Course Outline - Chemistry 4491E (2017-2018)

Chemical Research Discovery and Scientific Communication

Course Facilitators:
Prof. John F. Corrigan ChB 16 (Ground Floor)
Prof. Mark Workentin ChB 223

Please feel free to contact either of the course facilitators about any aspect of this course.

Course E-mail: jfcorig@uwo.ca or mworkent@uwo.ca

Follow on Twitter: @WesternuChem, @WorkentinChem or @CorriganLab and join the conversation.

Emails must be from your @uwo.ca address. Please put Chem 4491E in the subject line.

About the Course:
Chemistry 4491E is the capstone course in our Specialization and Honors Specialization in Chemistry and for some in the Honors Specialization in Biochemistry and Chemistry Modules. The course provides the student with the opportunity to integrate the breadth of knowledge gained in prerequisite courses and apply it towards a hands-on chemistry experience while doing an independent research project under the direction of a faculty member in the Department. The course involves experiential learning of advanced laboratory skills and techniques needed to do research in an active chemistry research group. Importantly, the course also includes a number of units dealing with professionalism in chemistry and science. The course culminates with the writing of a thesis summarizing the year's work. The research project is then presented and defended in a conference-based atmosphere to a panel of faculty examiners and peers.

Expectations:
The minimum requirements for this course are:

A) 15 hours/week in the laboratory throughout the entire school year working on your research project under the direction of your assigned supervisor. Please note that March 2, 2018 marks the end of your laboratory work. This is to allow enough time for proper thesis preparation.

B) Attendance at the Chem 4491E Professionalism Unit Presentations listed below (mostly Thursday afternoons at 1:30-3:30. Some dates and times may be subject to change. Participation in each is required for course credit. Failure to attend without a valid excuse will result in a failure (40%) in Chem 4491. Reserve this time in your schedule weekly.

Initiation Meeting: Thursday, September 7, 2017 1:30 -4:30 pm, Room CHB 115
Course initiation meeting, followed by the discussion of required Laboratory Safety courses that is followed by a mixer where students can discuss research projects with potential faculty supervisors in an informal setting.

Laboratory Safety: Students are required to complete a series of on-line laboratory safety training courses on-line. In addition, your supervisor will provide group-specific safety training.
**Professional Development Schedule**
NB: _tentative_ dates – any changes will be announced via email (OWL)

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<thead>
<tr>
<th>Event Description</th>
<th>Date</th>
<th>Time</th>
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<tbody>
<tr>
<td><strong>Graduation Audit</strong> Dr. Keith Griffiths, Assoc. Chair Bring your lap-top/iPad or student profile</td>
<td>Thursday, September 14</td>
<td>ChB 115 1:30 p.m.</td>
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<td><strong>Library Session</strong> Shiyi Xie</td>
<td>Thursday, September 22</td>
<td><strong>Kellogg Room, Taylor Library</strong> 1:30-3:00 pm or 3:00-4:30 pm TBA</td>
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<td><strong>Applying to Graduate Schools &amp; Applying for graduate scholarships</strong> John Corrigan and François Lagugne-Labarthe</td>
<td>Thursday, October 3</td>
<td>ChB 115 1:30 -3:00 pm</td>
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<td><strong>Self-Marketing on-line: Effect and Appropriate Use of Social Media</strong> Melissa Cheater</td>
<td>Thursday, October 26</td>
<td>ChB 115 1:30 -2:30 pm</td>
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<td><strong>ChemDraw Tutorial</strong> Paul Ragogna</td>
<td>Thursday, October 19</td>
<td>ChB 115 1:30 -3:00 pm</td>
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<td><strong>Self-Marketing on Paper: Resumes and Cover Letters</strong> Patricia Mason</td>
<td>Thursday, November 2</td>
<td>ChB 115 1:30 -3:00</td>
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<td><strong>Self-Marketing on-line: LinkedIn Workshop</strong> Lauren Starr</td>
<td>Thursday, November 9</td>
<td>**SH1310 1:30-3:00 pm</td>
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<td><strong>How to give a Scientific Presentation</strong> John Corrigan</td>
<td>Thursday, November 16</td>
<td>ChB 115 1:30 -2:30 pm</td>
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<td><strong>Mid-year (December) Research Project Progress Presentations</strong></td>
<td>Thursday November 30</td>
<td>ChB 115 or MSA 3204 TBA: 1:30-4:30</td>
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<td><strong>Resume and Interview Submission and Selection Absolute Deadline: must include complete LinkedIn profile</strong></td>
<td>Friday, January 5, 2018</td>
<td>*failure to meet this deadline = course failure</td>
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<td><strong>Self-Marketing in Person: Networking Interview Skills Workshop</strong> Patricia Mason</td>
<td>Thursday, January 11</td>
<td>1:30-3:00</td>
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<td><strong>Mock Interview Day</strong> <em>includes interview (45 mins total) and Networking Meeting 3:00-5:00 p.m.</em></td>
<td>Thursday, January 18</td>
<td>Student Success Centre UCC 210; Times TBA</td>
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<td><strong>Chemical Legalities; Mr. James Leech, B.Sc., M.Sc., L.L.B.</strong></td>
<td>Thursday, Feb 8</td>
<td>ChB 115 1:30-3:00 pm</td>
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<td><strong>Thesis Preparation Discussion</strong></td>
<td>Thursday Feb. 15 1:30-3:00 pm</td>
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<td><strong>SOUSCC – Laurier University</strong></td>
<td>Saturday, March 24 – All day (optional, but!)</td>
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<td><strong>Thesis Submission Deadline</strong></td>
<td>Thursday, March 29 12:00 p.m.</td>
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<tr>
<td><strong>Chemistry 4491 Presentation Day</strong></td>
<td>Saturday, April 7, 2018</td>
<td>8:00 am- 3:00 pm</td>
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Evaluation:
Assuming the minimum requirements as outlined above are met, the final grade in the course will be determined as follows:

