

# ChE 3L03 Intermediate Laboratory Skills

## Course Outline – Winter 2024

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January 9, 2024\*

## 1 General Information

### 1.1 Course Objectives

To provide basic skills and experience in chemical engineering laboratory, technical writing, and statistical data analysis. Laboratory topics are chosen to reinforce prior or current courses such as fluid mechanics, heat and mass transfer, thermodynamics, and reactor design.

### 1.2 Overview of Lab Organization

- Each experiment lasts for a 3-day lab cycle and is normally finished by a group of 3-4 students.
- Within each cycle, students are asked to conduct data collection and processing following lab manual instructions during the first two lab days. The third lab day will be an open lab day when the students are asked to propose and follow their own experimental plans (see section 2.5).
- Upon completion, every student shifts to a new experiment with different group-mates for the next cycle.
- There are a total of 3 lab cycles in the course: i.e., every student will finish 3 of the experiments offered.
- Experiment/group assignment is determined by the instructor and will be posted on the course A2L site at the start of the term.

Experiments	
No.	Name
1	Ammonia Desorption
2	Calorimetry
3	Climbing Film
4	Distillation Column
5	Fluid Circuit
6	Mixing Column*
7	Polymer Rheology

\*Not offered this term.

### 1.3 Teaching Staff

Role	Name	E-mail/Contact	Responsibilities
Instructor	Li Xi	<a href="mailto:xili@mcmaster.ca">xili@mcmaster.ca</a> *	Lectures; General Course Management
Lab Manager	Tim Stephens	<a href="mailto:stepht2@mcmaster.ca">stepht2@mcmaster.ca</a> ; JHE-A106B	General Lab Supervision
TAs	Lubhan Cherwoo	<a href="mailto:cherwool@mcmaster.ca">cherwool@mcmaster.ca</a>	Expts 1, 4, 7
	Hossein Ipakchi	<a href="mailto:hossein.ipakchi@mcmaster.ca">hossein.ipakchi@mcmaster.ca</a>	
	Kayla Baker	<a href="mailto:bakerk9@mcmaster.ca">bakerk9@mcmaster.ca</a>	Expts 2, 3, 5
	Alisa Douglas	<a href="mailto:dougl5@mcmaster.ca">dougl5@mcmaster.ca</a>	
	Eric Liu	<a href="mailto:lium18@mcmaster.ca">lium18@mcmaster.ca</a>	
	Naveen Vasudevan	<a href="mailto:vasudevnm@mcmaster.ca">vasudevnm@mcmaster.ca</a>	

\*Check availability for appointments: <https://xiresearch.org/lx-calendar/>

\*Future revisions of this document posted on the course A2L page will always supersede earlier versions.

## 1.4 Textbook

### – Required –

Chem Eng 3L03 *Electronic* Coursepack on McMaster eReserves, 2024

- Available at: A2L → Content → Course Readings → eReserves.

## 1.5 Class Scheduling

Session	Content*	Time	MS Teams Code	Room
C01	Lecture	Tue 11:30–12:20	9r843ek	T13 125
L01	Lab/Mon	Mon 13:30–16:30	5z2atmi	JHE A106
L02	Lab/Tue	Tue 13:30–16:30	80i1sc3	
L03	Lab/Wed	Wed 13:30–16:30	ap6ji1t	
L04 <sup>†</sup>	Lab/Thu	Thu 13:30–16:30		
L05	Lab/Fri	Fri 13:30–16:30	jyyw3wd	

\*Students are asked to finalize their lab session choice by noon, the Thursday before the first lab day.

<sup>†</sup>Cancelled due to low enrollment.

## 1.6 Communication

**Avenue to Learn** (<http://avenue.mcmaster.ca/>; also referred to as “Avenue” or “A2L”) will host the main course webpages, where course materials, documents, assignments, online discussion, important announcements, and other related information will be posted/hosted. The students are expected to check the course A2L page regularly.

**Microsoft Teams** (<https://teams.microsoft.com/>; also referred to as “MS Teams” or just “Teams”) will be the platform for group work, collaboration, and discussion, as well as the default venue for online meetings. Students must make sure that they join *both* the general course team (C01) *and* the appropriate team for their lab session, using the codes listed above.

