



ORIGINAL COURSE IMPLEMENTATION DATE: September 2012  
 REVISED COURSE IMPLEMENTATION DATE: January 2017  
 COURSE TO BE REVIEWED: (six years after UEC approval) November 2021  
 Course outline form version: 09/15/14

## OFFICIAL UNDERGRADUATE COURSE OUTLINE FORM

Note: The University reserves the right to amend course outlines as needed without notice.

<b>Course Code and Number:</b> GEOG 419	<b>Number of Credits:</b> 4 <a href="#">Course credit policy (105)</a>																
<b>Course Full Title:</b> Paleoeology																	
<b>Course Short Title (if title exceeds 30 characters):</b>																	
<b>Faculty:</b> Faculty of Science	<b>Department (or program if no department):</b> Geography and the Environment																
<b>Calendar Description:</b> <p>Paleoeology is the study of past environments through the use of fossils, geochemistry, and radiometric dating. During this course you will learn how to reconstruct past environmental change driven by climate, sea-level change, earthquakes, floods, and fire. Field trips outside of class time are required.</p> <p>Note: This course is offered as GEOG 419 and BIO 419. Students may take only one of these for credit.</p>																	
<b>Prerequisites (or NONE):</b>	One of the following: GEOG 302, GEOG 303, GEOG 304, GEOG 307, GEOG 308, GEOG 315, GEOG 319, GEOG 335, BIO 301, BIO 305, BIO 306, BIO 307, BIO 308, BIO 310, BIO 330, BIO 335, BIO 340, BIO 360, or BIO 370.																
<b>Corequisites (if applicable, or NONE):</b>																	
<b>Pre/corequisites (if applicable, or NONE):</b>																	
<b>Equivalent Courses (cannot be taken for additional credit)</b> Former course code/number: Cross-listed with: BIO 419 Equivalent course(s): BIO 419, GEOG 400H <i>Note: Equivalent course(s) should be included in the calendar description by way of a note that students with credit for the equivalent course(s) cannot take this course for further credit.</i>	<b>Transfer Credit</b> Transfer credit already exists: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Transfer credit requested (OReg to submit to BCCAT): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (if yes, fill in transfer credit form) Resubmit revised outline for articulation: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No To find out how this course transfers, see <a href="http://bctransferguide.ca">bctransferguide.ca</a> .																
<b>Total Hours: 75</b> <b>Typical structure of instructional hours:</b> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <tr><td>Lecture hours</td><td style="text-align: right;">26</td></tr> <tr><td>Seminars/tutorials/workshops</td><td style="text-align: right;">15</td></tr> <tr><td>Laboratory hours</td><td style="text-align: right;">15</td></tr> <tr><td>Field experience hours</td><td style="text-align: right;">4</td></tr> <tr><td>Experiential (practicum, internship, etc.)</td><td></td></tr> <tr><td>Online learning activities</td><td style="text-align: right;">15</td></tr> <tr><td>Other contact hours:</td><td></td></tr> <tr><td style="text-align: right;"><b>Total</b></td><td style="text-align: right;"><b>75</b></td></tr> </table>	Lecture hours	26	Seminars/tutorials/workshops	15	Laboratory hours	15	Field experience hours	4	Experiential (practicum, internship, etc.)		Online learning activities	15	Other contact hours:		<b>Total</b>	<b>75</b>	<b>Special Topics</b> Will the course be offered with different topics? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, different lettered courses may be taken for credit: <input type="checkbox"/> No <input type="checkbox"/> Yes, repeat(s) <input type="checkbox"/> Yes, no limit <i>Note: The specific topic will be recorded when offered.</i>
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Other contact hours:																	
<b>Total</b>	<b>75</b>																
	<b>Maximum enrolment (for information only): 25</b> <b>Expected frequency of course offerings (every semester, annually, every other year, etc.): every other year</b>																
<b>Department / Program Head or Director:</b> Steven Marsh	<b>Date approved:</b> September 10, 2015																
<b>Faculty Council approval</b>	<b>Date approved:</b> October 2015																
<b>Campus-Wide Consultation (CWC)</b>	<b>Date of posting:</b> November 20, 2015																
<b>Dean/Associate VP:</b> Lucy Lee	<b>Date approved:</b> October 2015																
<b>Undergraduate Education Committee (UEC) approval</b>	<b>Date of meeting:</b> November 27, 2015																

