University of Guelph
Department of Integrative Biology

Limnology of Natural and Polluted Waters (BIOL*4350) – Fall 2014

COURSE OUTLINE

Contact Information and Class Schedule:

PROFESSOR: Dr. J.D. Ackerman; SCIE 2468; ×58268; ackerman@uoguelph.ca
LAB INSTRUCTOR: marie Thérèse Rush; SCIE 2502 or 2305 (lab) ×58379; mrush@uoguelph.ca
GTA: Keegan Lutek; SCIE 1470; klutek@uoguelph.ca
OFFICE HOURS: Thursday & Friday 1:30-3:00 pm, or by appointment via email.
LECTURES Tuesday/Thursday, 11:30am-12:50pm location MACK, Rm224
LABS Monday, 2:30pm - 5:20pm, SCIE 2305
Tuesday, 2:30pm - 5:20pm, SCIE 2305
HOMEPAGE CourseLink – BIOL*4350 F14 (01) Limnology of Nat & Pltd Waters

Course Description:

This course will familiarize students with the characteristics and methods of study of the limnology of natural and polluted aquatic ecosystems. The laboratory includes methods of biological, chemical and physical assessment such as field surveys of algal, macrophyte and benthic invertebrate diversity, toxicity assays, and analyses of stream flow. [0.5 credit]

Prerequisite(s): BIOL*3450 Introduction to Aquatic Environments

Responsibilities: 1) Student: - Open mind / willing to discuss and exchange views and to participate
- No electronic connections / recording
- Academic integrity/offence (see U of G Calendar)
2) Professor: - Responsive to students
- Fair and equitable

Problems: See me or have me recommend someone for you to see.

Course text: Moss, B.R. 2010. *Ecology of Fresh Waters 4th Ed.* Wiley-Blackwell. 480 pp.

Lab Manuals: Ackerman, J.D., F.W.H. Beamish, G.L. Mackie and m.T. Rush. 2014. *Limnology of Natural and Polluted Waters* 2014. Dept. Integrative Biology, Univ. Guelph.

Rush, m.T. (Editor). G.L. Mackie 2014– *Identification keys for life along the Speed River Watershed.* Dept. Integrative Biology, Univ. Guelph.

Evaluation:

Assessments	Weight	Date for completion	Learning Outcomes Addressed
Lake Study Assignment*	**2.5%**	Sept. 22nd (noon - Dropbox)	c, d, e, f
BOD Report*	**5%**	Oct. 6th (noon - Dropbox)	g, h, I, j, k, l, m
Midterm Exam	**25%**	Oct. 16th (in class)	1, 2, 5
Toxicity Report*	**10%**	Nov. 3rd (noon – Dropbox)	n, o, p, q, r
Stream Assessment Report*	**25%**	Nov. 17th (noon – Dropbox)	s, t, u, v, w, x, y, z, aa, bb
Peer Evaluation*	**2.5%**	TBA (ongoing in lab/field)	a, b
Final Exam	**30%**	Dec. 9th 8:30-10:30	1, 2, 3, 4, 5, 6
*Denotes Laboratory component	**100%**		

LATE ASSIGNMENTS: Not accepted without prior arrangement (10% penalty/day).

Course Structure:

The course is divided into twelve weeks, with two lectures and one lab period per week. Lecture topics are listed in the Lecture Schedule below:

LECTURE SCHEDULE

DATES	TOPICS*
Sept. 4	L1 – An Introduction to Natural and Polluted Waters (Ch 1)
Sept. 9	L2 – Hydrology and Light (Ch 2 and 5)
Sept. 11	L3 – Physical-Chemical Properties of Water (Ch 3 and 4)
Sept. 16	L4 – Sinks and Sources of Oxygen (Ch 3)
Sept. 18	L5 – Environmental Impact Assessment
Sept. 23	L6 – Evolution and Diversity of Freshwater Organisms (Ch 6)
Sept. 25	L7 – Headwater Streams (Ch 7)
Sept. 30	L8 – Headwater Streams – Environmental Impacts (Ch 8)
Oct. 2	L9 – Statistical Analysis I – Univariate Statistics (Ch 9)
Oct. 7	L10 – Statistical Analysis II – Spatial and Temporal Analysis (Ch 10)
Oct. 9	L11 – Hypothesis Formulation and Testing (Ch 11)
Oct. 14	Study Break *(no lecture)*
Oct. 16	**Midterm Exam**
Oct. 21	L12 – Floodplain Streams (Ch 9)
Oct. 23	L13 – Floodplain Streams – Environmental Impacts (Ch 10)
Oct. 28	L14 – Lakes and Wetlands (Ch 11 and 12)
Oct. 30	L15 – Lakes – Pelagic Zones (Ch 13)
Nov. 4	L16 – Lakes – Profundal Zones (Ch 14)
Nov. 6	L17 – Lakes – Environmental Impacts of Fisheries (Ch 15)
Nov. 11	L18 – Lakes – Environmental Impacts of Nutrients Additions (Ch 15)
Nov. 13	L19 – Lakes – Introduced species in the Great Lakes
Nov. 18	L20 – Intermittent Stratification in the Western Lake Erie
Nov. 20	L21 – Acidification in Aquatic Systems
Nov. 25	L22 – Nutrient Management in Aquatic Systems
Nov. 27	*Replaces Study Break (Tue. Oct. 14th)*