**McMaster E-mail Account** The “@mcmaster.ca” E-mail accounts will also be used for course-related correspondence. The students are expected to check their E-mail accounts regularly. (Note: *A2L* has its separate *internal E-mail system*, which *will NOT be used or checked*.)

## 2 Assessment Procedures

### 2.1 Grading Scheme

Item	Weight	Due	
		when	where
In-Class Assignments	10%	during the lectures	in class
Pre-Lab Preparation	5%	during the lab sessions	in person to the supervising TA
Lab Progress Logs	—*	48 hours after the lab session ends for the 1st and 2nd lab day of each cycle (submission within 24 hours is <i>encouraged</i> but not enforced).	Group Channel at MS Teams <sup>†</sup>

Open Lab Day Plan	— <sup>‡</sup>	after lab day 2 and together with the 2nd progress log.	Group Channel at MS Teams
Lab Report 1 (Group)	20%	23:59 pm, one week from the last lab day in the cycle	A2L
Lab Report 2 (Group)	30%		
Lab Report 3 (Indiv.)	35%		

\*Weights of the progress logs are included in the lab reports according to the report grading rubric.

<sup>†</sup>To facilitate group collaboration and communication, each group is asked to prepare and maintain their progress log in their group MS Teams channel. Once completed, they are asked to notify the supervising TA (by tagging) in the channel and provide a link to the file.

<sup>‡</sup>Weights of the plans are included in the lab reports according to the report grading rubric.

- **All three lab reports must be submitted to pass the course.**
- Adjustment/re-curving of the term grade may be applied at the discretion of the instructor.
- The final letter grade will be assigned using the Registrar's recommended procedure.

## 2.2 In-Class Assignments

- **Attendance** to the weekly lecture is **mandatory**.
- Assignments, in the form of short quizzes or other tasks, may be given in any lecture with no prior notice.
- In-class assignments are graded for completeness only. The student will receive full marks as long as there is *a reasonable attempt at each question*.
- With a valid MSAF, the student is allowed to make up the in-class assignment at a later date.
- It is the responsibility of the student to contact the instructor for making up assignments. Each student is allowed to miss and make up no more than two in-class assignments during the whole term.
- Make-up assignments must be completed by the end of the last business day before the assessment ban.

## 2.3 Pre-Lab Preparation

Students are required to

- Read the lab manuals of the assigned experiments before the start of each lab cycle; and
- Watch the background/theory/demonstration video clips assigned to each lab day before attending each lab session.

A pre-lab preparation mark will be assessed for each lab cycle. Evidences of preparedness include:

- Ability of the student to answer basic questions about lab activities;
- Evidence that the student has read the relevant sections of the lab manual;
- Preparation of a spreadsheet, table, or notebook to record data;
- Preparing questions about the lab measurements, theories, or calculations in advance of the lab.

Insufficient preparation is also punishable as a lack-of-participation infraction (section 3.2). Lack of familiarity with the equipment can also result in safety infractions (section 3.1).

## 2.4 Progress Logs

- Each group are required to keep a log of their lab progress, which is submitted to the appropriate TA for review after the 1st and 2nd lab days of each cycle (see section 2.1 for submission details).
- The file is accumulative: i.e. the version submitted after the 2nd lab day must include contents from both first two lab days.
- The file **must be brief**, with *no lengthy description or discussion* (which belongs to the full lab reports).
- The purpose of the file is threefold.
  - Require the students to (1) summarize important observations and reflect on the challenges and questions encountered and (2) turn raw data into a processed form (by performing the required calculations and data reduction) and visualize the data (by figures and/or tables) for efficient presentation, from which a full report can later be composed.
  - Oblige the students to complete these data processing/analysis tasks in a timely manner, during the lab or immediately afterwards (while the whole group are together), for better organization and efficiency.
  - Allow the TAs and the instructor to monitor the progress of the group and provide timely feedback between lab days.
- Contents required
  - A header listing the experiment title, authors (including full names, MacIDs, and student numbers), lab session (e.g., MondayPM), 1st or 2nd log file, and submission date.
  - A main body that starts with a few bullet-point summary of the progress so far, and any issues or questions encountered.
  - It is followed by all the processed data (plots and tables) to date, each with a one-liner description of the main observation (e.g., “the vapor pressure of ethanol increases with temperature”), which in no case should exceed two sentences.
  - [For the 2nd log only] A bullet-point overview of the plan for the last lab day.
  - **All text**, excluding figures and tables, in the main body must **not exceed one page**.
  - All raw data measured to date must be included in the appendix, which is not counted in the page limit.
- Grades of the progress logs are counted towards those of the full reports.
- **IMPORTANT:** since the progress log is always finished by the group, someone must be available to finish and submit, **late or missed submission will not be acceptable under any circumstance** – including accidents, emergencies, or medical conditions. **MSAFs will not be accepted.**

