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 additional 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.
Week 1  Module 1  Understanding Research
Class 1  Research Question & Hypothesis
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/