INSTRUCTORS:
Dr. Verónica G. Rodríguez Moncalvo (rodrigvg@mcmaster.ca)
Dr. Erin Leonard (leonarem@mcmaster.ca)
Aaron Thomas (thomasac@mcmaster.ca)

Course Description:
This class will develop the abilities of students to evaluate scientific methodologies, to defend research proposals, and to present scientific data and disseminate this knowledge to level II students. Projects will focus on developing experimental techniques and laboratory protocols. Students in this course will be mentors for students in Level II.

PREREQUISITES: LIFESCI 2L03.

Required Texts & Materials: There is no required textbook for this course. Assigned readings will be posted on Avenue to Learn (http://avenue.mcmaster.ca/). Students are responsible for downloading the readings and bringing them to class.

Learning Objectives:
By the end of the course, students should be able to:
1. Define and achieve personal learning goals in relation to mentoring in science:
   - Develop SMART goals, intended learning outcomes and a mentoring philosophy
   - Identify possible learning strategies, experiences, or processes that would lead to achievement of goals which align to mentoring philosophy
   - Provide evidence of achievement of mentoring goals and learning outcomes
2. Develop the ability to evaluate scientific methodologies, to defend research proposals, and to present scientific data and disseminate this knowledge to mentees
   - Develop knowledge of scientific methodologies and the appropriate methods for data collection and analysis
3. Develop a tutorial lesson plan
   - Construct a lesson plan following the BOPPPS method
   - Develop learning outcomes, teaching and learning activities that facilitate the attainment of such outcomes, and assessment of learning effectiveness.

Format and Class time:
This course includes both lecture hours (3h) and hands-on practical experience (3 h) in mentoring that is scheduled in tutorial (2h) and laboratory time (1h). Up to one hour of lecture time will be devoted to tutorial preparation. Attendance to lectures as well as tutorials and labs is mandatory for this course. Lectures: Mondays 8:30-9:30 am in ABB106 and 9:30-11:20 am in ABB 164.
**Labs and Tutorials:** LIFE SCI 3YY3 Peer mentors will interact with Level II students enrolled in LIFE SCI 2L03 in a tutorial-like environment in a 32 (mentee):2 or 1 (mentor) ratio. Please check the schedule for the time and location of your designated tutorial and lab.

**Evaluation:**

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Mentoring goals, plan and proposed evidence</td>
<td>10%</td>
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<tr>
<td>Tutorial lesson plan</td>
<td>7%</td>
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<tr>
<td>Integration of theory and practice</td>
<td>10%</td>
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<tr>
<td>Mentoring philosophy (draft)</td>
<td>5%</td>
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<td>Research defense</td>
<td>10%</td>
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<tr>
<td>Scientific research proposal</td>
<td>8%</td>
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<td>Portfolio</td>
<td>35%</td>
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<td>- Mentoring philosophy (10%)</td>
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<td>- Goals (0%)</td>
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<td>- Evidence – mid-term survey monkey (~3%) plus 10% in portfolio</td>
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<td>- Summative analysis (12%)</td>
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<tr>
<td>Participation</td>
<td>15%</td>
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**Notes on Assessment:**

**Mentoring Goals, Plan, and Proposed Evidence (10%)**

A clearly articulated statement of personal learning goals is significant for developing the skills needed to successfully support the learning of second-year students. Literature and peer discussion on mentorship and leadership will help shape your personal goals. After receiving feedback, you will develop a final statement and plan for how you will accomplish your goals. You will also include a plan for measuring your achievements.

**Due Dates:**

- **Submit preliminary draft** of your mentoring goals to Avenue Dropbox by 11:59 pm on January 14th. ALSO bring a hard copy to class on January 15 for peer feedback.
- **Submit your revised goals and achievement** to Avenue Dropbox by 11:59 pm on January 21st.

**Tutorial Lesson Plan (7%)**

“A good teaching system aligns teaching method and assessment to the learning activities stated in the objectives, so that all aspects of this system are in accord in supporting appropriate student learning. This system is called *constructive alignment*, based as it is on the twin principles of constructivism in learning and alignment in teaching” John Biggs (1999). Mentors are to develop a lesson plan for one of the tutorials using the BOPPPS method. Mentors need to develop learning outcomes, teaching and learning activities that facilitate the attainment of such outcomes and assessment both as a motivation for learning and as a measure of learning effectiveness.

**Due Dates:**

- **Submit draft lesson plan** to Avenue Dropbox by 11:59 pm on the Sunday one week prior to your presentation week.
• **10 min oral presentation** with 5 min questions/discussion will be given to mentors and TAs prior to the tutorial.

**Integration of theory and practice (10%)**

This on-going assignment will help you develop your skills in science communication as a reflective practitioner as you work on implementing mentor-related principles and theory into real-world practice. You will regularly keep notes on your experiences that reflect upon on what is being discussed in lecture, your readings and the application of this material to your experiences in mentoring students. The idea of these entries is to help you focus on relating the course material to practical experiences so you can begin to make connections between theory and practice.

