

In this course we will discuss two central issues to engineering: Communication and Problem Solving Skills. Engineering is very much about technical communication. No matter how good your ideas are, to be a successful engineer you must be able to convey your ideas to your audience. This is the first in a series of courses that will improve your abilities and your confidence in your written and verbal communication skills. We also want to improve your ability to find literature on a scientific topic, and to develop your confidence in critically assessing what you read. The graded aspects for this portion of the course will include several short written communications, a “Job search” unit where you will undertake a mock interview, and a major technical written report with oral presentation. Since this is a course that focuses on technical communication skills, it is important that your English grammar and composition be reasonable. However, this is not an English course. Therefore, based on short writing assignments early in the course, it may be suggested that you make use of the resources available on campus to help you prepare your documents.

The problem solving portion of the course is aimed at the development of individual awareness and skill in problem solving. It is again, the first in a series of three courses that includes ChE 3G03 (development of group and interpersonal skills in the context of group activities to develop models of Chemical Engineering processes) and ChE 4N04 (application of these skills to real world professional problems including ethics, case studies and trouble shooting). Some aspects of the problem-solving portion of the course will be presented in conjunction with material from ChE 2D04 and therefore this course is a corequisite. This portion of the course will be evaluated using three different means – a skill mark, assigned by you, in agreement with the TA, based on evidence related to the learning objectives presented and class participation, and a written, closed-book, final examination.

Overall Context: Graduates from McMaster Chemical Engineering will be:

- Technically sophisticated, with an emphasis on the fundamentals.
- Computer literate, able to program in relevant languages and familiar with a range of software, word processors, spreadsheets and data analysis tools.
- Able to self-assess, critically analyze the work of others, give feedback, organize and plan.
- Enriched through senior technical electives drawn from the departmental research expertise.
- Skilled in lifelong learning, communication, problem solving, interpersonal skills and group work.
- Concerned with safety and the environment.
- Ethical.

Format: This course will be a combination lecture, group discussion and workshop. We work together on assignments and other tasks and learn how to improve our ability to solve problems in this context. Since a good part of the learning will occur in class, you will get little from the course if you do not attend and participate in all activities. Assignments are due in class (at exactly 19:00 – before the lecture starts) and if you do not attend and participate you will undoubtedly be required to repeat the course. We will monitor your progress and if your participation is not adequate, we will write to you in mid-October indicating that your lack of participation may result in course failure. If family emergencies should arise, you are sick or cannot attend a scheduled session, please contact Dr. Jones or Mr. Leung in advance to make alternate arrangements.

Objectives:

Technical Communication Course Objectives:

- Given a topic (and an audience), you will be able to use an organized, systematic and pertinent approach to searching the literature.
- Given a topic (and an audience), you will be able to locate at least four articles, books or publications that your instructor judges as being pertinent to the topic and to the purpose.
- Given a writing task, you will be able to prepare a properly formatted document with relevant equations, figures, and tables such that your instructor judges them to be “Boss-quality”.
- Given published information from books or articles, you will provide clear and appropriate referencing so that you give credit and identify the source. You will not reproduce information from an outside source without proper citation.
- Given a video of your oral presentation, you will be able to objectively self-assess your presentation and identify (for feedback) five consistent strengths and two consistent areas to work on.
- Given your written formal report, you will be able to objectively self-assess your report and identify (for feedback) five consistent strengths and two consistent areas to work on.
- The communications that you present will be your own work. Academic dishonesty will be reported to the University and will be penalized.

Problem Solving Course Objectives are given for each unit. However, in general you will develop skill and confidence in your:

- Ability to talk through your thought processes.
- Ability to reflect on your thought processes, your feelings and your attitudes.
- Ability to extend problem solving skills and use them in everyday life.
- Self-assessment ability with regards to your performance based on goals, measurable criteria and evidence. You will be skilled in participating in a personal performance review.
- Ability to give and receive feedback.
- Problem solving skills for solving your ordinary homework problems. In particular this will mean:
 - You will possess a variety of problem solving skills.
 - You will be active in writing out the elements of the problem solving process.
 - You will monitor and reflect on the process.
 - You will be organized and systematic.
 - You will be flexible, creative and able to view problems from many different points of view.
 - You will keep options open and will defer judgment as appropriate.
 - You will use pertinent subject knowledge effectively and critically.
 - You will welcome and manage change.
 - You will manage time and stress effectively.
 - You will spend time defining a problem.
 - Your decision making will use measurable criteria and will be based on evidence.

