

IBIO*3100 (W 0.50) – *Interpreting Biodiversity I* Course Outline

Department of Integrative Biology, College of Biological Science

Professors:

Dr Steven Newmaster (CBG 208)

Dr Robert Hanner (CBG 217)

Biodiversity Institute of Ontario (BIO), Centre for Biodiversity Genomics (CBG),
University of Guelph

Phone: (519) 824-4120 (x56002 Newmaster; x53479 Hanner)

e-mail: snewmast@uoguelph.ca rhanner@uoguelph.ca

Course description:

Interpreting Biodiversity I is the first of two courses that explore global and local issues in biodiversity as a capstone experience for biodiversity majors. The overall goal of the course is to provide opportunities for BIOD students to apply their knowledge and skills to complex problems and issues involving biodiversity in academic, government, or industry spheres. The pedagogical approach utilizes “student centred service learning” where students will engage in a key uncertainty in biodiversity with an external “client,” who has a need to resolve such issues. The client may be a private company, a government agency or municipality, a lab or institute on campus, or an NGO. Students will work independently and as a group with the guidance of a course instructor and a TA. Assignments will include an annotated bibliography, a work plan, and development of a proposal. Faculty with relevant expertise for various parts of the project may participate as guest lecturers or faculty advisors. As a capstone experience for BIOD majors, the course will embrace a broad view of biodiversity that encompasses not only taxonomic diversity and abundance, but also ecological, evolutionary, and physiological aspects. This course also provides opportunities for undergraduates and benefit from direct project involvement with the University of Guelph’s world class Biodiversity Institute of Ontario (BIO) and the Centre for Biodiversity Genomics (CBG).

Prerequisite(s): 12.00 credits

Restriction(s): Enrolment restricted to BSCH:BIOD majors.

Learning Outcomes:

At the end of this course, students should be able to:

1. Describe, comprehend and evaluate issues in biodiversity within the context of the major concepts in biodiversity at various spatial (global/local) and temporal scales (historical/future predictions).
2. Develop key skills for exploring and interpreting biodiversity.
3. Identify variation in species and perform biodiversity sampling methods and analysis utilizing data from real collections or surveys at the Arboretum and the Biodiversity Institute of Ontario.
4. Apply critical thinking, analysis, and independent inquiry skills to complex and interdisciplinary issues through the evaluation of biodiversity scenarios.
5. Preparing a team research project proposal that will address a current biodiversity issue for an external client.

Lectures: Mondays 1:00-2:20

Labs: Mondays 2:30-5:20



Class Location: Biodiversity Institute of Ontario & Centre for Biodiversity Genomics

Format:

In-class Interactive Lectures (one 80 min. sessions/wk)

This course will not include lectures in the traditional sense. Instead, in-class interactions with the instructor and guest speakers will mainly function to guide students through the analysis of issues and concepts in biodiversity. These will be made as interactive as possible, using specimens and data as “learning objects” from current research projects. Issues and concepts in biodiversity will be selected that involve complex biological problems, which allow for the exploration of key concepts in evolution, ecology, and organismal biology.

Labs (3 hour session per week)

These Labs will address learning outcomes in both “Analyzing” and “Evaluating” biodiversity. Labs will include field and lab work that will represent a forum for student-directed discovery involving small group interaction with TAs and faculty. These will involve discussions of ideas and issues arising through group projects and critical evaluation of peer-reviewed research. They will also provide an engaging environment in which to carry out a group-based project (which will also involve interaction outside of the lab). Skills that will be developed on-line will be reinforced during the labs.

On-Line independent learning (weekly on-line assignments)

In addition to the lecture and lab components, students will engage in activities aimed at promoting self-assessment, skills development, background concepts and independent learning. These include the use of on-line tool such as D2L, Wiki, and concept mapping. Throughout the course, students will be encouraged to developing concept maps related to their project and the major learning outcomes* in the course. Concept mapping is a “learning object” that provides a mechanism of engagement in learner-centredness for complex learning outcomes making this an ideal tool of a senior course with many complex concepts. The University of Guelph Teaching Support Services (TTS) has adopted on-line software that will be available for the students. This is the same software used in first year biology BIOL 1070 and therefore reinforces this skill. The in-class interactions will focus on biodiversity issues that explore both skills and major concepts. The labs will emphasize skills development and small group interactions.

Central Concepts:

I. UNDERSTANDING BIODIVERSITY: Describe, comprehend and evaluate issues in biodiversity within the context of the major concepts in biodiversity at various spatial and temporal scales.

II. ANALYZING BIODIVERSITY: Identify variation in species and perform biodiversity sampling methods and analysis utilizing data from real collections or surveys.

Skills:

The course has the following as primary goals with respect to the development of specific skills:

1. To develop a productive philosophy for learning.
2. To develop capabilities for independent study and research, including the use of library, primary literature, and online resources.
3. To develop the ability to critically assess and analyze issues in biodiversity.
4. To develop skills for interpreting biodiversity including expertise in specific taxonomic groups of interest and methods for measuring and analysing diversity.
5. To develop expertise for working in groups cooperatively and efficiently.
6. To develop effective communication skills (written and oral).
7. To develop a level of comfort with the complexity and uncertainty inherent in biological science.
8. To develop the ability to design a project that provides solutions for an external client who is dealing with a specific biodiversity issue.

