UNIVERSITY OF THE FRASER VALLEY

OFFICIAL UNDERGRADUATE COURSE OUTLINE (page 1)

COURSE IMPLEMENTATION DATE: September 2012
COURSE REVISED IMPLEMENTATION DATE:
COURSE TO BE REVIEWED: February 2018
(six years after UPAC approval) *(month, year)*

OFFICIAL UNDERGRADUATE COURSE OUTLINE INFORMATION

Students are advised to keep course outlines in personal files for future use.
Shaded headings are subject to change at the discretion of the department – see course syllabus available from instructor

GEOG 419	Geography	4
COURSE NAME/NUMBER	FACULTY/DEPARTMENT	UFV CREDITS

Paleoecology
COURSE DESCRIPTIVE TITLE

CALENDAR DESCRIPTION:

Paleoecology is the study of past environments through the use of proxies such as pollen and other organic walled microfossils, plant macrofossils, diatoms, foraminifera, testate amoebae, and dinoflagellate cysts. During this course you will learn how these proxies can be used to reconstruct past environmental change driven by climate, sea-level change, earthquakes, floods, and fire. For the laboratory portion of the course we will make field trips to nearby locations to sample wetland sediments that we will later analyze with microscopes. Microfossils and macrofossils will be isolated and identified using standard taxonomic keys. Field trips outside of class time may be required. This course satisfies an Association of Professional Engineers and Geoscientists of B.C. requirement.

Note: This course is offered as GEOG 419 and BIO 419. Students may only take one of these for credit.

PREREQUISITES: GEOG 315 or GEOG 317; or BIO 210 and one of BIO 307, BIO 330, or BIO 340
COREQUISITES:
PRE or COREQUISITES:

SYNONYMOUS COURSE(S):
(a) Replaces:
(b) Cross-listed with: **BIO 419**
(c) Cannot take: **BIO 419, GEOG 400H** for further credit.

SERVICE COURSE TO: *(department/program)*

TOTAL HOURS PER TERM: **75**
STRUCTURE OF HOURS:

Lectures:	**39**	Hrs
Seminar:		Hrs
Laboratory:	**24**	Hrs
Field experience:	**12**	Hrs
Student directed learning:		Hrs
Other (specify):		Hrs

TRAINING DAY-BASED INSTRUCTION:
Length of course:
Hours per day:

OTHER:
Maximum enrolment: **25**
Expected frequency of course offerings:
(every semester, annually, every other year, etc.)

WILL TRANSFER CREDIT BE REQUESTED? (lower-level courses only)	☐ Yes	☐ No
WILL TRANSFER CREDIT BE REQUESTED? (upper-level requested by department)	☒ Yes	☐ No
TRANSFER CREDIT EXISTS IN BCCAT TRANSFER GUIDE:	☐ Yes	☒ No

Course designer(s): **Jonathan Hughes**

Department Head:	**Michelle Rhodes**	Date approved:	**November 4, 2011**
Supporting area consultation (Pre-UEC)		Date of meeting:	**January 13, 2012**
Curriculum Committee chair:	**Norm Taylor**	Date approved:	**December 16, 2011**
Dean/Associate VP:	**Ora Steyn**	Date approved:	**January 13, 2012**
Undergraduate Education Committee (UEC) approval		Date of meeting:	**February 3, 2012**

LEARNING OUTCOMES:

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

- Demonstrate a comprehend ion of geologic time relative to Quaternary biogeography and paleoecology;
- collect and describe organic sediments in the field for laboratory analysis;
- process sediment samples in the laboratory to isolate microfossils and macrofossils for identification;
- interpret quantitative diagrams and statistics typically used with paleoecological data;
- interpret wetland sediments as archives and proxies for past environmental change; and
- communicate their critical thinking within paleoecology.

METHODS: *(Guest lecturers, presentations, online instruction, field trips, etc.)*

Course format will include lectures, presentations, discussions, laboratory sessions, and field trips.

METHODS OF OBTAINING PRIOR LEARNING ASSESSMENT RECOGNITION (PLAR):

☒ Examination(s) ☒ Portfolio assessment ☐ Interview(s)

☐ Other (specify):

☐ PLAR cannot be awarded for this course for the following reason(s):

TEXTBOOKS, REFERENCES, MATERIALS: *[Textbook selection varies by instructor. Examples for this course might be:]*

Brown, C.A. 2008. Palynological Techniques, 2nd edition. American Association of Stratigraphic Palynologists Foundation, Dallas, TX, 137 pp.

Kapp, R.O., O.K. Davis, and J.E. King, 2000. Pollen and spores (2nd edition). American Association of Stratigraphic Palynologists Foundation. vi + 279 pp. Illustrated by R.C. Hall.

McAndrews, J.H., A.A. Berti, G. Norris. 1973. Key to the Quaternary pollen and spores of the Great Lakes region. Royal Ontario Museum, 61 pp.

Articles from peer-reviewed journals and government reports.

SUPPLIES / MATERIALS:

Waterproof field notebook
Possible field-trip fee

STUDENT EVALUATION: *[An example of student evaluation for this course might be:]*

Presentation	10%
Research paper	25%
Lab exam	30%
Final exam	30%
Participation	5%

COURSE CONTENT: *[Course content varies by instructor. An example of course content might be:]*

Week	***Topic***
1	Introduction Geologic Time Archives and proxies Types of questions paleoecology can answer
2	Field and laboratory methods *Lab: peruse field equipment and work with sediments in the lab*
3	Types of proxies – general overview *Lab: pollen and spore identification*
4	Palynology methods Quantification Pollen diagrams Ordination and classification *Lab: pollen and spore identification*

Course content continued:

4	Data analysis (case studies) *Lab: pollen and spore identification*
5	Plant macrofossil morphology *Lab: plant macrofossil identification* **Research paper due**
6	Plant macrofossil (case studies) *Lab: plant macrofossil identification*
7	Other proxies (dinoflagellate cysts, testate amoebae, foraminifera, and diatoms) *Lab: other proxies*
8	Other proxies *Lab: other proxies*
9	Other proxies (case studies) *Lab: review for lab exam*
10	**Lab exam**
11	Ecological forecasting
12	Archaeological and forensic paleoecology
13	**Student presentations**

When offered as a hybrid online course with field and laboratory components:

Using problem-based learning, field and laboratory components are combined with online instruction (hybrid model). An example problem-based exercise is to have students forecast the distribution of species in response to future climate change or develop conservation strategies in response to development or natural disturbance.

The course content listed above will be learned by students as they use inquiry-based methods to answer a suite of questions relevant to a specific problem.

Laboratory and field exercises will be completed on a weekly basis during regular class times over the course of the semester; in a condensed field-school format over one week; or in clusters of meetings over the course of the semester. Delivery format depends on when the course is offered