The Canadian Engineering Accreditation Board (CEAB) which accredits our program (meaning you can call yourselves “engineers” after graduation and registration with the PEO), has several attributes that engineering students must demonstrate before graduation. Four of these attributes are specifically measured in this course.

Table 1. Engineering attributes demonstrated in Chem Eng 2G03

Presents instructions and information clearly and concisely.	Assignment: Paper summary
Constructs effective written arguments.	Assignment: Term paper
Demonstrates an ability to respond to technical and non-technical instructions and questions.	Assignment: Boss Quality Assignment
Have experience with techniques for generation of creative ideas such as brainstorming and structured inventive thinking.	Assignment: Brainstorming workshop

Assessment: Marks will be deducted for the submission of late reports: -10% if not handed in at the beginning of class (19:00) and -20% per day late. In other words, an assignment due Monday, handed in on Wednesday would receive 40% off. Hand all late assignments directly to Dr. Jones's office (372) by slipping them under the door if she is not there. Do NOT hand in late assignments to the departmental office.

Technical Communication: The grade for this portion of the course will be comprised of the individual writing assignments, the oral presentation/interview and participation.

Problem Solving: At the end of each McMaster Problem Solving (MPS) unit, you will need to collect all of your evidence and assign yourself a skill mark for the unit that is based on your evidence and on the stated objectives for the specific unit in question. The TA will consider the evidence and will assign a skill mark for the unit in question and extra marks if your self-assessment matches the TA's assessment.

The overall mark distribution will be as follows for the course:

Technical communication (50%)	
Assignments (total 7%)	
• Assignment #1: Article summary	2%
• Assignment #2: Boss Quality Document – Chemical Structures	2%
• Assignment #3: Boss Quality Document – Graphs and Tables	3%
Job search (total 6%)	
• Cover letter and resume prepared and reviewed by ECCS or SSC	1%
• Interview	5%
Term paper (total 30%):	
• Outline and references	1%
• Paper on time for peer editing and review tutorial attendance	3%
• Peer review	3%
• Final term paper	15%
• Oral presentation	8%
Participation (total 7%)	
• Online quizzes	4% (if <u>all</u> completed)
• Literature search tutorial	1%
• Plagiarism statement	1%
• Proofreading activity	1%
Problem solving (50%)	
MPS Evidence tables (ET) (total 24%)	
• Awareness ET	4%
• Self-assessment ET	4%
• Analysis & classification ET	4%
• Time & stress management ET	4%
• Creativity ET	4%
• Problem solving strategy reflection	4%
Personal Enrichment Project (PEP) (total 10%)	
• Proposal	1%
• Weekly evidence (4 weeks)	4%
• Final report	5%
Final exam (closed book on problem solving)	16%

Course Schedule (tentative)

Assignments will be due at the beginning of each class (19:00). When reports are to be submitted electronically, the deadline is 11:59 pm, the day of the class.

***There is an online quiz on Avenue to Learn before EVERY class (except class 1).** Please read the assigned portions of the courseware (in table below) and complete the quiz before coming to class. You must complete and pass all of the online quizzes to earn the 4% participation marks and to make the workshops, activities and discussions in class meaningful.