*Subject to change
Links to additional required readings will be posted on CourseLink.

LABORATORY SCHEDULE

DATES	TOPICS
Sept. 8 - 9	**Lab 1: Team Building** Introduction and examination of field equipment; review of lab and field exercises; divide into groups, team building contract. *Attendance Mandatory*
Sept. 15 - 16	**Lab 2: Lake Study – *Field trip I*** Lentic environment study – demonstration of sampling equipment, sampling. *Dress accordingly for the weather; pencil or pen; and a note book.*
Sept. 22nd	**Lake Study Assignment** due at noon: Monday, Sept. 22nd (Dropbox)
Sept. 22 - 23	**Lab 3: Biological Oxygen Demand – 96h Study** *Experiments run Monday to Friday*
Sept. 29 – 30	**Lab 4: Bioassessment - *Field trip II*** Lotic environment study. *Dress accordingly for the weather; bring waders (if you have them), forceps for picking invertebrates out of samples, lab manual, pencil (not pen) and a note book.*
Oct. 6th	**B.O.D. Report** due at noon: Monday, Oct. 6th (Dropbox)
Oct. 6 - 7	**Lab 5: Bioassessment - *Field trip III*** Lotic environment study. *Dress accordingly for the weather; bring waders (if you have them), forceps for picking invertebrates out of samples, lab manual, pencil (not pen) and a note book.*
Oct. 13 - 14	*Thanksgiving Holiday & Study Break – no labs this week*
Oct. 20th	**Chemical / Physical Data Analysis*** due at noon: Monday, Oct. 20th (Dropbox)
Oct. 20 - 21	**Lab 6: Acute Lethal Toxicity** Conduct experiments on Daphnia. *Experiments run Monday to Friday*
Oct. 27 – 28	**Lab 7: Macroinvertebrate ID** *upstream site*
Nov. 3rd	**Toxicity Report** due at noon: Monday, Nov. 3rd (Dropbox)
Nov. 3 - 4	**Lab 8: Macroinvertebrate ID** *downstream site.*
Nov. 10th	**Biological Metrics Analyses*** due at noon: Monday, Nov. 10th (Dropbox)
Nov. 10 - 11	**Lab 9: Complete Lab Analyses**
Nov. 17th	**Stream Assessment Report** due at noon: Monday, Nov. 17th (Dropbox)
Nov. 17 - 18	**Lab 10: Tour of Guelph Water Pollution Control Plant** Read Chapter Six: "Sewage Treatment" prior to the field excursion.

NOTE: For all reports, follow instructions in the laboratory manual. The reports will be graded very strictly for format according to that used by the *Canadian Journal of Fisheries and Aquatic Sciences* (CJFAS). See the lab manual and CourseLink – for details

It is incumbent on the student to inform the instructors of the course within the first two weeks of class if there is a conflict between a student's religious observations (Holy Days) and a scheduled lab component, or lecture / lab evaluations.

Learning Outcomes

Below is a graphical representation of student learning outcomes for the lecture component of BIOL*4350. Content topics are listed in light blue boxes. The two main learning outcomes are represented by mauve boxes while the modes for demonstrating competency in the outcomes are placed below them and are represented by light green boxes.

