McMaster University | Engineering

Technical Communications

CHEMENG 735 Course Outline

Brief Description:

An important part of engineering for career-oriented graduate students is communicating ideas and findings in a meaningful way to different audiences (eg. senior leaders, exam committees, technical peers, domestic versus international bodies, and laypersons). Communications is a skill and that requires mentoring and practice to develop. This course will guide students on how to write and present scientific ideas from their research to make effective journal articles, presentations, executive summaries, grants and idea/product pitches.

Lecture Time/Day: Friday afternoons 1:30-4:30, Winter Term.

Location: BSB B142

Bringing a laptop or tablet to class is required to do in-class assignments.

Instructors:

Todd Hoare, hoaretr@mcmaster.ca

Michael Thompson, mthomps@mcmaster.ca

Recommended materials:

Avenue2Learn e-learning modules: "Technical Communications for Graduate Students" (found by searching under 'Discover' from the top menu). Also found on the eCampus Ontario website:

https://vlslibrary.ecampusontario.ca/item-details/#/3ba70f32-bcbb-4b14-89be-859da1b90d7d?k=technical%20communications&itemTypes=6&itemTypes=12&sortCol=2&nextPage=true&page=1&collections=CVLP%20Collection&collections=VLS%20Collection

Essential requirements of the course:

As a technical communications course, public speaking to an audience, writing reports and peer networking are all critical elements, which means that regular attendance, on-time submission of reports and giving oral reports/presentations in front of the whole class will be essential to completing this course. These skills cannot be developed without

recognizing who is your audience and delivering your message directly to them. Students cannot receive exemptions from either writing or publicly speaking in this course.

Policy on Generative AI:

Students should gain comfort using generative AI tools to prepare for their future careers, but as is true of any engineering activity, *students are solely responsible for what is produced and submitted for evaluation*. Using these tools is appropriate for this course; however, remember that the purpose of this course is for the student to gain skills in effective communication and good judgement in tailoring communications to the correct audience, which includes developing knowledge about when assistive tools are useful or will fail. Students are warned that current generative AI tools cannot produce passable technical papers and often use incorrect grammatical rules since they were not trained exclusively on scientific reports. The instructors of the course will not be relying on plagiarism tools* to detect AI content but don't need to since the produced work is rarely acceptable by the standards of the scientific community. * Turnitin may still be used to detect plagiarism for certain assignments, but AI detection will be ignored.

Grading and Attendance

The mantra of the course is practice, practice, practice. A student will be evaluated repeatedly throughout the course on how clearly they write at a highly technical level, grasp the generally accepted rules on preparing presentations, orally convey their most significant ideas to an audience, and demonstrate the capacity to adjust as the audience changes from peers, to industrial persons or different industries, and to the general public.

Writing Assignments (5 activities)	25%
Presentation Assignments (5 activities)	25%
Oral Assignments (2 activities)	25%
Final presentation	25%
	100%

* As a new course, we reserve the right to alter the number of activities under each category but students will always be notified in advance of changes.

Regular attendance is expected at the class. There will be no participation mark nor attendance taken but since most lectures are expected to include some in-class evaluated task, one's absence will be obvious and marks will be lost. Students who cannot attend a specific lecture are expected to notify BOTH instructors 1-2 days in advance and should expect to make up any missed evaluations in the following class. Students who are unable to attend at least 80% of the classes shall be recommended to drop the course since it will be unlikely that they can fully obtain the benefits of the course.

Method of Instruction

Gaining skills in technical communication is greatly reliant on practice. During class lectures, students should expect to participate in writing or oral activities, with constructive feedback to be given by the instructors and peers in a timely and professional manner. Students will be expected to review module(s) from the e-learning course in AVENUE and any assigned materials prior to each lecture. The two instructors both have extensive publication histories and will be relaying their best practices and experiences in the lectures rather than focusing on dry material, which makes preparation before attending all the more important by students.

To maintain a supportive, stress-free, comfortable class environment for the practice of technical communications, lectures will NOT be recorded by either the students or instructors unless it is mandated by Student Accessibility Services for a specific student; if individual recording is required, that person will be required to keep any recording private and may only use it for personal learning.

This course does not cover grammar. Students seeking assistance should refer to the resources mentioned in the first module of the e-learning course.