## 2.5 Open Lab Day Plan

The third lab day of each cycle is an Open Lab Day in which students are given the opportunity to determine their own lab activities.

Some examples of such activities include:

- Complete any lab measurements not completed in Weeks 1 and 2;
- Carry out further measurements to establish trends more clearly;

- Carry out Self-Directed Learning (SDL), in which you test one or more variables not examined in Weeks 1 or 2.

The group is asked to discuss with their supervising TA about their plan during lab day 2. The activities must cover 1.5 to 3.0 hours of lab time.

The outline of the plan should contain the following contents:

- A specific description of what lab testing you intend to carry out;
- A brief summary of the methods you will use to carry out the lab-work;
- The specific rationale behind the lab work, such as what trend are you trying to clarify or what new insight are you trying to obtain.

The total length **should not exceed one page** and it must be submitted as an appendix to Progress Log 2.

## 2.6 Lab Reports

### Overview

- Three lab reports are required, one for each lab cycle.
- In the first two cycles, each group submit one report.
- In the last cycle, the group still perform the experiment together, as well as submitting the progress logs and the open lab day plan as a group, but each member must prepare their own final report individually.

### 2.6.1 Report Preparation

#### Content Requirements

- TITLE PAGE experiment title, submission date, group members (including the full name, MacID, and student number of each member).
- TABLE OF CONTENT
- RESULTS AND DISCUSSION
- CONCLUSIONS
- LIST OF SYMBOLS Required if more than 5 standalone equations are displayed in the main body.
- REFERENCES A minimum of 4 archival publications (books or academic journal papers) must be cited. Webpages are not allowed. The Coursepack may be cited but is not counted toward the required number of references. The IEEE citation style is required.
- APPENDICES A complete set of sample calculation must be provided as **Appendix A**. **All raw data** measured in the experiment **must be provided** as tables in **Appendix B**. The contents and organization of other appendices are at the discretion of the report author(s).

#### Formatting Requirements

- Times New Roman 11-pt font; 1.5 line spacing.
- Letter size with 1 in margins on all sides.
- 8-page limit for the main body, including figures and tables while excluding the title page, table of contents, list of symbols (if used), references, or appendices.

## Useful Resources

**Grading Rubric (A2L)** The reports are graded strictly following the rubric, which is the sole criterion for evaluation and overrules any other references. Reading the expectations outlined in the rubric is the most direct guideline for writing your report.

**Report Writing Guidelines for ChE 3I03, 3L02, and 4L02 (A2L/eReserves)** This document serves as a general guidance for report writing. A checklist is included for you to check common areas. The document provides a good starting point for report writing, but following its suggestions is not enough to guarantee good grades.

### **2.6.2 Report Submission**

- Lab reports must be submitted to the appropriate folder on A2L. *Reports submitted elsewhere, such as MS Teams or the E-mail accounts of the instructor or the TAs, will be ignored.*
- **Only PDF files are accepted.**
- The Pledge of Originality, as described in section 2.6.3, must be appended to the end of *the same PDF file* as the report and after its appendices.
- The **file name** of the report must **strictly follow the format of:**  
Report [Cycle No.] - [Lab Day] - [ExperimentNameInOneWord] - [Submitter's Surname]  
For example, Report1-Tuesday-MixingColumn-Smith.pdf.  
For experiment names, refer to the table in section 1.2.
- **Reports submitted in wrong file formats or with incorrect file names are subject to a 5% penalty.**
- The reports are due one week after your last lab day of the cycle. For example, for students enrolled in the Tuesday session, the reports are due on the Tuesday *after* the third lab day of the cycle, by 23:59.
- The **lateness penalty includes a 20% base penalty, plus an additional 1% penalty for every hour late** (rounded to the next whole hour; weekends and holidays included).