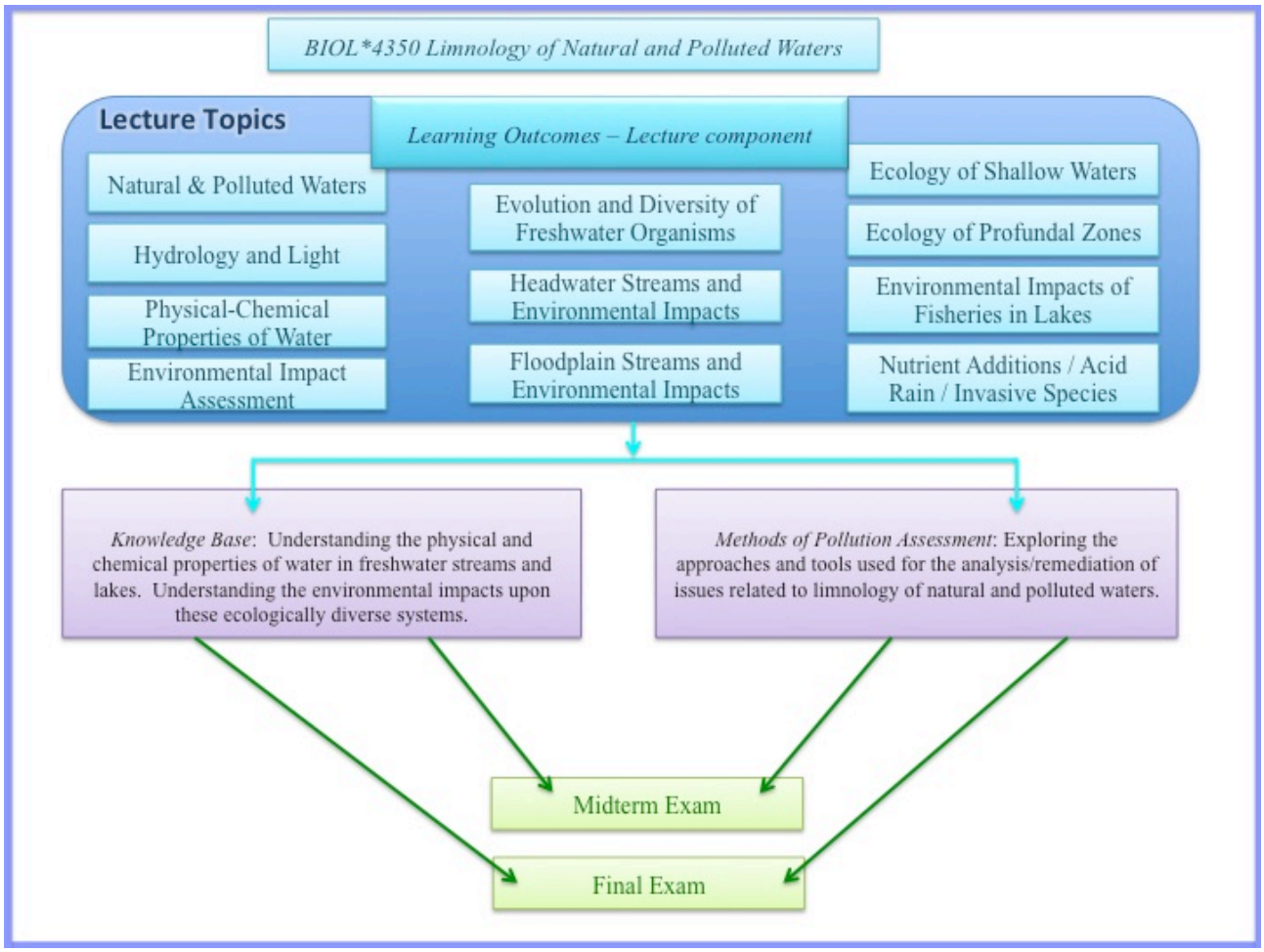

Figure 1: Learning Outcomes – Lecture component of BIOL*4350

Lecture Learning Outcomes

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

1. Understand discuss the physical and chemical properties of water in freshwater streams and lakes.
2. Recognize and discuss the environmental impacts upon ecologically diverse systems: headwater streams; floodplain streams; shallow waters including wetlands; profundal zones; lakes; and dispersion in rivers.
3. Describe and discuss the environmental impact of nutrient additions; acid rain; hypoxia and invasive species.
4. Explain the environmental impacts of fisheries in lakes.
5. Apply approaches and tools to analyze/mediate issues related to water pollution in freshwater.
6. Synthesize, and using case studies, develop an understanding of anticipated environmental impact statements, mitigation and restoration methods.

