

## Communicating Research in Engineering Summer 2019

**Course dates:** July 15-August 23, 2019

**Course length:** 6 weeks

**Date / Time:** Mon & Wed (2.30-5pm), Aug 5 will be rescheduled

**Location:** UCC 1110

### Names and Contact Details

**Course Instructor:** Dr. Olga Kharytonava

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### Communication of Additional Information:

Course information will be announced in class and/or on OWL.

### Course Description:

This course aims to assist graduate students in their preparation for conducting research by guiding them through the logic of the research process. A specific focus of this course is on developing students' critical thinking at every stage of their research process and communicating their research plan and (preliminary) results to different types of audiences. Upon completing this course, students should be able to clearly articulate their research plan from a critical perspective both orally and in writing. Students will also learn how to critically assess the work of their peers and provide constructive feedback following best practices.

### Delivery Method:

The course is comprised of 12 classes (2.5h each twice a week) organized in 6 modules. The course will use the following methods:

*Flipped Classroom:* Students will be required to watch a 10-15 min lecture video explaining the key concepts *before class*, complete a short self-assessment quiz and prepare actions items listed for that class. In-class work will consist of putting the lecture material to practice.

*Class Discussion:* Students will be required to actively engage in class and complete the regular take-home tasks.

*Group Work:* Students will be required to effectively collaborate with their groupmates on class or take-home tasks.

### Materials:

There is no textbook for this course. All materials will be available in class and on OWL.

***Mandatory course requirements and Evaluation:***

Students are expected to attend all classes and to complete the required tasks on time. In the case of absence, they are required to inform their instructor. They will still be marked as absent and are responsible to cover the missed material. Students will be required to complete assignments for every class with a satisfactory grade. The assignments include quizzes, both oral and written work which are outlined in the Learning Objectives.

***Workload:***

The students will be required to complete tasks for every class. It is expected that students spend 1-2h to prepare for every class in addition to the regular class hours. The tasks will be directly applicable to students' current graduate work and research.

***Learning Objectives:***

By the end of this course students will be able to:

- describe their research area, hypothesis and research objectives
- identify and assess ethical considerations in their research area
- formulate and present their assumptions, strengths and limitations
- outline the research and writing plan
- summarize the literature review from the critical perspective
- clearly present the gap in literature and the need for their research
- integrate literature into their writing
- identify the type of audience for oral presentation/written paper
- outline a paper and an abstract for a specific type of audience
- evaluate the effectiveness of visual aids (e.g. figures/tables)
- provide a clear and concise explanation of the figures/tables orally and in writing
- write an outline for a conference paper
- present their research in a 3 min presentation to a non-technical audience
- outline a conference presentation
- deliver a 5 to 15 min presentation to their peers
- provide constructive feedback on presentation skills

**Course Content:**

*The course content may be adjusted as needed throughout the term.*

|               |                 |   |
|---------------|-----------------|---|
| <b>Week 1</b> | <b>Module 1</b> | <b>Understanding Research</b>             |
|               | <i>Class 1</i>  | <i>Research Question &amp; Hypothesis</i> |

**HW Video:**

- What is research?
- Why do we do research?
- How to formulate an original research question?
- How to plan a research project?

**In-Class:**

Describe your research area: what is known  
Formulate & present your research question  
Outline the preliminary plan of research project

*Class 2*

*Ethical Norms and Academic Integrity*

**HW Video:**

Ethical norms in conducting research  
Academic norms in presenting research

**In-Class:**

Identify and assess ethical considerations in your own research  
Formulate & present your assumptions, strengths & limitations  
Modify/adjust the research plan

**Week 2    Module 2    Critical Literature Review**

*Class 3*

*Building Critical Literature Review*

**HW Video:**

Why do a literature review?  
Identify gaps & limitations in previous work

**In-Class:**

Synthesize previous work  
Formulate & present gaps in literature

*Class 4*

*Integrating Critical Literature Review and Referencing*

**HW Video:**

Reference style & citation manager  
Integrating literature into the logic of your argument

**In-Class:**

Integrate citations in writing

**Week 3    Module 3    Foundations for Technical Writing**

*Class 5*

*Outlining a Model Paper*

**HW Video:**

Outline a model publication  
Map the outline of your own paper

**In-Class:**

Identify the structural and linguistic elements of a model writing  
Match the outline of the peers' paper to the project model

*Class 6*      *Writing/Presenting to Different Types of Audiences*

**HW Video:**

How to recognize different types of audiences

**In-Class:**

Identify the audience for writing

Identify the formality of writing

Identify and apply the language of technical writing

**Week 4      Module 4      Presentation of Results: Effective Figures/Tables**

*Class 7*      *How to Create and Present Results Orally*

**HW Video:**

Different ways to present information

How to create effective figures?

How to present the results orally?

**In-Class:**

Evaluate the effectiveness of figures/tables

Present the figures/tables orally

*Class 8*      *How to Cite and Explain in Writing*

**HW Video:**

How to present the results in the text body?

**In-Class:**

Present the explanation of results in writing

**Week 5      Module 5      Communication of Research Outcomes - Writing**

*Class 9*      *Preparing and Presenting Research at Conferences*

**HW Video:**

How to write an effective abstract for a conference?

**In-Class:**

Prepare an outline for a conference abstract

*Class 10*      *Writing a Conference Paper*

**HW Video:**

How to write a conference paper?

**In-Class:**

Write an outline for a conference paper

**Week 6      Module 6      Communication of Research Outcomes - Oral**

*Class 11*      *Preparing and Presenting a Poster*

**HW Video:**

How to prepare an effective poster?

How to present an effective poster?

**In-Class:**

Prepare and present a 3 min thesis

*Class 12*

*Preparing and Presenting a Podium Presentation*

**HW Video:**

How to prepare an effective podium presentation

**In-Class**

Outline the conference presentation

Course Wrap up

**Writing Support Centre**

Students are also encouraged to make use of the UWO Writing Support Centre.

<http://www.sdc.uwo.ca/writing/>