excel at the assignment.

The island biogeography laboratory will occupy two lab periods, and will include a “table top” sampling program, as well as the analyses of the data generated, and the submission of a report worth 10% of your final grade.

Students are expected to hand in all assignments on time. Late assignments will be penalized 10% of the total grade per calendar day (e.g. If an assignment is marked out of 30, a late assignment will be penalized 3 marks per calendar day). As assignments will be uploaded to CuLearn, weekends will count as two separate days late.

ACADEMIC ACCOMMODATION

You may need special arrangements to meet your academic obligations during the term. For an accommodation request the processes are as follows:

PREGNANCY OR RELIGIOUS OBLIGATION:

Write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details visit the Equity Services website http://www.carleton.ca/equity/accommodation/student_guide.htm

STUDENTS WITH DISABILITIES:

The Paul Menton Centre for Students with Disabilities (PMC) provides services to students with Learning Disabilities (LD), psychiatric/mental health disabilities, Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD), chronic medical conditions, and impairments in mobility, hearing, and vision. If you have a disability requiring academic accommodations in this course, please contact PMC at 613-520-6608 or pmc@carleton.ca for a formal evaluation. If you are already registered with the PMC, contact your PMC coordinator to send me your Letter of Accommodation at the beginning of the term, and no later than two weeks before the first in-class scheduled test or exam requiring accommodation (if applicable). After requesting accommodation from PMC, meet with me to ensure accommodation arrangements are made. Please consult the PMC website for the deadline to request accommodations for the formally-scheduled exam (if applicable).

PLAGIARISM

The University Senate defines plagiarism as “presenting, whether intentionally or not, the ideas, expression of ideas or work of others as one’s own.” This can include:

- reproducing or paraphrasing portions of someone else’s published or unpublished material, regardless of the source, and presenting these as one’s own without proper citation or reference to the original source;
- submitting a take-home examination, essay, laboratory report or other assignment written, in whole or in part, by someone else;
- using ideas or direct, verbatim quotations, or paraphrased material, concepts, or ideas without appropriate acknowledgment in any academic assignment;
- using another’s data or research findings;
- failing to acknowledge sources through the use of proper citations when using another’s works and/or failing to use quotation marks;
- handing in "substantially the same piece of work for academic credit more than once without prior written permission of the course instructor in which the submission occurs."

Plagiarism is a serious offence which cannot be resolved directly with the course instructor. A rigorous investigation is conducted by the Office of the Faculty Dean, including an interview with the student, when an instructor suspects a piece of work has been plagiarized. Penalties are not trivial. (see: <http://www2.carleton.ca/studentaffairs/academic-integrity> and <http://www.library.carleton.ca/howdoI/plagiarism.html>)

Other Important Locations on Campus:

Paul Menton Centre (500 Unicentre) for students needing accommodation

Academic Writing Centre and Writing Tutorial Service (4th Floor, Library, 613-520-6632)

Student Academic Success Centre (SASC, 302 Tory, 613-520-7850)

The Learning Commons (4th Floor, Library, 613-520-2600, ext.1125)

Useful Safety Websites:

Carleton Foot Patrol: www.cusaonline.com/footpatrol

Carleton Safety Programs: www.carleton.ca/safety/programs/index.html

Carleton Working After Hours Program Brochure:

www.carleton.ca/safety/publications/_pdfs/Working-After-Hours.pdf

TENTATIVE CLASS SCHEDULE AND WEEKLY TOPICS
(Subject to modification)

Lectures	Lab	Topic
Wed Sept 2		<ul style="list-style-type: none"> • Course Introduction
Fri Sept 4		<ul style="list-style-type: none"> • Introduction to Biogeography
Mon Sept 7		Labour Day, no class
Wed Sept 9		<ul style="list-style-type: none"> • Abiotic controls on distribution
Sept 14/16	Lab 1 (T/W/F)	<ul style="list-style-type: none"> • Biotic controls on distribution
Sept 21/23	Lab 2 (T/W/F)	<ul style="list-style-type: none"> • Disturbance and succession
Sept 28/30		<ul style="list-style-type: none"> • The role of fire in (Canadian) biogeography
Oct 5/7	Lab 3 (T/W/F)	<ul style="list-style-type: none"> • Dispersal, immigration, invasion and habitat loss
Mon Oct 12	Lab 4 (T/W/F)	Thanksgiving Day, no class
Wed Oct 14		Midterm Exam
Oct 19/21		<ul style="list-style-type: none"> • Island biogeography
Oct 26/28		Fall Term Break; No Class
Nov 2/4		<ul style="list-style-type: none"> • Fragmentation and conservation
Nov 9/11	Lab 5, <i>Plant biogeography study due</i> (T/W/F)	<ul style="list-style-type: none"> • Historical patterns and processes: change across geologic time
Nov 16/18	Lab 6 (T/W/F)	<ul style="list-style-type: none"> • Evolution and speciation
Nov 23/25		<ul style="list-style-type: none"> • The fossil record and extinction
Nov 30/ Dec 2		<ul style="list-style-type: none"> • Future biogeography and global change
Dec 7		<ul style="list-style-type: none"> • Final thoughts / review
Dec 10-22		University Exam Period