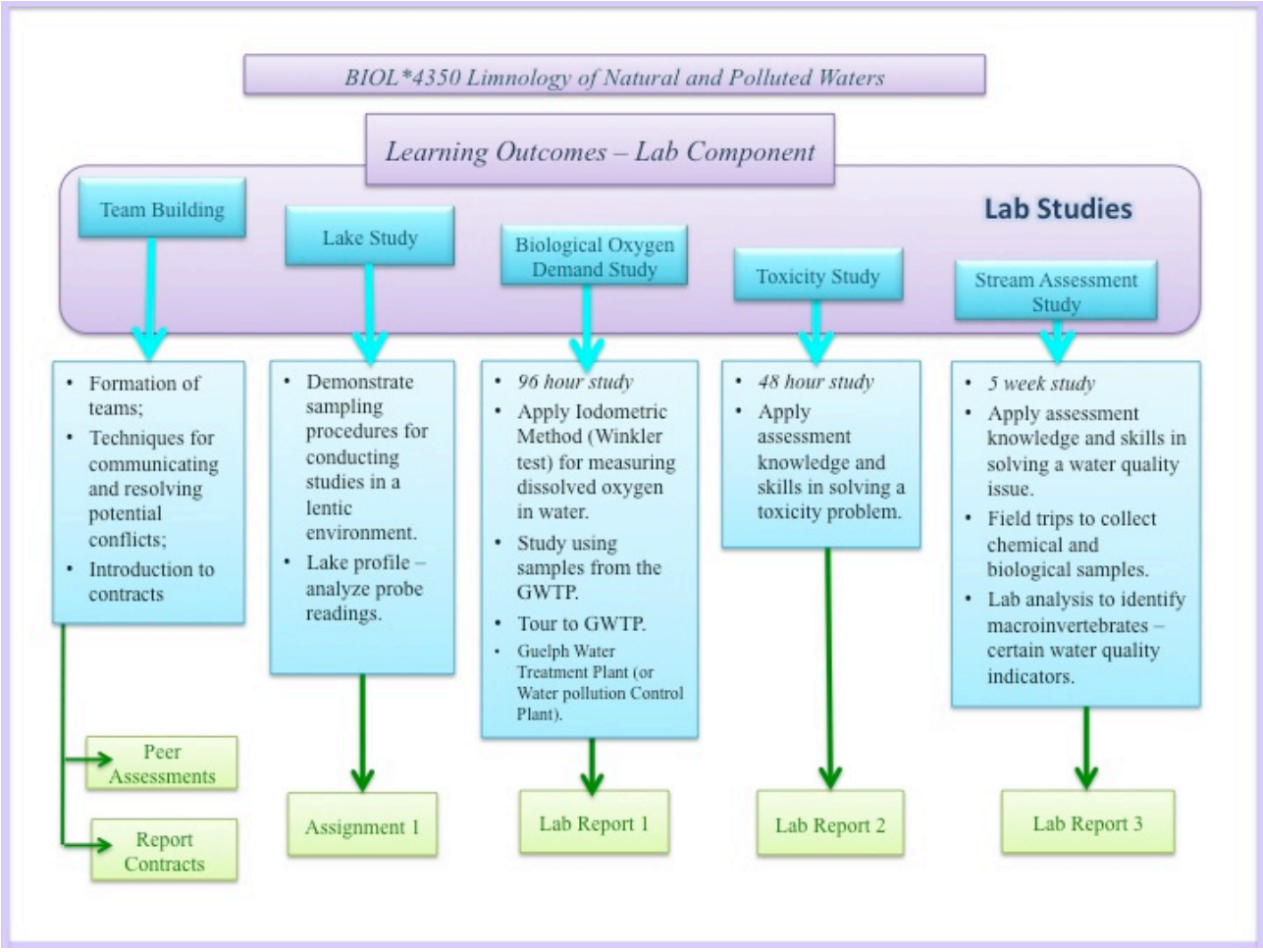

Figure 2: Learning Outcomes - Lab component of BIOL*4350

Above is a graphical representation of student learning outcomes for the lab component of BIOL*4350. Lab Studies are listed in bright blue boxes. The five main groups of learning outcomes are represented by light blue boxes while the modes for demonstrating competency are placed below them and are represented by light green boxes.

Lab component Learning outcomes:

Team Building

a. Cooperation and Collaboration skills applied to group work and assessed by means of team contracts and evaluations following the BOD, bioassay, lake and stream assessments.
b. Techniques for communicating and resolving potential conflicts generated via scenarios and class discussions.

Lake Study

c. Examine lentic sampling procedures and equipment in the field.
d. Operate and collect probe readings for further investigation.
e. Analyze probe readings and generate report of lake profile findings.
f. Compare lake profiles (i.e. during different seasonal conditions).

Biological Oxygen Demand [B.O.D.] Study

g. Organize and conduct a 96 hour experiment to study Biological Oxygen Demand.
h. Follow proper procedure for disposing of hazardous waste.

i. Apply the iodometric method (Winkler test) for measuring dissolved oxygen in water on samples from the Guelph Wastewater Treatment Plant [GWTP].
j. Compare GWTP samples taken at the beginning of the treatment phase and near the end of the treatment phase.
k. Create a high quality BOD scientific study by collecting, analyzing and synthesizing the study results.
l. Create a high quality scientific paper following the format for publication given in the Canadian Journal of Fisheries and Aquatic Sciences and including criteria as set out in the rubric for this report.
m. Inspect and tour the GWTP; reinforcing concepts learned in the Biological Oxygen Demand [B.O.D.] Study.