### **2.6.3 Originality and Academic Integrity**

#### Plagiarism

- Students are urged to review the definition of plagiarism and methods for its prevention at the McMaster Office of Academic Integrity website.  
<http://www.mcmaster.ca/academicintegrity/students/typeofad/plagiarism/>
- [TurnItIn.com](http://TurnItIn.com) and/or other originality examination tools will be used to produce an originality report of each submitted report.
- Plagiarism cases will NOT be determined solely based on the originality score. It is possible to have a high overlap percentage in a legitimately written report and vice versa.
- The nature of overlapping text is more important.
  - Overlap of a single isolated *simple* sentence with another source is not necessarily considered plagiarism.
  - An identical complex sentence is usually considered plagiarism.
  - Complete overlap of two sentences (simple or complex) in the whole report may be considered plagiarism.
  - Two or more consecutive sentences that are mostly (but not necessarily completely) overlapping with other sources are almost certainly considered plagiarism.

- Note: direct quotes, e.g., between quotation marks, are extremely rare in science and engineering literature, which are only acceptable in exceptional cases (even when citation is given).

**Generative AI** Students are **NOT permitted to use generative AI in this course**. In alignment with [McMaster academic integrity policy](#), it “shall be an offence knowingly to . . . submit academic work for assessment that was purchased or acquired from another source”. This includes work created by generative AI tools. Also state in the policy is the following, “Contract Cheating is the act of ‘outsourcing of student work to third parties’ (Lancaster & Clarke, 2016, p. 639) with or without payment.” Using Generative AI tools is a form of contract cheating. Charges of academic dishonesty will be brought forward to the Office of Academic Integrity.

For more information on the definition of and McMaster’s policy towards generative AI, refer to <https://provost.mcmaster.ca/office-of-the-provost-2/generative-artificial-intelligence/>.

### **Pledge of Originality**

- A written Pledge of Originality must accompany every full report submission.
- The pledge should use the provided template (A2L), signed by all author(s), and appended to the full report (in the same PDF file after the last appendix).
- Submission without the Pledge will not be graded and **late submission of the Pledge is subject to a 5% penalty**.

### ***2.6.4 Collaboration and Group Contributions***

Students in a group are expected to collaborate in a professional and collegial manner throughout the lab cycle.

- For the first two lab cycles, it is expected that each member should contribute (roughly) equally to all group work including the planning/preparation, data collection, data processing, progress logs, open lab day plan, and full report.
  - By default, all group members will receive the same grade for the group report.
  - Significant departure from the equal contribution expectation will result in grade adjustment.
- For the third lab cycle, the members are still expected to make equal contribution to all activities with the only exception of the final full report.
  - Although reports of cycle 3 will be graded individually, grade adjustment can still be applied for significant departure from equal contribution to the group activities.

### **Peer Assessment Form**

- A Peer Assessment Form must be submitted following each full report submission by each student (using template posted on A2L).
- The Form is submitted to a separate folder on A2L, ensuring that its contents are confidential to other students, and it will be due within 72 hours of the report deadline.
- Students are asked to evaluate every member’s contribution to the group work in the Form. The information will be used to determine whether grade adjustment is needed.
- If a student does not submit the form by the deadline, they relinquish their right to claim contribution to the group work. Their contribution will be determined from forms submitted by other group members.



**Relationship between Group and Individual Work in Cycle 3** In cycle 3, progress logs and open lab day plan are completed in groups whereas the final full report is completed individually. The following policies govern the use of group work in individual reports.

- Original and processed data are shared between the group members. Every member is entitled to use those data for their individual report.
- All other contents of the report must be individually completed by its author, including (but not limited to) all text (including captions), equations, figures, and formatted tables, in both the main body and appendices of the report.
- Each student is allowed to reuse part of the contents previously submitted in the progress logs (or open lab day plan) of the same group/cycle, provided that they can demonstrate that they are the original author of that particular part in the group work.
- *When more than one students in the same group reuse the same piece of work (sentences, figures, etc.) from, e.g., the progress logs, that creates an academic integrity infraction.*
- To avoid disputes, it is critical for group members to mark contributions in the group work and clarify any ambiguity before submitting their full reports.