Class Agenda (tentative)

1. Art and Science of Persuasion (1 day-Thompson).
    a. Identify diverse groups or individuals that make up an audience and their different levels of interest and background knowledge on a topic
    b. Define the purpose of your message to build emotional investment in the topic
    c. Create structure by providing a logical flow and a clear message
    d. Apply context, making the topic relatable to the audience through recognizable events and familiar values
    e. Cover additional topics on paragraphs, tenses, abbreviations and choosing your voice
2. Audience Analysis (1 day-Thompson)
    a. Understand the purpose of audience analysis as an effective communication tool for crafting or adapting a message based on a common ground shared with the audience
    b. Recognize the importance of understanding the socio-demographic makeup of an audience to determine their knowledge of a topic
    c. Recognize the importance of understanding the psychographic makeup of an audience to identify their needs
    d. Identify the factors that can influence attention span when communicating a message

3. Writing for Publications (~2 days-Hoare)

    a. Create useful and relevant hypotheses or objective statements
    b. Develop a literature review by presenting significant content, identifying the challenges in your area of study, recognizing disputed thinking, and identifying gaps
    c. Convey the significance of your work including what it is, why it should be undertaken, and how it will be carried out
    d. Recognize and apply different genre and disciplinary writing conventions (when to use past and present tense or active and passive voice)
    e. Prepare key parts of a publication (focusing on abstracts, introductions, and conclusions) using writing guidance for the major disciplines

4. Navigating the Publication Process (1 week - Hoare)
    a. Create effective cover letters to convince an editor to send your paper out for review
    b. Develop effective highlights, graphical abstracts, and impact statements to communicate the importance of your work
    c. Understand acceptable and not acceptable uses of AI in preparing your manuscript relative to journal policies and how journals use AI to evaluate your manuscript
    d. Draft effective responses to reviewers and communications with editors/journal offices

5. Writing Grants, Industrial Project Proposals and Reports (~2 days-Thompson)
    a. Establish and convey the main ideas of your proposed work, and invoke interest and engagement in the reader
    b. Identify and present convincing arguments for the undertaking of the project, as well as methodologies
    c. Identify, analyze and review the literature that concerns the arguments for your proposed project by illustrating a wide interest in the topic
    d. Identify and emphasize relevant and new methods that indicate a good foundation for your project as well as the novelty of your methods
    e. Evaluate findings (your results, data, or conclusions) and provide support references for the validation
    f. Develop conclusions that briefly and succinctly summarize the project findings

6. Presentation and Visualization of Data (1 day-Hoare)

    a. Identify best practices for creating a research poster with visual impact, clarity and ease of navigation
    b. Prepare effective figures for both presentations and papers

7. How to Give an Oral Presentation (~1 days-Thompson)

    a. Understand your given audience and determine what level of abstraction or level of technicality is appropriate
    b. Determine the purpose or message of your presentation – what are the main ideas/concepts the audience should learn
    c. Structure a presentation
    d. Identify the context for creating the presentation – standard presentation, keynote presentation, plenary presentation, or determining the choice of voice

8. How to Share Your Research with Non-Experts (1 day-Hoare)
    a. Understand the basics of lay scientific communication
    b. Learn to create effective articles, perspective articles, or social media posts promoting your research
    c. Develop strategies for discussing your work with the media or in public venues

9. Final Presentations (1 day-Hoare/Thompson)

GENERAL UNIVERSITY POLICIES

ACADEMIC INTEGRITY

You are expected to exhibit honesty and use ethical behaviour in all aspects of the learning process. Academic credentials you earn are rooted in principles of honesty and academic integrity. ***It is your responsibility to understand what constitutes academic dishonesty.***

Academic dishonesty is to knowingly act or fail to act in a way that results or could result in unearned academic credit or advantage. This behaviour can result in serious consequences, e.g. the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: "Grade of F assigned for academic dishonesty"), and/or suspension or expulsion from the university. For information on the various types of academic dishonesty please refer to the Academic Integrity Policy, located at:

https://secretariat.mcmaster.ca/university-policies-procedures-guidelines/

The following illustrates only three forms of academic dishonesty:

•plagiarism, e.g. the submission of work that is not one's own or for which other credit has been obtained.

•improper collaboration in group work.

•copying or using unauthorized aids in tests and examinations.