Toxicity Study

n. Organize and conduct a 48 hour experiment to study Toxicity.
o. Follow EPA's protocols using Daphnia as the indicator species in a bioassay.
p. Follow Standard Operating Procedures for chemical use during the study.
q. Analyze mortality data and generate LC50, confidence limits and slope given for the toxicant.
r. Create a high quality Bioassay scientific paper following the format for publication given in the Canadian Journal of Fisheries and Aquatic Sciences and including criteria as set out in the rubric for this report.

Stream Bioassessment Study

s. Enhancing skills in collecting; identifying and enumerating benthic stream macroinvertebrates using equipment and identification guides.
t. Develop skills in use of stream collecting equipment and benthic stream macroinvertebrates sampling applied to generate 100 specimen samples.
u. Calculate and generate water quality metrices to assess the biological data.
v. Evaluate water quality of stream sites based on EPA's Rapid Bioassessment Protocols.
w. Report bioassessment findings to research colleagues in timely manner.
x. Conduct chemical and physical water quality measures using specialized (HACH) S.O.P. and equipment.
y. Report chemical and physical water quality measures in timely manner to research colleagues.
z. Engage in respectful procedures for disposing sample solutions, reagents and materials in the field and in the lab.
aa. Analyze chemical-physical and biological metrices data using ANOVA and Tukey's.
bb. Generate a high quality Bioassessment scientific paper following the format for publication given in the Canadian Journal of Fisheries and Aquatic Sciences and including criteria as set out in the rubric for this report.

Resources – Course Materials:

Iclicker:
Please bring Iclicker for use in lectures, to provide anonymous feedback.

Required Textbook:
Moss, B.R. 2010. *Ecology of Fresh Waters 4th Ed.* Wiley- Blackwell. 480 pp.

Required Lab Manuals:

Ackerman, J.D., F.W.H. Beamish, G.L. Mackie & m.T. Rush. 2014. *Limnology of Natural and Polluted Waters* 2014. Department of Integrative Biology, College of Biological Science, University of Guelph, Guelph, Ontario, Canada.

Rush, m.T. (Editor). 2014. G.L. Mackie – *Identification keys for life along the Speed River Watershed.* Department of Integrative Biology, University of Guelph, Guelph, Ontario, Canada.

The lab manuals will be available for sale from the Department of Integrative Biology, the first week of classes. Check CourseLink for information on dates and times for purchasing lab manuals.

CourseLink:

This course will make use of the University of Guelph's course website on D2L(via CourseLink). Consequently, you are responsible for all information posted on the CourseLink page for **BIOL*4350**. Please check it regularly.

PDFs of Lecture Presentations will be posted on Courselink prior to each lecture. Please check for any revisions to the PDF files (indicated by "-R.pdf), which may be posted after the lecture.

Undergraduate Calendar:

is the source of information about the University of Guelph's procedures, policies an regulations, which apply to undergraduate programs. It can be found at: http://www.uoguelph.ca/registrar/calendars/undergraduate/current

Lab equipment:

Students will be responsible for providing their own lab coats, dissection instruments, rulers, pencils, and laboratory notebooks.

Lectures

Recommended readings will supplement the faculty lectures. Students will be given opportunity and encouraged during lectures and laboratories to discuss questions arising from lectures and related readings. Students who miss lectures for any reason are responsible for the material covered.

Laboratories

Laboratory instructions will be provided online, and during prelab talks. Attendance is mandatory as the studies in this field require the active participation of each team member to set-up, run experiments, obtain measurements and observations, analyze data, identify macroinvertebrates, write lab reports and collaborate with team members. If you are not willing to give 100% effort to these studies, then please think about taking another course. Otherwise you would be jeopardizing the success of the studies and you would be letting your class colleagues down.

Important Dates (also see University of Guelph Calendar):

Sept. 4 (Thurs): first lecture in BIOL*4350

Sept. 8 - 9 (Mon & Tues): first lab in BIOL*4530, 2:30 pm

Sept. 12 (Fri): Add period ends

Sept. 22 (Mon): Lake Study assignment due before noon

Oct. 6 (Mon): Due date for B.O.D. lab report – before noon; Course selection period for Winter Semester 2015 begins

Oct. 13 (Mon): Thanksgiving – holiday. The university has scheduled an extra class day at the end of the semester (Friday, Nov. 28th) to replace Thanksgiving Monday.

