

MEMO

Attention: Sean Markey, Assoc. Dean, Faculty of Environment

From: Geoff Mann, Dept. of Geography, Graduate Program Chair

Re: New Course Proposal: GEOG 618, Advanced Conservation Biogeography

Memo Date: 5 February 2013

Dear Sean,

Attached, please find a new course proposal for the Geography graduate program in the 2013/2014 Calendar. The course is GEOG 618 (Advanced Conservation Biogeography). This proposal has been approved by the Geography Graduate Studies Committee, and by the Department of Geography on 10 January 2013.

The new course is proposed as part of the long-term teaching plans of the newest member of the Geography faculty, Dr. Meg Krawchuk. Minor modification of existing courses could not adequately capture Dr. Krawchuk's areas of teaching and research expertise; hence the need for a new course.

I would ask that, after the necessary preliminaries, you could please bring the proposed addition to the Faculty of Environment Curriculum Committee for approval. Thanks very much in advance for your time.

Geoff



Geoff Mann
Associate Professor
Graduate Program Chair

New Graduate Course Proposal Form

PROPOSED COURSE

Subject [eg. MAPH] GEOG	Number [eg. 810] 618	Units [eg. 4] 4
Course Title [max 80 characters] Advanced Conservation Biogeography		
Short Title [appears on transcripts, max 25 characters] Advanced Biogeography		
Course Description for SFU Calendar ☐ see attached document ☐ Learning outcomes identified A survey of advanced biogeographic theory related to biodiversity conservation. Particular focus on quantitative tools used in the discipline.		
Available Course Components: ☒ Lecture ☐ Seminar ☒ Laboratory ☐ Practicum ☐ Online ☐ _____		
Grading Basis ☒ Letter grades ☐ Satisfactory/Unsatisfactory ☐ In Progress/Complete		This is a capstone course ☐ Yes ☒ No
Prerequisites (if any) ☒ see attached document (if more space is required)		
☒ This proposed course is combined with an undergrad course: Course number and units: <u>GEOG 415 - 4</u>		
Additional course requirements for graduate students ☐ See attached document (if this space is insufficient) Graduate students must complete an additional project using quantitative methods learned in lab.		
Campus at which course will be offered (check all that apply) ☒ Burnaby ☐ Vancouver ☐ Surrey ☐ GNW ☐ _____		
Estimated enrolment 6	Date of initial offering January 2013	Course delivery [eg. 3 hrs/week for 13 weeks] 2-hr lecture + 2-hr lab
☐ Yes ☒ No Practicum work done in this class will involve children or vulnerable adults (If the "Yes" box is checked, all students will require criminal record checks)		
Justification ☐ See attached document (if more space is required) This course reflects a change in faculty.		

RESOURCES

If additional resources are required to offer this course, the department proposing the course should be prepared to provide information on the source(s) of those additional resources.

Faculty member(s) who will normally teach this course ☐ information about their competency to teach the course is appended Meg Krawchuk
Number of additional faculty members required in order to offer this course 0
Additional space required in order to offer this course ☐ see attached document 0 This will be offered in association with GEOG 415
Additional specialized equipment required in order to offer this course ☐ see attached document This course will use existing computer lab space
Additional Library resources required (append details) ☐ Annually \$_____ ☐ One-time \$_____ none.

PROPOSED COURSE from first page

Program (eg. MAPH) GEOG	Number (eg. 810) 618	Units (eg. 4) 4
Course title (max 80 characters) Advanced Conservation Biogeography		

APPROVAL SIGNATURES

When a department proposes a new course it must first be sent to the chairs of each faculty graduate program committee where there might be an overlap in course content. The chairs will indicate that overlap concerns have been dealt with by signing the appropriate space or via a separate memo or e-mail (attached to this form).

The new course proposal must also be sent to the Library for a report on library resources.

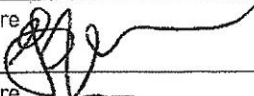
Once overlap concerns have been dealt with, signatures indicate approval by the department, home faculty and Senate Graduate Studies Committee.