Class (Date)	Topics	Reading for Pre-class Avenue Quiz* (Courseware 2015)	Assignments Due	Tutorial
1 (Sept. 14)	Introduction	iii-x (Outline) 1-3 (1.1)	• None	None
2 (Sept. 21)	What is Chem. Eng.? Pyramid Writing Technique Research Articles	4-12 (1.2-1.4) 61-70 (5.1-5.5) On Avenue: ChEEEd_2014.pdf	• None	None
3 (Sept. 28)	MPS ^s Awareness	91-92 (Awareness intro) 109-110 (ETs) On Avenue: JEEEd_MPS_1997 .pdf (skim article)	• Assignment #1: Article Summary • Choose Paper Topic	None
4 (Oct. 5)	Technical Writing Searching the Literature Referencing Boss-Quality Documents	21-24 (1.9-1.10) 44-53 (all of 3)	• Signed Plagiarism Statement (in class) • MPS Awareness ET	Searching the Literature & Mendeley (Mandatory)
NO CLASS MID-TERM BREAK (Oct. 12)				
5 (Oct. 19)	MPS Analysis & Classification	14-15 (1.5) 71-72 (5.5) 147-148 (A&C intro)	• Term Paper Outline/References	Boss-Quality Documents: Extra Help Tutorial (Optional)
6 (Oct. 26)	MPS Strategy MPS Self-Assessment	28-29 (2.3), 34-43 (2.4-2.5 & Assignments 2 and 3) 54-60 (all of 4), 111-114 (Strategies intro) 131-132 (Self Assessment intro), 143-145 (PEP)	• MPS Analysis & Classification ET • PEP proposal due • Assignment #2: Boss Quality Document – Chemical Structures	Boss-Quality Documents: Extra Help Tutorial (Optional)
7 (Nov. 2)	Invited Speaker Formal Reports Formatting & Figures	16 (1.6) 18-20 (1.8) 30-33 (2.2-2.3)	• Assignment #3: Boss Quality Document – Graphs & Tables • MPS Self-Assessment ET • Start PEP	None
8 (Nov. 9)	MPS Time & Stress Management	155-157 (Time & Stress intro)	• Term Paper (due to	1-on-1 Term Paper

	Oral Presentation Skills	72-75 (5.6)	Turnitin.com) • PEP Evidence	Review (Mandatory)
9 (Nov. 16)	Invited Speaker Job Search Interview Skills	76-87 (6.1-6.2) (+Term paper you are reviewing!)	• Term Paper Peer Evaluation (on Turnitin.com) • MPS Time & Stress Management ET • PEP Evidence	Oral Presentations: Wed & Thurs night (Mandatory)
10 (Nov. 23)	MPS Unique You	175-176 (Unique You intro)	• Revised Term Paper (hard copy in class and electronic copy to Turnitin.com) • PEP Evidence	None
11 (Nov. 30)	Invited Speaker Audience Analysis How to Write an Email	17 (1.7) On Avenue: Job Posting.pdf (for mock interview)	• Problem Solving Strategy Reflection • PEP Evidence • Oral pres. Self- assessment	Mock Job Interviews (Mandatory)
12 (Dec. 7)	MPS Creativity	187-188 (Creativity intro)	• MPS Creativity ET (in class) • PEP report	

[§]MPS = McMaster Problem Solving Unit, ET = reflection and evidence table, PEP = Personal Enrichment Project

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.

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.

It is your responsibility to understand what constitutes academic dishonesty. For information on the various types of academic dishonesty please refer to the Academic Integrity Policy, located at <http://mcmaster.ca/academicintegrity/>.

The following illustrates only three forms of academic dishonesty:

1. Plagiarism, e.g. the submission of work that is not one's own or for which other credit has been obtained.
2. Improper collaboration in group work.
3. Copying or using unauthorized aids in tests and examinations.

In this course we will be using Avenue to Learn. Students should be aware that, when they access the electronic components of this course, 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 this course will be deemed consent to this disclosure. If you have any questions or concerns about such disclosure please discuss this with the course instructor.

In this course we also will be using the web-based service Turnitin.com to reveal plagiarism. Students will be expected to submit their work electronically to Turnitin.com and in hard copy so that it can be checked for academic dishonesty. Students who do not wish to submit their work to Turnitin.com must hire a professional and have it certified that it has been checked for plagiarism, before the due date. All submitted work is subject to normal verification that standards of academic integrity have been upheld (e.g., on-line searches, etc.).

Create an account at Turnitin.com and follow the instructions to “enroll” in this course: Class ID: 10180795; Password: biomaterials.

Student Accessibility Services: Students with disabilities can receive accommodations to assist them in the completion of their assignments and exams. Furthermore, there are resources and workshops available to students which deal with academic skills, university life and culture. Please contact Student Accessibility Services for further information at: <http://sas.mcmaster.ca/>.

The instructors and the 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 Avenue to Learn weekly during the term and to note any changes.