Oct. 14 (Tue): Fall Study Break. The university has scheduled an extra class day at the end of the semester (Thursday, Nov. 27th) to replace Study Break.

Oct. 16 (Thurs): Midterm Exam

Oct. 20 (Mon): Chemical / Physical Analyses due – before noon

Oct. 30 (Thurs): Fortieth Class Day – last day to drop course

Nov. 3 (Mon): Due date for Toxicity lab report – before noon

Nov. 10 (Mon): Biological Metrics Analyses due – before noon

Nov. 17 (Mon): Due date for Stream Assessment lab report – before noon

Dec. 1 (Mon): Examinations commence

Dec. 9 (Tues): Final exam (Location = TBA)

Methods of Assessment:

Grades will be assigned according to the standards outlined in the U of G Undergraduate Calendar. Refer to *Assignment of Grades* under *Course Policies* in the section following *Methods of Assessment*.

Course Grade

Your final grade in the course will be composed of:
Laboratory assessments:

Lake Study Assignment	02.5%
BOD Report	05.0%
Toxicity Report	10.0%
Stream Assessment Report	25.0%
Peer Evaluation	02.5%
Midterm Exam	**25.0%**
Final Exam	**30.0%**

Students will be held responsible for all materials given in lectures, laboratory classes, and as specific reading assignments unless otherwise stated. No unofficial deferments of any scheduled evaluation will be given. Students who miss the midterm or other assessment components for documented medical or other legitimate reasons will have their final marks pro-rated on the basis of completed evaluations. No make-up evaluations will be conducted and all other reports and the final exam must be completed in order to pass the course.

Laboratory Assessments (worth 45%)

Lake Study Assignment (worth 2.5%)

Students will prepare tables / figures of probe readings taken from the Lake Study. The assignment is due Mon. Sept. 22nd at noon to be submitted electronically in the DropBox.

B.O.D. Report (worth 5%)

A scientific report following standards of CJFAS on the results of the biochemical oxygen demand study is required from each TEAM (3 per group) of students. The report must not exceed five pages of text (typed, double-spaced). The report is due Mon. Oct. 6th at noon. The report should be

submitted electronically in the DropBox. The first report is not worth as much as the other two reports. It is hoped that students will learn the importance of writing a lab report with proper sections, captions, etc. and proper citing, referencing and formatting with this first report and so will be able to submit high quality reports in the future assignments.

Toxicity Report (worth 10%)

Acute Lethal Toxicity report following standards of CJFAS on the results of the toxicity study is required from each TEAM (3 per group) of students. The report itself must not exceed six pages of text (typed, double-spaced). The report is due Mon. Nov. 3rd at noon to be submitted electronically in the DropBox.

Stream Assessment Report (worth 25%)

A Rapid Bioassessment Protocol evaluation of a stream. Teams are to submit their Chemical / Physical Data Analyses Mon. Oct. 20th at noon in the Dropbox. The Biological Metrics Analyses are to be submitted Mon. Nov. 10th at noon in the Dropbox. A scientific report following standards of CJFAS on the results of the RBP bioassessment protocol evaluation is required from each TEAM (3 per group) of students. The report must not exceed ten pages of text (typed, double-spaced). The report is due Mon. Nov. 17th at noon in the DropBox.

Peer Assessments (worth 2.5%)

Peer evaluation of student performance and contribution to the Team Building, Lake Study, B.O.D., Toxicity and Stream Assessment studies: preparing for each session, working in the lab, cleaning equipment and bench top following the lab, working with team members on the studies, communicating effectively with team members, submitting completed observations, measures, analyses as required; submitting completed sections to team members on time for review prior to submission, and completing team contracts.

- Team members will also be required to submit ***Peer Assessments survey forms***: A *"Teams" participation assessment* and a *"Team Player" participation assessment* for each report.
- An attempt at quality control to encourage all members of a group to participate equally; a contract page listing the names of each team member, the amount of time devoted to the study and the report section(s) written, is to be submitted. A team contract must be completed for each of the four reports.

Re: Submission of lab report without contract: Lab Reports which lack completed contracts are not considered complete and the team will be given a mark of zero. Exception: Lab reports will be accepted with a 10% penalty, if the team can provide the contract within 24 hours of the report deadline.

Midterm Exam (worth 25%)

The midterm test will be a written test and will be held during a regular scheduled lecture time schedule. The test will include all the material presented in class up to the preceding lecture period. The results from the midterm will constitute 25% of your final mark and will consist primarily of short answer type questions. Synthesis of concepts, rather than straight regurgitation of facts will be emphasized.