**Due dates:**

- Informal Practice Notes: Multiple due dates throughout semester
- Survey monkey/evidence – February 11th at 11:59 pm with two forms of evidence, one quantitative and one qualitative
- Peer feedback for written and oral communications: Multiple due dates throughout semester

**Mentoring Philosophy (draft, 5%)**

In a statement called a Mentoring Philosophy, you will articulate your beliefs about what makes for good mentoring, what mentoring means to you and how you apply it in life. You will write this as a formal statement that is self-focused and written in the first person. As the course progresses, you will have many experiences from which to draw upon to create and shape your mentoring philosophy. You will consider the importance of mentorship in the field of science (as discussed throughout the term) as well as your own research interests in relation to your mentorship experiences for this assignment. A draft will be submitted to your instructors for feedback. The final version that you submit with your culminating assignment, the Mentoring Portfolio, should take into consideration the feedback you receive on the earlier draft.

**Due dates:**

- Submit preliminary draft of your mentoring philosophy to Avenue Dropbox by 11:59 pm on January 28th. ALSO bring a printed copy of your philosophy to class for peer-review on January 29th.
- Submit your final REVISED mentoring philosophy as part of your Mentoring Portfolio (see culminating assignment below).

**Research defense (10%)**

This assignment helps to develop skills in understanding and communicating experimental techniques, data analyses, and the presentation of scientific data. This is an essential skill in scientific research for thesis defenses, responding to referee comments on manuscripts and general interactions with your peers at conferences or laboratory meetings. The task is for a group to choose a peer reviewed scientific article, learn and understand experimental techniques and statistical analysis and be comfortable communicating the ideas behind the article to your peers. In class, half of the group will
“defend” the paper as the “researchers” and the other half will question researchers on their choices and critically evaluate the paper. The primary goals for this assignment are to use appropriate media, skills and dialogue to convey scientific information and gain an in depth understanding scientific methodologies and data representation and statistical analysis.

Due dates:

- *Research defenses in class the weeks of February 5 and February 12th, 2018.*

**Develop scientific research proposal to address a scientific issue within society (8%)**

For this assignment, you will be tasked with choosing a scientific based issue and developing a research proposal designed to address the issue. This assignment will test your ability in knowledge translation as you will be tasked with effectively communicating the literature and scientific reasoning to why the issue you have chosen is of importance to society. You will present your research proposal to the class orally. You will be challenged with educating your audience in an engaging and persuasive manor that will leave them with a deeper understanding of the scientific methodologies regarding your issue.

Due dates:

- *Present research proposals on March 5th and 12th.*

**Culminating Assignment: Mentoring Portfolio (35%)**

Your mentoring portfolio will draw upon your learning and practice in lecture and tutorial; it is where you will demonstrate your overall growth and learning as a peer-mentor. This assignment is grounded in your personal goal development and will draw from your practice notes that will assist you in building your portfolio. Throughout the semester you will document your learning experiences and evidence of achievement, which you will build into your portfolio. This assignment will be useful to you as you develop your career in science and interest in teaching and mentoring new learners. Upon the completion of the mentoring portfolio, you will have enhanced your skills as a reflective science mentor-practitioner, established personal mentor philosophies, and collected evidence of achievement from your practice.

Due date:

- *Submit your final Mentoring Portfolio by 11:59 pm on April 2nd, 2018.*

**In-Class Discussion, Participation, and Reflection (15%)**

*Weekly attendance in lecture, tutorial and part of the laboratory exercises are a mandatory aspect of this course.* You will be invited to discuss your written reflections and also comment on your peers’ open reflections. The purpose of these exercises is to help you practice your skills in listening and communicating with others, which is an essential part of your role as a mentor. This collegial environment will also contribute to your personal goal achievement and mentoring philosophy.

Due date:
Ongoing and regular contributions throughout semester

**Course Procedures**

**Absences & Missed Work:**

Students are expected to hand in all assignments on the specified due dates. Late submissions will be subject to a penalty of **10%** per working day. Late submissions may also receive less thorough feedback. Please note that late penalties will not be waived except in exceptional circumstances, with appropriate documentation and on an individual basis. Given that some course assignments require electronic submission, you should be sure to familiarize yourself with the Avenue to Learn in advance of the deadlines, and to ask for assistance as necessary. Problems with electronic submission WILL NOT be accepted as an excuse for late submission of assignments.

In accordance with University regulations, documentation is required for circumstances of health or emergency (see below). Exceptional circumstances do not include conflicting due dates or a busy schedule. No assignments will be accepted after the last day of classes.

If you are absent from the university for a minor medical reason, lasting up to 3 calendar days, you may report your absence, **once per term**, without documentation, using the McMaster Student Absence Form (MSAF). Absences for a longer duration or for other reasons must be reported to your Faculty office, with documentation, and relief from term work may not necessarily be granted. When using the MSAF, immediately report your absence to Dr. Leonard or Dr. Rodriguez Moncalvo by email (normally within 2 working days). Instructors will indicate what relief may be granted for the work you have missed, and relevant details such as revised deadlines, or time and location of a make-up exam/quiz/test. Please note that the MSAF may not be used for final deliverables, nor can it be used for a final examination or its equivalent.

