

MECH 550X: RESEARCH WRITING IN THE APPLIED SCIENCES
JANUARY-APRIL 2019
COURSE OUTLINE AND SYLLABUS

Instructor

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Time and Location

Lectures/workshops: TBD
Tutorial (optional): TBD

Course Description

This seminar is designed to help students improve the written and oral presentation of their work. Students will learn how to translate their research into logical, persuasive, and impactful documents, and into engaging and memorable presentations. We will deconstruct existing research articles to determine the elements of successful academic writing, and then apply this by workshopping selections from each student's own work. Students will receive extensive feedback throughout the course, from both the course instructor and their peers, and will end the term by producing an article and giving a presentation on their research.

Learning Outcomes

Upon completion of this course, students should be able to:

- Identify the needs of an audience and frame their research accordingly; describe their research in multiple ways, for audiences with different levels of understanding
- Identify issues with grammar, style, and organization in both their own work and others' and know how to avoid and correct these issues
- Use the campus library and online directories to research a problem, and evaluate the credibility and usefulness of sources
- Engage with others' research productively and ethically; distill a large body of research into a concise and relevant literature review with proper citations
- Formulate an insightful and informed argument and know when and how to use warrants to link that argument to supporting evidence
- Understand the major sections of an academic article and structure research documents appropriately
- Provide useful feedback on another's work, including identifying weaknesses in argument and flaws in logic
- Engage a conference audience by presenting a digestible amount of information at a suitable level of complexity, and using the most effective visual aids and speech practices

Course Format

Mech 550X is a 3-credit course, with classes twice per week. Most weeks will involve one lecture and one workshop. Students are expected to come to class prepared and to participate in class discussions and workshops. In addition to the two weekly classes, there is an optional tutorial once per week in which students can bring in their own work for feedback from the instructor and other students.

Evaluation and Grading

Students will be required to produce four written assignments and give two presentations over the course of the term.

Written Assignments

The four written assignments—research statement; literature review; introduction/outline; and final research article—should all be on the same topic and each one should build off the last. Students must identify a broad topic within the first two weeks, and inform the instructor of this topic in the research statement. Students are welcome and encouraged to use their thesis or dissertation topics, but they may also use a topic they are researching or have researched for another class, or an entirely new topic to research “from scratch.” Students should make sure to choose a topic that is (1) manageable (e.g. an entire thesis project is too large for one 5000 word research paper, so the topic should be narrowed) and (2) able to be turned into a full and conclusive paper (e.g. if the research question cannot be answered without doing a certain experiment, the student must have the means to perform that experiment). Students who are enrolled in the thesis or dissertation course are encouraged to consult with their supervisor before choosing a topic.

Presentations

Students will present a brief literature review and summary of their research question to the class in week 7. This presentation is informal and will not be graded; its purpose is to give students an idea of what their peers are working on and provide the opportunity for initial feedback from the class. The second and final presentation, which is graded, will be in the format of the “Three-Minute Thesis” (3MT). This presentation should summarize the research paper in a way that is understandable and engaging to an audience outside the discipline.

Allocation of marks

Description	Marks	Due Date
Research statement	5	January 14
Literature review and research question	10	February 11
Introduction and outline	20	March 11
3MT presentation	25	March 25
Research article (5000 words)	40	April 12

Readings

Required readings

Each week we will review an example of an exemplary article in the field. Information on each week’s article can be found in the “Schedule of Topics” below. All articles will be accessible through the UBC Library’s online database or provided to students via Canvas. Students are required to have read the week’s article **before** class and to bring a copy of it to class.

Recommended texts

The following texts reinforce the material we will cover in lecture and provide additional examples that students may find useful:

Booth, W. C., Colomb, G. G., & Williams, J. M. (2008). *The Craft of Research* (3rd ed). Chicago, IL: Chicago University Press. [Available online through the UBC library]

Hofmann, A. H. (2017). *Scientific Writing and Communication: Papers, Proposals, and Presentations* (3rd ed). New York, NY: Oxford University Press.

Strunk, W., & White, E. B. (2000). *The Elements of Style* (4th ed). Boston, MA: Allyn and Bacon. [Earlier editions available online through the UBC library]

Schedule of Topics

Week 1 (January 3): Introduction; writing for different audiences

Required readings:

1. Small, Meredith F. "Owing a Written Explanation to the Widest Possible Audience." *The Chronicle of Higher Education*. November 2000

Recommended readings:

1. *The Craft of Research*, Chapters 2-4

Week 2 (January 8, 10): Word choice: Grammar, style, tone, and voice

Required readings:

1. TBD

Recommended readings:

1. *Elements of Style* (full text)
2. *Scientific Writing and Communication*, Part I

Week 3 (January 15, 17): Incorporating past research; literature reviews

Required readings:

1. TBD

Recommended readings:

1. *The Craft of Research*, Chapters 5-6
2. *Scientific Writing and Communication*, Part II

Week 4 (January 22, 24): Formulating a research question and developing an argument

Required readings:

1. TBD

Recommended readings:

1. *The Craft of Research*, Chapters 7-8

Week 5 (January 29, 31): Supporting your claim with evidence and warrants

Required readings:

1. TBD

Recommended readings:

1. *The Craft of Research*, Chapters 9-11

Week 6 (February 5, 7): Presenting your work: From the "elevator pitch" to the conference presentation

Required readings:

1. TBD

Recommended readings:

1. *Scientific Writing and Communication*, Part V

Week 7 (February 12, 14): *Class presentations of literature reviews and research questions*

No readings for this week

[READING WEEK – February 18-22]

Week 8 (February 26, 28): *Structuring a research document; standard sections; flow*

Required readings:

1. Wright, T. M., J. A. Buckwalter & W. C. Hayes. "Writing for the Journal of Orthopaedic Research." *Journal of Orthopaedic Research* 17: 459-466. 1999.
2. TBD

Recommended readings:

1. *The Craft of Research*, Chapters 12-16
2. *Scientific Writing and Communication*, Part III

Week 9 (March 5, 7): *Summarizing your work; abstracts*

Required readings:

1. TBD

Recommended readings:

1. *Scientific Writing and Communication*, Chapter 15

Week 10 (March 12, 14): *Editing your work*

Required readings:

1. TBD

Recommended readings:

1. *The Craft of Research*, Chapter 17
2. *Scientific Writing and Communication*, Chapter 16

Week 11 (March 19, 21): *Workshops*

No readings for this week

Week 12 (March 26, 28): *Final presentations I*

No readings for this week

Week 13 (April 2, 4): *Final presentations II*

No readings for this week