Mid-year (December) Evaluation by Supervisor 5%
Assigned by supervisor(s) based on level of active participation in research activities. This includes an evaluation of achieving 15 hrs/week in the laboratory over the 12 weeks of term, the ability to integrate the skills learned and a demonstrated understanding of the project and research goals.

Mid-year Preliminary Thesis Introduction 5%
Due Date: December 15, 2017. A preliminary draft of the thesis introduction will be submitted to your supervisor(s) and on OWL. This is to ensure that you are thinking about the nature and scope of your research project. The exact length and content may change before the final thesis submission. Typically, an introduction will be 4-6 pages that survey the relevant background literature (properly referenced) and include a section of your objectives as related to the background.

Mid-year (December) Research Project Progress Presentation 5%
Each student will give a 5 minute maximum oral presentation outlining the thesis objectives and progress to date. Presentations will be the afternoon of Thursday, November 30.

Tweet Your Thesis: 2%
A minimum of two tweets (one in November and one in March) summarizing your 4491 research (include a graphic). MUST Tag @westernuchem Students will be assigned the date they must post.

Research Performance Grade 25%
This grade is assigned by the supervisor(s) based on the student’s research performance throughout the entire academic year.

Thesis: (2 x 15% from each of the two faculty examiners) 30%
Each student will submit a formal, written thesis (guidelines provided separately) by the due date. The thesis will be read and graded by two faculty members (who are not supervisors of the project). These grades are submitted to the coordinators prior to the Presentation and Oral Examination.

Examiners Grade for Oral Presentation (2 x 7%) 14%
Each student will present a 15 minute formal oral presentation. Your examiners will provide a grade based on the quality of the presentation.

Examiners Grade for Oral Examination (2 x 7 %) 14%
After the oral presentation there is 20 minutes of questions from the examiners. This grade reflects your level of knowledge and comprehension demonstrated during this examination.
Learning Outcomes:

• You will integrate skills and knowledge from core chemistry sub-disciplines and apply them to an independent research in an active research group
• As a part of the an active research group you will develop skills of working within a team
• You will develop a basic understanding of scientific literacy in the specific area of your research and articulate it in a public forum
• You will develop an understanding of scientific ethics as it relates to research experiments and dissemination
• In the project you will build hypothesis and plan experiments. You will then execute on this plan to design and perform experiments
• You will apply the knowledge built from your previous courses to interpret the results and learn to rationalize them in the context of your hypothesis and communicate this in a scientific way in the form of a written thesis
• You will further build communication skills though regular active participation in your research group and a year end oral presentation and defense of your research thesis
• You will develop professional career skills such as job application, interviewing and networking skills, advanced library skills, through a series of active learning/participatory events.