Research Techniques in Environmental Science

Wednesday, 2.30-5.30pm, NCB room # 105

Instructors: Maja Staniec, Ph.D. Andrea Boyer, Ph.D.
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Faculty of Science Faculty of Science
Department of Biology Department of Biology
University of Western Ontario University of Western Ontario
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Office: Collip Building, room 105 E By appointment only
Office hours: Friday, 9.30am-11.00 am (contact to make an appointment)

COURSE DESCRIPTION
This is a multi-module course intended to provide the theoretical and practical knowledge required by Environmental Science students to undertake independent research. Over the course of the semester, we will address conceptual and technical aspects of research, as well as all phases of the research process. Because this is an essay course, it will involve written assignments. This course is designed to guide you during the preparation of your research proposal, thesis, or project.

COURSE PREREQUISITES
Environmental Science 3300F/G or special permission of the program coordinator. Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you may be removed from this course, and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

COURSE FORMAT
Classes will be divided into two parts. The first part will include lectures, readings, videos and discussions. The second part of the class will be practical at which time you will put everything you just learned to practise, using tools including MS Office Excel, Word and PowerPoint. Group work and individualized learning will also take place at this time.

Most of the in-class exercises and assignments are built directly on the material preceding it and each constitutes a building block of the final product. For that reason, it is important that you keep the copy of all your assignments and in-class exercises for future reference, participate in each class, keep to the schedule, and not fall behind.

Students should check OWL (owl.uwo.ca) regularly for news and updates. This is the primary method by which information will be disseminated to all students in the class.

CLASS PARTICIPATION
You are expected to attend every class session. You will get from this course only as much as you put in. You need to take initiative and responsibility for your learning. You will be expected to demonstrate active engagement in the class. Excused absences require evidence of a valid medical or emergency reason (with Academic Counselor’s approval), or prior consultation with the instructor. Each unexcused absence will
result in a 10% drop of your attendance grade. Whether excused or unexcused absence you are responsible for work missed (this includes missed in-class exercises, presentations and research proposal deadlines) and you must arrange for any make-up work to be finalized before the following class. In case the make-up work was not arranged by you before the following class (within six days since the missed class or deadline), you will receive 0% for the missed requirement.

CLASSES SCHEDULE
The schedule presented here is meant to highlight important due dates and to give you an idea of what activities are planned for each class. The lecture topics, layout and deadlines may change as the semester develops. The in-class exercises need to be submitted individually to OWL before following Friday 9am (unless stated otherwise). All other assignments must be submitted individually to OWL before their deadline.

<table>
<thead>
<tr>
<th>Class</th>
<th>Part I</th>
<th>Part II</th>
<th>Assignments</th>
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<tr>
<td>Class 1</td>
<td>January 10, 2018</td>
<td>✓ Introduction to the course ✓ Research - step 1: Formulating a research problem, p.1/2</td>
<td>✓ Word: Structure of a research proposal, p.1/3 In-class exercise #1</td>
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<td>Class 2</td>
<td>January 17, 2018</td>
<td>✓ Research - step 1: Formulating a research problem, p.1/2</td>
<td>✓ Word: Organizing the structure of a research proposal, p.2/3 In-class exercise #2</td>
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<td>Class 3</td>
<td>January 24, 2018</td>
<td>✓ Group presentations of research topics and conceptual framework ✓ Research - step 2: Conceptualising a research design, p.1/2</td>
<td>PPT Presentation #1 Research Proposal #1</td>
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<td>Class 4</td>
<td>January 31, 2018</td>
<td>✓ Research - step 2: Conceptualising a research design, p.2/2</td>
<td>✓ Excel: Time management - Gantt chart In-class exercise #3</td>
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<td>Class 5</td>
<td>February 7, 2018</td>
<td>✓ Research - step 3: Constructing an instrument for data collection ✓ Research - step 4: Selecting a sample</td>
<td>✓ Word: Organizing the structure of a research proposal, p.3/3 In-class exercise #4</td>
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<td>Class 6</td>
<td>February 14, 2018</td>
<td>✓ Research - step 5: Writing a research proposal</td>
<td>✓ Excel: sample size, budget In-class exercise #5</td>
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<td>Class 7</td>
<td>February 28, 2018</td>
<td>✓ Research - step 6: Collecting data</td>
<td>Excel: Data entry, anticipated results</td>
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<td>Class 8</td>
<td>March 7, 2018</td>
<td>✓ Group consultations</td>
<td>Research Proposal #2</td>
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<td>Class 9</td>
<td>March 14, 2018</td>
<td>✓ Research - step 7: Processing and displaying data</td>
<td>✓ Excel: Data analysis, Statistics In-class exercise #6</td>
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<td>Class 10</td>
<td>March 21, 2018</td>
<td>✓ Research - step 8: Writing a research report ✓ How to prepare a good presentation</td>
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<td>Class 11</td>
<td>March 28, 2018</td>
<td>✓ Awards and graduation ceremony ✓ Group consultations</td>
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<td>Class 12</td>
<td>April 4, 2018</td>
<td>✓ Group presentations of research proposals (PPT #2), p.1/2</td>
<td>Research Proposal #3 PPT Presentation #2</td>
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<td>Class 13</td>
<td>April 11, 2018</td>
<td>✓ Group presentations of research proposals (PPT #2), p.2/2</td>
<td>PPT Presentation #2</td>
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COURSE EVALUATION

