GEOB 407: Vegetation dynamics: disturbance, climate and human impacts TERM 2: SPRING 2015

LECTURE: Tuesdays & Thursdays, GEOG 215, 2:00 – 2:50 PM
LAB SECTION: Thursdays, GEOG 215, 3 – 4:50 pm (*note that the schedule on Thursdays will be flexible, and that on some days the lecture will run into lab & vice versa*)
Instructor: Alison Cassidy, PhD Candidate, *alison.cassidy@geog.ubc.ca*
Office hours: by appointment (Geography 210F)

Teaching Assistant: Deirdre Loughnan

Course Description: This course will investigate vegetation dynamics and the impacts of disturbance (both anthropogenic and natural) and global environmental change, by integrating current research and theory. The first half of the course will focus on plant invasions and the conservation of rare and threatened plant species and will include learning how to build simple mathematical models. Disturbance ecology and modifications to ecosystem structure and function will be explored during the second half of the course. Students will learn to interpret and critique scientific analyses and results. In addition, weekly laboratory exercises will allow students to collect data, learn to analyze them, and interpret the results using the R programming language. A background in statistics and ecology is therefore recommended.

Prerequisites: GEOB 207 OR BIOL 304 or 306 OR FRST 201. At least one course, and ideally two or three, in math and/or statistics and/or GIS will help with success in this course.

Course objectives:

- Develop ability to read, critically evaluate and discuss the primary scientific literature.
- Assess how ecological theory can help us describe and understand the population
  dynamics and spatial extent of rare and invasive plant species.
- Examine the impacts of disturbance on ecosystem structure and function.
- Use mathematical models (in R) to describe population dynamics, spatial spread,

and vegetation change, and provide a clear interpretation of the results.

Course website: http://elearning.ubc.ca/connect/ (C*ontains all course information, as well as*
discussion boards. FAQs will be addressed here.)

Textbook: The primary reference material will be a series of papers posted on Connect (required reading). You may also find it helpful to refer to a basic ecology textbook (I recommend *Ecology* (2nd edition, 2012), by Cain, Bowman & Hacker, if you don't have one. It will be on reserve in the GIC.). For some topics, reference book chapters or papers will be available on the course website.

Course structure & evaluation: The course includes regular lectures, discussions of readings, lab assignments and an independent project.

1. READINGS & DISCUSSIONS: each week, one or two readings drawn from the primary literature will be assigned, and we will have a discussion of them. Papers will be posted on the course website, and the date of the discussion (typically Thursday) is listed on the course schedule. By 9 pm on the day before the discussion, students must submit 2 questions for discussion on the appropriate forum on Connect. 10% of the final grade will be based on questions submitted and participation during discussions.

LEAD DISCUSSION: After the first week, students will sign up to lead a discussion in pairs. Student leaders will have access to discussion questions submitted by their peers, but they
must submit discussion questions to me via email at least two days beforehand (and are encouraged to come to office hours in advance to ask questions about the paper). After the in-class discussion, each student leader must submit a one-page (single spaced) paper summarizing the paper and the class discussion. Leading one discussion and writing one summary paper will together be worth 10% of the final grade.

2. ASSIGNMENTS: During the first part of the term, there will be weekly lab assignments, which will be passed out (or available to download on Connect). They will be *due one week after being handed out* (at the beginning of class on Thursdays). Students may collaborate during analyses, but must hand in independently written reports. A late penalty of 10% per day will be applied to late work. Most of the assignments will require you to spend ~ 2 hours outside of lab to finish them. If you are spending more time than this, please ask for help.

3. INDEPENDENT PROJECT: The project is a chance for students to explore a topic of their choice within the field of disturbance ecology. More details will be provided on the project in class.

Final grades will be determined as follows:

Participation in discussions	10%
Lead a discussion & summary	10%
Assignments	40%
Independent project	40%
TOTAL	100%

***Expectations of students**:* Due dates for the assignments & project are fixed, and all assignments are due at the beginning of class on the due date, unless otherwise noted. Late assignments will be assessed a penalty of 10% per day. Extensions will not be granted, except for documented medical or compassionate reasons. *Regarding academic honesty*: plagiarism and cheating may be punished by failure of the assignment or course. Projects or assignments cannot be submitted for more than one course without obtaining prior permission of both instructors.

Getting started in R: R is an open source computer language. Open source means lots of people contribute to writing the source code, and the source code is available; it also means it's free to download and use! You can use it plot, manipulate and analyze all kinds of data. Before you come to lab on January 16, when we'll start with a tutorial, you should download and install two pieces of software onto your computer: base R (http://cran.r-project.org/) and RStudio (http://www.rstudio.com/ide/download/), which is an interface that looks the same on all computer platforms.

Don't be intimidated by needing to write lines of code to get output instead of using a graphical interface (GUI). For the most part, you will be running code already written, so your main tasks will be to adjust particular lines to generate the appropriate outputs, and interpret them.