Other Faculties

The signature(s) below indicate that the Dean(s) or designate of other Faculties affected by the proposed new course support(s) the approval of the new course.

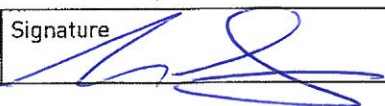
Name of Faculty	Signature of Dean or Designate	Date

Departmental Approval (non-departmentalized faculties need not sign)

Department Graduate Program Committee Geoff Mann	Signature 	Date 5/2/2013
Department Chair Nick Blomley	Signature 	Date 7/2/13

Faculty Approval

Faculty approval indicates that all the necessary course content and overlap concerns have been resolved, and that the Faculty/Department commits to providing the required Library funds and any other necessary resources.

Faculty Graduate Program Committee Sean Markay	Signature 	Date 12/2/13
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Senate Graduate Studies Committee Approval

SGSC approval indicates that the Library report has been seen, and all resource issues dealt with. Once approved, new course proposals are sent to Senate for information.

Senate Graduate Studies Committee	Signature	Date
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CONTACT

Upon approval of the course, the Office of the Dean of Graduate Studies will consult with the department or school regarding other course attributes that may be required to enable the proper entry of the new course in the student record system.

Department / School / Program	Contact name	Contact email
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GEOG 618 Advanced Conservation Biogeography

Meg Krawchuk, Assistant Professor, Department of Geography
meg_krawchuk@sfu.ca

COURSE DESCRIPTION

Conservation biogeography is the application of biogeographic principles to the science of species conservation. This course will provide a survey of advanced theory and techniques used in conservation biogeography in terrestrial ecosystems and provide students with a background to facilitate future study or work in environmental conservation. The assessment of many of our world's environmental challenges benefits from taking a broad, regional or global view, with an explicit spatial perspective - a biogeographic outlook. We will focus on ecological and conservation biogeography with a goal to develop an understanding of how these biogeographic perspectives contribute to conservation science in the face of land cover and global climate change. Classes time will involve a two-hour seminar period and a two-hour laboratory period where students will learn to use quantitative tools applicable to advanced conservation biogeography such as GIS, reserve design software, and the R statistical language. We will use Canada's boreal biome as a model system for understanding these conservation challenges but also touch on other regions of the world.

Objectives:

- a. Develop our understanding of basic principles in biogeography
- b. Explore the role of biogeography in biodiversity conservation
- c. Understand uncertainty involved in biodiversity mapping, modelling, and decision making
- d. Improve our ability to communicate scientific ideas through writing, analysis, and presentation
- e. Gain familiarity with application of conservation biogeography in Canada's boreal forests

Course materials: Text can be purchased at the bookstore: Ladle, R.J. and Whittaker, R.J. 2011. Conservation Biogeography. Wiley-Blackwell. A copy of the text will be on reserve at the library.

Prerequisites: Registered in a graduate program in Geography or Biological Sciences

COURSE STRUCTURE

Seminar: The structure of seminar time will reflect two of the goals of this course: to encourage students to develop their oral communication skills, and discuss current controversies in conservation. Accordingly, seminar will be divided into three components: 1) teaching lecture, 2) student-led lecture, and 3) class discussion.

1) Teaching lecture. I will lecture for 30 minutes at the beginning of class, touching on general principles relevant to the day's topic area.

2) Student-led lecture. Each student in the class will be responsible for preparing one 30-minute mini-lecture summarizing content, theory, technique, and criticism of research papers assigned as readings for the class in a given week and one additional paper identified as relevant by the student. The assigned reading is posted on the class website. You may also work in pairs to provide a 40-50 minute lecture. The lecture should end with a minimum of three questions to start-up discussion with the class.

3) Class discussion. The remainder of seminar will involve discussion of topics addressed in the teaching lecture and student-led lecture. Note, all students are responsible for reading the assigned materials in advance of class in preparation for discussion.

Lab:

Labs are scheduled each week and include short assignments. In addition you will write a short research paper based on a mini-project developed from one of the laboratory exercises. This project will include development, and application of the laboratory tool to a conservation problem of your choice. The focus can include the topic of your dissertation, but may also explore new ground. The research paper must demonstrate the creative use of the laboratory tool to address a question related to conservation biogeography and follow a short two page Science-style journal writing framework. You'll present a short 5-minute talk on your project in the last two weeks of term.