**Learning Outcomes**

Upon successful completion of this course, students will be able to:

1. collect and describe organic sediments in the field for laboratory analysis;
2. process sediment samples in the laboratory to isolate fossils for identification;
3. identify common pollen and plant macrofossils;
4. interpret quantitative diagrams and statistics created using paleoecological data;
5. use wetland and lake sediments to interpret past environmental change; and
6. articulate how paleoecology informs society about past indigenous landscape management and traditional ecological knowledge.

**Prior Learning Assessment and Recognition (PLAR)**

Yes     No, PLAR cannot be awarded for this course because

**Typical Instructional Methods (guest lecturers, presentations, online instruction, field trips, etc.; may vary at department's discretion)**

Course format will include lectures, presentations, discussions, laboratory sessions, field trips, and the use of Blackboard Learn.

**Grading system:** Letter Grades:  Credit/No Credit:     Labs to be scheduled independent of lecture hours: Yes  No

**NOTE: The following sections may vary by instructor. Please see course syllabus available from the instructor.**

**Typical Text(s) and Resource Materials (if more space is required, download Supplemental Texts and Resource Materials form)**

Author (surname, initials)	Title (article, book, journal, etc.)	Current ed.	Publisher	Year
1. Brown, C.A.	Palynological Techniques, 2nd edition. American Association of Stratigraphic Palynologists Foundation, Dallas, TX, 137pp	<input checked="" type="checkbox"/>		2008
2. Kapp, R.O., O.K. Davis, and J.E. King,	Pollen and spores (2nd edition). American Association of Stratigraphic Palynologists Foundation. vi + 279 pp. Illustrated by R.C. Hall.	<input checked="" type="checkbox"/>		2000
3.	Articles from peer-reviewed journals and government reports.	<input checked="" type="checkbox"/>		
4.		<input type="checkbox"/>		
5.		<input type="checkbox"/>		

**Required Additional Supplies and Materials (software, hardware, tools, specialized clothing, etc.)**

Waterproof field notebook, Possible field-trip fee.

**Typical Evaluation Methods and Weighting**

Final exam:	30%	Assignments:	%	Midterm exam:	20 %	Practicum:	%
Quizzes/tests:	%	Lab exam:	20%	Field experience:	%	Shop work:	%
Presentation:	10%	Research paper:	15%	Participation:	5%	Total:	100%

**Details (if necessary):**

**Typical Course Content and Topics**

Week	Time
1	Introduction to environmental archives and proxies
2	Types of environmental archives
3	Field and laboratory methods
4	Types of proxies: Pollen and spores
5	Types of proxies: Plant macrofossils
6	Types of proxies: Diatoms, dinoflagellate cysts, foraminifera, and testate amoebae
7	Quantifying paleoecological data: Calculations
8	Quantifying paleoecological data: Illustration
9	Case study: Use of paleoecology to understand the influence of past climate change of vegetation
10	Case study: Use of paleoecology to determine the magnitude of pre-historic earthquakes
11	Case study: Use of paleoecology to understand how environments may change in the future
12	Case study: Use of paleoecology to explain indigenous practices and perspectives.
13	Student presentations

Each course offering will include a minimum of eight laboratory and field activities. Examples of such activities include a field assessment of wetland sediments as archives of past environmental change and opportunities to process field-collected samples and to identify fossils. Computer-assisted exercises will provide practice with quantitative methods. Blackboard Learn will be used as a means to organize course material, discuss course topics, complete fossil-identification exercises, and write exams.