AUTHENTICITY/PLAGIARISM DETECTION

Some courses may *use a web-based service (Turnitin.com) to reveal authenticity and ownership of student submitted work. For courses using such software, students will be expected to submit their work electronically either directly to Turnitin.com or via an online learning platform (e.g. A2L, etc.) using plagiarism detection (a service supported by Turnitin.com) so it can be checked for academic dishonesty.*

Students who do not wish their work to be submitted through the plagiarism detection software must inform the Instructor before the assignment is due. No penalty will be assigned to a student who does not submit work to the plagiarism detection software. ***All submitted work is subject to normal verification that standards of academic integrity have been upheld*** *(e.g., on-line search,*

other software, etc.). For more details about McMaster's use of Turnitin.com please go to www.mcmaster.ca/academicintegrity.

COURSES WITH AN ON-LINE ELEMENT

***Some courses may** use on-line elements (e.g. e-mail, Avenue2Learn (A2L), LearnLink, web pages, capa, Moodle, ThinkingCap, etc.). Students should be aware that, when they access the electronic components of a course using these elements, private information such as first and last names, user names for the McMaster e-mail accounts, and program affiliation may become apparent to all other students in the same course. The available information is dependent on the technology used. Continuation in a course that uses on-line elements will be deemed consent to this disclosure. If you have any questions or concerns about such disclosure please discuss this with the course instructor.*

CONDUCT EXPECTATIONS

*As a McMaster student, you have the right to experience, and the responsibility to demonstrate, respectful and dignified interactions within all of our living, learning and working communities. These expectations are described in the Code of Student Rights & Responsibilities (the "Code"). All students share the responsibility of maintaining a positive environment for the academic and personal growth of all McMaster community members, **whether in person or online**.*

It is essential that students be mindful of their interactions online, as the Code remains in effect in virtual learning environments. The Code applies to any interactions that adversely affect, disrupt, or interfere with reasonable participation in University activities. Student disruptions or behaviours that interfere with university functions on online platforms (e.g. use of Avenue2Learn, MS Teams or Zoom for delivery), will be taken very seriously and will be investigated. Outcomes may include restriction or removal of the involved students' access to these platforms.

ACADEMIC ACCOMMODATION OF STUDENTS WITH DISABILITIES

Students with disabilities who require academic accommodation must contact Student Accessibility Services (SAS)at 905-525-9140 ext. 28652 or sas@mcmaster.ca to make arrangements with a Program Coordinator. For further information, consult McMaster University's Academic Accommodation of Students with Disabilities policy.

REQUESTS FOR RELIEF FOR MISSED ACADEMIC TERM WORK

There is no Student Absence Form (MSAF) system at the graduate level. In the event of an absence for medical or other reasons, students should contact either instructor of the course as soon as the student is able and recognizes they can not submit evaluated work on time.

ACADEMIC ACCOMMODATION FOR RELIGIOUS, INDIGENOUS OR SPIRITUAL OBSERVANCES (RISO)

Students requiring academic accommodation based on religious, indigenous or spiritual observances should follow the procedures set out in the RISO policy. Students should submit their

request to their instructor or departmental office ***normally within 10 working days*** *of the beginning of term in which they anticipate a need for accommodation. Students should also contact their instructors as soon as possible to make alternative arrangements for classes, assignments, and tests.*

COPYRIGHT AND RECORDING

Students are advised that lectures, demonstrations, performances, and any other course material provided by an instructor include copyright protected works. The Copyright Act and copyright law protect every original literary, dramatic, musical and artistic work, ***including lectures*** *by University instructors. The recording in the class by students is not permitted without permission since all participating students should feel comfortable speaking and presenting their thoughts without wondering where recording may pop-up on the internet. Recording of student presentations by the instructors will be for the purpose of a student improving their performance and shall not be shared with other students or outside the course without their permission. Students should be aware that their voice and/or image may be recorded by others during the class. Please speak with the instructor if this is a concern for you.*

EXTREME CIRCUMSTANCES

The instructor and university reserve the right to modify elements of the course during the term. The university may change the dates and deadlines for any or all courses in extreme circumstances. If either type of modification becomes necessary, reasonable notice and communication with the students will be given with explanation and the opportunity to comment on changes. It is the responsibility of the student to check their McMaster email and course websites weekly during the term and to note any changes. Changes will be communicated through regular McMaster communication channels, such as McMaster Daily News, A2L and/or McMaster email.