Assessment:

Evaluation	Learning Outcome #	Grade Weight
Skills Evaluation (Weekly assessment - Cumulative)	1,2,3	35%
Authentic Assessment* (Weekly assessment - Cumulative)	1,2,3	35%
Biodiversity Research Project Proposal (Due April 4)	4,5	20%
Project Work Plan (Due March 21)	4,5	10%

*Evaluation is weekly in each class.

Important Dates

- **Monday, February 20** – Winter Break begins; NO CLASSES THIS WEEK;
- **Friday, March 10** – Fortieth class day; Last day to drop one semester courses;
- **Monday, April 3** – Last class.

Skills Evaluation and Authentic Assessment

Skills and authentic assessment will be used to evaluate the student's capabilities to interpret concepts and issues in biodiversity. This requires students to develop responses rather than select from predetermined options and elicits higher order thinking in addition to basic skills. This synthetic approach uses samples of student work collected over the semester based on clear criteria made known to students at the beginning of the semester; this will include a series of questions and problems related to the suite of concepts and topics presented in lecture, workshops and on-line. The student portfolio will be a synthesis of biodiversity concepts, which will require novel applications of major concepts developed throughout the semester. These questions will be complex and will involve integration of several disciplines. Students will reflect on and demonstrate their conceptual development and understanding of biodiversity concepts using several skills including writing and the using concept mapping to demonstrate their ability to parse complex issues into interrelated components.

Biodiversity Research Project Proposal & Project Work Plan

This research project proposal will involve both independent and group components and will include several parts that can be evaluated independently. Students (in groups) will design a project and develop a research proposal and project work plan. Projects are real and will address client's need for biodiversity data, interpretation of patterns in the data and assess to critical biodiversity knowledge. The client will introduce the students to the project at the beginning of the semester. Assessment of both the research project proposal and the work plan will be divided into the following categories:

- Participation in a group, which will involve input from colleagues in the project group.
- “Authentic assessment” that will focus on how students perform tasks rather than testing specific information.
- Peer assessment, including peer review of work presented within and among groups by the students. This may utilize peer evaluation of the independent components of the term project prior to inclusion in the final group report.
- Performance assessment, covering the various components of the project reports (Proposal; Work Plan) assessed by the instructor.

University Policies:

E-mail Communication

As per university regulations, all students are required to check their <uoguelph.ca> e-mail account regularly: e-mail is the official route of communication between the University and its students.

Academic Consideration

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons, please advise the course instructor in writing, with your name, id#, and e-mail contact.

See the academic calendar for information on regulations and procedures for Academic Consideration: <http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml>

Academic Misconduct

The University of Guelph is committed to upholding the highest standards of academic integrity and it is the responsibility of all members of the University community, faculty, staff, and students to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring.

University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff and students have the responsibility of supporting an environment that discourages misconduct. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection. Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

The Academic Misconduct Policy is detailed in the Undergraduate Calendar:

<http://www.uoguelph.ca/registrar/calendars/undergraduate/current/>

Copies of out-of-class assignments

Keep paper and/or other reliable back-up copies of all out-of-class assignments: you may be asked to resubmit work at any time.

Accessibility

The University of Guelph is committed to creating a barrier-free environment. Providing services for students is a shared responsibility among students, faculty and administrators. This relationship is based on respect of individual rights, the dignity of the individual and the University community's shared commitment to an open and supportive learning environment. Students requiring service or accommodation, whether due to an identified, ongoing disability or a short-term disability should contact the Centre for Students with Disabilities as soon as possible.

For more information, contact CSD at 519-824-4120 ext. 56208 or email csd@uoguelph.ca or see the website: <http://www.uoguelph.ca/csd/>

Course Evaluation Information

CCS now provides the U of G Online Course Evaluation System in a secure, online environment. End of semester course and instructor evaluations provide students the opportunity to have their comments and opinions form part of the information used by Promotion and Tenure Committees in evaluating the faculty member's contributions in the area of teaching.

Course evaluations are now conducted through this web site. Login with your central email account login ID and password. https://courseeval.uoguelph.ca/CEVAL_LOGIN.php

Occasionally course evaluations are conducted in class.

Please Note:

Instructors do NOT receive evaluations until the end of exam period. Furthermore, evaluations are anonymous, unless you specifically indicate you want to acknowledge your comments

Drop date

The last date to drop one-semester courses, without academic penalty, is Friday March 6, 2015. For regulations and procedures for Dropping Courses, see the Academic Calendar:

<http://www.uoguelph.ca/registrar/calendars/undergraduate/current/>

Recording of Materials

Presentations which are made in relation to course work—including lectures—cannot be recorded or copied without the permission of the presenter, whether the instructor, a classmate or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

Resources

The Academic Calendars are the source of information about the University of Guelph's procedures, policies and regulations which apply to undergraduate, graduate and diploma programs:

<http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/index.shtml>