In-class exercises: (30%) various in-class exercises include organizing the research proposal structure, data management and analysis.

Presentation 1: Research topic and conceptual framework (5%), January 24th, 2018 (in class)
Group presentation of all proposed research topics, their concepts + choice of the research proposal topic.

Research proposal 1: Introduction, Literature review (10%), due January 24th, 2018, 2pm
Based on a short literature review formulate a research problem, identify the variables and construct a hypothesis with objectives. Prepare the context within which your study is important. Includes conceptual framework.

Research proposal 2: First draft of research proposal (10%), due March 7th, 2018, 2pm
This should be a complete proposal with proper document layout, including an abstract, literature review, detailed research design, hypothesis, objectives and context within which your study is important. This must include an overall description of research method and study design, discussion of methods and instrument of data collection, sample choice, a time-line, budget, bibliography, etc. You should also include a description of what is still missing and will be done at later stage; however, you should endeavor to make the first draft as complete as possible. All previous comments must be addressed.

Research proposal 3: Final version of research proposal (20%), due April 4th, 2018, 2pm
This is the culminating product of the course which includes - in an integrated and thoroughly edited document - everything you have been working towards in the course. It should include detailed and revised information included in the first draft of your research proposal. This must include a sample of a designed experiment, survey or questionnaire, time-line, limitations, bibliography, appendices (if any), etc. All previous comments must be addressed.

Presentation 2: Research proposal (20%), April 4th and April 11th 2018 (in class)
Group presentation of final research proposal.

The grade-point values of some of the assignments (e.g., 5% for the first presentation) may seem disproportionately small compared to the amount of work you will be doing for these. However, the grade is meant more as an incentive to keep you working on schedule, and as an indication ‘in miniature’ of the grade level at which you are operating. The final product in the course will be your research proposal, and it is possible that your grades for earlier written work may be revised ‘upward’ based on the quality of the final draft proposal. However, without consistent work on all the parts of the proposal (and, therefore, on all written assignments), you will risk failure to complete the proposal on time.

Relative grade breakdown:

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<tbody>
<tr>
<td>Participation</td>
<td>10%</td>
<td>Attendance and engagement</td>
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<tr>
<td>In-class exercises</td>
<td>30%</td>
<td>Various in-class exercises</td>
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<tr>
<td>Research proposal #1</td>
<td>10%</td>
<td>Introduction, Literature Review</td>
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<tr>
<td>Research proposal #2</td>
<td>10%</td>
<td>First draft of research proposal</td>
<td></td>
</tr>
<tr>
<td>Research proposal #3</td>
<td>20%</td>
<td>Final draft of research proposal</td>
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<tr>
<td>Group presentation #1</td>
<td>5%</td>
<td>Research Topic + Conceptual Framework</td>
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<tr>
<td>Group presentation #2</td>
<td>15%</td>
<td>Research proposal</td>
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<tr>
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<td>100%</td>
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NOTE

The above course schedule, requirements, and due dates are subject to change. Any changes will be announced in class. If you have any concerns, please speak about this with the main instructor early on in the course - do not leave such concerns to the last minute.