Written review paper:

The goal of the review paper is to allow each student to examine a topic in conservation biogeography in greater depth than covered in class. The written review will be presented as a 10-minute summary in the last weeks of class. This topic can include readings/topics from your mini-lecture.

Marks:

Student-led lecture: 25%

Class participation: 15%

Review paper 35%, including a short presentation to class (5%)

Lab assignments and mini-project: 20%

Lecture topics and scheduling

Lecture	Topic
1	Introduction to conservation biogeography
2	Species, biodiversity, biogeography
3	Canada's boreal: a test case
4	Land cover change: habitat loss and fragmentation, valuing biodiversity
5	Land cover change: invasions, the loss of biogeography
	NO CLASS: Reading week
6	Patchy patterns: island biogeography and meta-populations
7	Natural disturbance gradients in the context of conservation biogeography: fire and insects
8	Theory and recent models of ecological niches & distributions; neutral theory of biodiversity and niche theory
9	Protected areas and notions of conservation: protected areas and mixed-use planning
10	Systematic conservation planning: reserve planning and aquatic applications of reserve design
11	Beyond protected areas: the matrix and sustainable landscapes
12	Climate change and conservation biogeography
13	Studies in contrast: different ideas for different landscapes

Lab topics and scheduling

Lab	topic	Assignments
	No lab this week	
1	Global data in GIS	Assgn. 1: Ecoregions
2	Exploring the boreal using ArcGIS	
3	GoogleEarth	
4	R: an introduction for pirates	
5	R as a GIS – the raster package	Assgn. 2: Biome plot
	NO LAB: READING WEEK	
6	Discussion of review papers in lab: Outline and introduction	
7	R: species distribution models	Assgn 3: Predictive maps
8	Sandbox working time	
9	Campus tree walk & biodiversity metrics	Assgn 4: Tree map
10	Marxan	Assgn 5: Reserves
11	More on reserve design	
12	R: climate projections and SDMs	

Readings: L&W indicates Ladle and Whittaker's Conservation Biogeography.

Lecture 1: Introduction to Conservation Biogeography:

L&W Preface, Chptr. 1, Chptr. 2; Bradshaw et al. (2010)

Lecture 2: Species, biodiversity, biogeography

L&W Chptr.3, Chptr. 4; Ehrlich & Ehrlich (1992); Jenkins & Ricklefs (2011)

Lecture 3: Canada's boreal forest, a test case

Bradshaw et al (2009); Cardillo et al (2006)

Lecture 4.

National Film Board documentary on Canada's National Parks, E.O. Wilson's TED talk

Lecture 5: Landcover change, habitat loss, fragmentation, invasions

L&W Chptr. 9; Saunders et al (1991) + readings for student mini-lectures

Lecture 6: Patchy patterns: island biogeography, meta-populations.

L&W Chptr. 8; Diamond (1975) + readings for student mini-lectures

Lecture 7: Natural disturbance gradients in the context of conservation biogeography.

Pickett & Thompson (1978); Shlisky et al (2007) + readings for student mini-lectures

Lecture 8: Theory and recent models of ecological niches & communities

Wiens (2011); Rosindell et al (2011) + readings for student mini-lectures

Lecture 9: Protected areas and notions of conservation

L&W Chptr. 5 and review Chptr. 2; Brooks et al (2006)+ readings for student mini-lectures

Lecture 10: Systematic conservation planning

L&W Chptr. 6; Margules & Pressey (2000) + readings for student mini-lectures

Lecture 11: Beyond protected areas, the matrix and sustainability

DeFries et al (2010); Franklin (1993)

Lecture 12: Climate change and conservation biogeography

L&W Chptr. 7; Heller et al (2009); Willis & MacDonald (2011)

Lecture 13: Studies in contrast

L&W 10; Grumbine & Xu (2011) , Wiens et al (2011); Bond & Parr (2010)