Please read further details about the new MSAF policy here:

http://academiccalendars.romcmaster.ca/content.php?catoid=13&navoid=2208#Requests_for_Relief_for_Missed_Academic_Term_Work

**Checking Your Grades:**

Office hours with the Teaching Assistants will be arranged following the tests to review your test if you wish to do so. All grade concerns and discrepancies must be reported to Dr. Leonard or Dr. Rodriguez Moncalvo **within a week** of receiving the grade.

**Re-mark Policy:**

Requests for re-evaluation of exams must be made to the Instructors within **1 week** of the posting of grades and after reviewing your tests. Only exams that are fully written in non-erasable pens or are typewritten will be considered for remarking. All requests must be made in writing. Please be aware that an approval for a remark can result in an increase, decrease or no change to the original mark.
Communication between Students and Faculty:
The University’s official method of correspondence with students is through a valid McMaster University e-mail account. It is the student’s responsibility to keep his/her @mcmaster.ca account active and check it on a regular basis. All emails from students must include your full name, student #, and course code (LIFESCI 3YY3).

Student Responsibilities:
To get the most out of the course, you must be prepared to:
- attend all sessions, make up all missed work, and provide documentation for authorized absences;
- interact frequently with faculty, students, TAs, and other support staff;
- plan and manage your own time;
- complete preparatory tasks (such as reading, writing assignments, and initial research) in advance of sessions;
- develop and use reflective learning skills (for example identifying learning objectives, planning and carrying out research tasks, acting on academic feedback);
- work as an effective, efficient, and responsive team member on group assignments;
- follow all the guidelines as outlined in the Introduction section of the Laboratory Manual;
- check the course Avenue site, and your McMaster and Avenue e-mail daily for updates; and,
- follow all university policies and guidelines, and in all ways be a responsible university member.

Senate Student Policies
Students can view full policies here (http://www.mcmaster.ca/policy/Students-AcademicStudies/).
Senate Policy Statements are also available from the Senate Secretariat Office, Room 104, and Gilmour Hall.

Academic dishonesty consists of misrepresentation by deception or by other fraudulent means and can result in serious consequences, e.g. the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: "Grade of F assigned for academic dishonesty"), and/or suspension or expulsion from the university. It is your responsibility to understand what constitutes academic dishonesty.
The following illustrate only four of many forms of academic dishonesty:
- plagiarism, e.g. the submission of work that is not one's own or for which other credit has been obtained;
- copying or using unauthorized aids in laboratory exercises
- improper collaboration in group work; and
- copying or using unauthorized aids in quizzes, tests and examinations
All students are reminded of the importance of academic integrity, and the serious consequences of academic dishonesty.

Student Code of Conduct
You acknowledge that your behavior in all aspects of this course should meet the standards of the McMaster University Student Code of Conduct. You understand that any inappropriate behavior directed against any of your colleagues, teaching assistants, or the instructional team will not be tolerated. Disruptive behavior during any session (e.g. lecture, seminar, lab, tutorial) such as talking, sleeping or non-class computing while an individual presents information, or constantly being late, will also not be tolerated. Abuse, ridicule, slander, inappropriate language, and discrimination towards instructors teaching staff, teaching assistants and other students will not be tolerated in any capacity. Shared spaces including e-spaces such as the Avenue to Learn course discussion board are to be considered inclusive and safe.

**Plagiarism Detection**

In this course, we will be using a web-based service (Turnitin.com) to reveal plagiarism. Students will be expected to submit their work electronically to Turnitin.com and in hard copy so that it can be checked for academic dishonesty. Students who do not wish to submit their work to Turnitin.com must still submit a copy to the instructor. No penalty will be assigned to a student who does not submit work to Turnitin.com. All submitted work is subject to normal verification that standards of academic integrity have been upheld (e.g., on-line search, etc.). To see the Turnitin.com Policy, please go to [www.mcmaster.ca/academicintegrity](http://www.mcmaster.ca/academicintegrity).

**Copyright Policy**

In this course you will have access to material that is subject to copyright laws. This includes (but is not limited to) textbooks and all resources developed by the instructors such as lab manuals, demonstration videos, quizzes, assignments, tests, class notes and class slides. Under no circumstance are you allowed to share or redistribute this material in any printed or electronic form without the explicit written consent of the copyright holder. This includes posting any course material on Internet bulletin boards, course repositories, social networks, etc.

**The instructors and the university reserve the right to alter this outline if necessary.**

The instructors and university reserve the right to modify elements of the course during the term. The university may change the dates and deadlines for any or all courses in extreme circumstances. If either type of modification becomes necessary, reasonable notice and communication with the students will be given with explanation and the opportunity to comment on changes. It is the responsibility of the student to check their McMaster email and course websites weekly during the term and to note any changes.