Final Exam (worth 30%)

The final exam will be a written, two hour exam held during the exam period. The exam will consist of definitions and short-answers based on all of the content covered in the course. You will be assessed on your ability to evaluate the information and interpret it in light of the studies you have examined in the lecture.

Course Policies:

Student Responsibilities in the class:

- Open mind / willing to discuss and exchange views and to participate.
- No electronic connections / recording
- Academic integrity / offence (See U. of G. Calendar)
- If problems arise – see Prof. Ackerman or have him recommend someone for you to see.
- Late Assignments are not accepted without prior arrangement and with 10% penalty/day.
- When contacting Prof. Ackerman, arrange appointments via email.

Appropriate Use of Conferences

This course has been designed to foster interaction between students, student teams and with the instructors. The conferences provide a means for team members to share ideas, opinions, and resources. The use of these computer conferences is a privilege, not a right, which may be revoked at any time for abusive conduct.

Please show respect for the opinions of others at all times, even if you do not agree with their ideas. We encourage you to disagree, critique and add new insights, but this must be done in a positive manner. Discussions in the online conferences must be treated the same as face-to-face discussions. In the conferences others cannot see such things as facial expression and body language, both of which we normally take into account when talking face-to-face with someone. Therefore, be very careful in the phrasing of your contributions and responses, as they may be interpreted differently than what you had intended. Please respect your fellow students. You MUST NOT post racist, sexist, homophobic, or other similar remarks that are likely to cause offence. Please keep in mind that the conferences are public places. Anyone with access to the course website has the capability of seeing conference postings.

Assignment of Grades

Work in this course is evaluated according to the University of Guelph grading standards. For a definition of the numerical grades you receive please see Resolution 1 in the section on Grading Procedures under Grades in VIII: Undergraduate Degree Regulations and Procedures in the University of Guelph 2014-2015 Undergraduate Calendar.

- ***Link:*** See Resolution 1 under Grading Procedures in the Undergraduate Calendar for a description of grading standards used at the University of Guelph.
- Grading rubrics will be used to illustrate the specific grading criteria used to evaluate the lab reports. These are available on CourseLink.
- You may check your grades at any time during the semester through the Grades page on the course website.

Late Policy

Late assignments are not accepted without prior arrangement. Work that is handed in late will be penalized 10% for every day that it is late.

Absence and Illness. If you are absent from classes during the semester, you will be expected to make up missed lecture and laboratory material on your own.

Academic Consideration

If you miss deadlines for medical, psychological, or compassionate reasons, please contact the instructor as soon as possible to make alternate arrangements. For more details about academic consideration see the section on Academic Consideration, Appeals and Petitions in the University of Guelph 2014-2015 Undergraduate Calendar.

- ***Link:*** See the section on Academic Consideration, Appeals and Petitions for details regarding

academic consideration.

Academic Integrity

Although we do encourage you to share thoughts and ideas while studying for the course, all material submitted for grading MUST BE YOUR OWN work! The University takes a serious view of academic misconduct, including plagiarism. The penalties for academic misconduct are severe and can lead to expulsion from the University and the revocation/rescinding of a degree.

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:

- ***Link:*** http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml

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.

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.

Course Philosophy and Roles:

Pedagogical Values

This course aims to support the mission statement and the learning objectives set out by the University of Guelph in the Undergraduate Calendar. This means that this course will be research intensive and learner-centered. Ultimately we want students to be capable of self-assessment, critical inquiry, and active learning.

- ***Link:*** Read the University of Guelph Mission Statement in the Undergraduate Calendar.
- ***Link:*** Read the University of Guelph Learning Objectives in the Undergraduate Calendar.

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.csd.uoguelph.ca/csd/**

Teaching Philosophy

In support of the University Mission statement, we will adopt a learner-centered approach to teaching. In this course, that means that instructors are not the only ones responsible for depositing knowledge into the minds of students. Instead, you are expected to take an active role in your own learning. The teaching team will provide opportunities for you to learn independently and from one another, and will coach you in the skills needed to do so effectively. The lecture component provides the required content material for your understanding and enables you to build upon this knowledge.

Metaphorically speaking, the lab instructor and teaching assistant will not be "the sage on the stage" but rather "the guide on the side", because research shows this method can lead to an increased motivation to learn, greater retention of knowledge and a deeper understanding of the material.

Teaching Team's Role and Responsibility to Students

In this course you can expect your instructors to…

- Clearly define the course learning objectives
- Provide well articulated activities that enhance learning
- Ensure timely and fair grading procedures
- Notify you of events, deadlines, announcements concerning grades, and other official information
- Provide and adhere to well defined policies and procedures as described in the course outline, and the Undergraduate Calendar
- Provide assistance, when asked, if you are having difficulties in the course
- Reply to email correspondence in a timely fashion
- Foster and uphold an environment of academic integrity and a love of learning
- In particular, the Professor's role is to be responsive to students and to be fair and equitable.