COURSE MATERIALS


CONDUCT

I expect professional conduct from all students, and in turn, you can expect professional conduct from me and the TA. This includes doing your own work, helping others during lab times, and not disrupting others during class. You may use computers for in-class exercises, but not for other activities. No using cell phones, e-mailing, texting, social networking, checking websites, watching videos, etc. unless I ask you to. These activities are distracting to others in the class who can see your screen.

To ensure a speedy response, be considerate and professional in your e-mails; harassment will not be tolerated. Begin your e-mail with a salutation (“Dear Dr. Staniec”) and end with an identifier of who you are (“Jane”). Remember that these are permanent records of your interactions with your professor and TA. E-mails will be answered on a first come, first served basis and every attempt will be made to respond within 3 working days. Do not expect a response outside of regular working hours, on weekends or holidays.

You may use non-sanctioned apps for course-related discussion, but do remember that these are not monitored by me or TA, and their focus may miss the mark when it comes to the independent assessments.

ACADEMIC OFFENCES

You are responsible for reading and understanding university policies and terminology related to academic misconduct. Note that answers that are submitted in response to a question on a previous year’s assignment, rather than this year’s assignment, will not receive any credit. Making up data constitutes academic fraud.

Scholastic offences are taken seriously, and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site: http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf.

Examples of scholastic offences include copying answers, plagiarism, and submission of your work for credit in multiple classes. Cheating and plagiarism checking software will be used to check for unusual coincidences in answers.

“Computer-marked multiple-choice tests and/or exams may be subject to submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating.”
“All required papers will be subject to submission for textual similarity review to the commercial plagiarism detection software (Turnitin) under license to the University for the detection of plagiarism. All papers submitted will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com.”

Any accusation of academic misconduct will be made on a case-by-case basis and will be based on all evidence that can be gathered (including incriminating activity on non-sanctioned apps). All cases of academic misconduct will be reported to the Undergraduate Chair in the Department of Biology. The penalty for an academic offence will be determined on a case-by-case basis. Academic offences come with the maximum penalty of failing the course and a permanent record in your transcript.

ACCOMMODATION
If you are unable to meet a course requirement because of medical or personal reasons or a heavy exam load, you must obtain valid medical or other documentation and provide it to an Academic Counselor (located in the Dean’s office of your faculty) as soon as possible. You also must inform me within 48 hours. Without approval from an Academic Counselor, you will receive 0% for the missed requirement. For further information, see:
www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_illness.pdf
http://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_religious.pdf

For missing the deadline for the FINAL Research Proposal Presentation because of a medical or other serious excuse (with Academic Counselor’s approval), an appropriate extension will only be granted if the absence occurred during April 2 – April 8.

UWO ACCESSIBILITY STATEMENT
Please contact me if you require material in an alternate format or if you require any other arrangements to make this course more accessible to you. I may direct you to the Services for Students with Disabilities (SSD) at 661-2111 x 82147.
www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_disabilities.pdf

STATEMENT ON USE OF ELECTRONIC DEVICES
During the classes please do not work on your own laptops - work on the desktop computers in the lab.

SUPPORT SERVICES
Registrar Services: http://www.registrar.uwo.ca
Student Support Services http://westernmusc.ca/services/
Learning skills services at the Student Development Centre: http://www.sdc.uwo.ca

Students who are in emotional/mental distress should refer to Mental Health @ Western for a complete list of options about how to obtain help.
http://www.uwo.ca/uwocom/mentalhealth/

APPEALS
Grades are earned, and, in the interest of fairness, additional points will not be granted because you need a certain GPA or because you expected better performance. I will round grades to the nearest integer (79.5% will become 80%; 79.4% will become 79%). I will let you know in class when graded assignments will be available for viewing. See UWO’s policies on academic appeal for further information.