Your Learning Responsibilities

Your success in this course depends on your response to the opportunities this course offers you. As a student in this course, you are responsible for…

- Knowing the course learning objectives as covered in the lecture and lab components each week.
- Prepare for, attend, and review your lecture and lab components.
- Contact your professor if you have any difficulties with the course.
- Completing all required lecture and lab objectives and assignments in a timely manner as they impact your team members.
- Reading the assigned resources on the course website and through e-reserve.
- Reading all announcements and other class material distributed in class or on-line.
- Accessing the CourseLink regularly for important communications from the course instructors or teaching assistants.
- Understanding and adhering to policies and procedures as described in the course outline, and the Undergraduate Calendar.
- Understanding grading procedures.
- Familiarizing yourself with the course schedule of dates with particular attention to deadlines.
- Initiating action, in advance of due dates, by consulting your instructor or program counsellor if extenuating circumstances affect your academic performance.
- Understanding what constitutes academic misconduct and refraining from it.

- In particular, the student's responsibility is to be open minded and willing to discuss and exchange views and to participate in the lectures and lab sessions. The student will not use electronic connections or recordings in the lecture hall as a sign of respect for the Professor.

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.

When You Cannot Meet a Course Requirement

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 undergraduate calendar for information on regulations and procedures for

Academic Consideration:
http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml

Drop Date

The last date to drop one-semester courses, without academic penalty, for Fall 2014 is Thursday, October 30, 2014. For regulations and procedures for Dropping Courses, see the Undergraduate Calendar: http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-drop.shtml

Technical Requirements

The course web site provides the connection between you and your fellow classmates. When collaborating on class data, it is essential that you are able to connect properly to our course in CourseLink. For adequate interaction with the course web site please make sure that your computer meets the minimum requirements.

- ***Link:*** See the recommended System Requirements for use with CourseLink.

If you do not have these technical requirements, consider either upgrading your personal computer, or using a machine on-campus. Trying to use someone else's computer for the course may prove to be frustrating and difficult.

Please follow this quick System Check to determine if you have the right setup. (Results will be displayed in a new browser window).

- ***Link:*** Do a System Check to make sure that your computer is configured properly for this course.

Course Evaluation:

Course Evaluation information (from the CCS website)
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

This outline is distributed for information and is available via CourseLink. Failure to obtain a copy of this outline in the first instance, or to read and respond accordingly to its contents, are not acceptable grounds for complaints after the first week of classes.

In particular, no changes in the marking, grading or evaluation scheme will be made without the agreement of the professor, lab instructor and the written consent of all students enrolled in the course. There will be no unofficial deferments of any scheduled evaluation. Students who miss any evaluation for documented medical or other legitimate reasons will have their final grades pro-rated on the basis of completed evaluations. No make-up evaluations will be conducted during the semester. Students who miss laboratories for any reason are responsible for the material covered.

Campus Resources

If you are concerned about any aspect of your academic program:

- make an appointment with a program counsellor in your degree program. http://www.bsc.uoguelph.ca/index.shtml or https://www.uoguelph.ca/uaic/programcounsellors

If you are struggling to succeed academically:

- There are numerous academic resources offered by the Learning Commons including, Supported Learning Groups for a variety of courses, workshops related to time management, taking multiple choice exams, and general study skills. You can also set up individualized appointments with a learning specialist. http://www.learningcommons.uoguelph.ca/

If you are struggling with personal or health issues:

- Counselling services offers individualized appointments to help students work through personal struggles that may be impacting their academic performance. https://www.uoguelph.ca/counselling/
- Student Health Services is located on campus and is available to provide medical attention. https://www.uoguelph.ca/studenthealthservices/clinic
- For support related to stress and anxiety, besides Health Services and Counselling Services, Kathy Somers runs training workshops and one-on-one sessions related to stress management and high performance situations. http://www.uoguelph.ca/~ksomers/

If you have a documented disability or think you may have a disability:

- The Centre for Students with Disabilities (CSD) can provide services and support for students with a documented learning or physical disability. They can also provide information about how to be tested for a learning disability. For more information, including how to register with the centre please see: https://www.uoguelph.ca/csd/

Posted dates and information are from the *University of Guelph 2014-2015 Undergraduate Calendar* (www.uoguelph.ca/registrar/calendars/undergraduate/current/), which is considered the final authority.