### **2.6.5 Missed Reports**

#### **Policy: Permission for Make-up**

- Students have a full week to complete the report after the last lab day. It is therefore their responsibility to plan their time ahead for any emergency.
- Students need the permission from the instructor to make up for any missed report, which is **only** given in the case of extreme illness or injury that results in hospitalization. **Both**
  - a doctor's note indicating hospitalization, **and**
  - an MSAFmust be submitted to the instructor for it to be considered.
- In no cases will the student be permitted to miss and make up for **both group reports** since group work is an indispensable training goal of the course.

#### **Make-up Reports**

- Missed group reports
  - 5-page maximum, no figures or tables (figures and tables from the group report are to be included in an appendix – no need to reproduce).
  - Must be originally written by the student individually with no similarity with the group report.
  - A minimum of 2 references (not counting the Coursepack) meeting the course requirement.
- Missed individual reports
  - A full report in accordance with the normal report requirement must be submitted.
- The due date is the earlier of
  - one week from receiving the permission for writing the make-up report from the instructor



– the day before the assessment ban

and the due time is 23:59.

- For missed reports beyond this time frame, the student will be required to return after the term ends and collect new data, according to the procedure below for missed lab cycles (section 3.2).

### **2.6.6 Disputes and Resolution**

**Challenging the Grade** Reports can only be regraded in its entirety: i.e., it is not possible to change the mark of one attribute in the rubric without reviewing all the others. Therefore it is possible for the grade to get lower after the grade-challenge process. Because of the amount of time required, reports can only be regraded if there is sufficient evidence that the error or unfairness of the original grading has a substantial effect on the grade. To meet this requirement, you will need to follow the procedure below.

1. Review the whole rubric and identify all attributes where the mark is challenged.
2. For each of these attributes, identify which mark you think your report deserves and provide your justifications (based on the rubric).
3. Add the mark changes from all these disputed attributes and only submit your request if the total potential change is more than 5 marks.
4. If it is a group report, obtain the consent from all group members.
5. Submit your request in writing (including all justifications) to the instructor by E-mail within 10 calendar days after the report was first returned to the submitter.

**Disputes in Group Work** Collaboration is an important skill to be developed in this course. Students are strongly advised to commit to their obligation to the group, behave professionally in the collaboration, and effectively communicate with one another to allocate the work load and resolve any disputes. In case of any irreconcilable dispute, **the report must still be submitted on time and the disputes are only resolved after the submission.**

**Unequal Contribution** If one or more members have not contributed equally to the experiment and report, the grades will be adjusted according to the relative contributions of the members. Contributions are evaluated based on the peer assessment forms from the group members (see section 2.6.4). In case of significant discrepancy between information provided by members of a group, the instructor will investigate contributions by the members based on evidences such as raw and processed data, communication record, and any draft writings. It is thus important for all members to keep record of their contributions and also avoid the access to key files by the alleged non-contributor(s). Group members and the supervising TA may also be interviewed during the investigation.

**Unprofessional Conduct** In addition to the lack of contribution, other unprofessional behaviors from certain group members may impede or even sabotage the progress of the group. Examples include but are not limited to

- holding on to important data, analysis, or text contributions and refusing to share with group-mates or not responding to such requests;
- not providing “agreed upon” work and failing to notify the other members until it is too late to make up for.

Important notes:

- There is no excuse, under any circumstance (illness, injury, or family emergency), for not responding to or communicating with group-mates.
- Even the student is permitted by the instructor to miss any work with legitimate documentation, they are still obliged to notify and coordinate with other group members to ensure the smooth transferring of data, information, and responsibilities.

The burden of proof lies with the other members of the group. After reviewing the evidences submitted, the instructor may impose extra penalties for unprofessional conduct in addition to that for the lack of contribution.

### 3 Lab-Day Policies

#### 3.1 Safety

**Safety Rules in the Lab** A safety lecture will be given before students are allowed to enter the lab, where a complete overview of the lab safety policies will be introduced. Below is only a brief summary of the key rules.

- Eye protections, safety glasses or goggles, must be worn in the lab **at all times**.
- Use of cellphones and computers is limited to lab-related activities. Distraction by electronics usage or other causes is a safety risk.
- Avoid chemical contamination: do not touch personal items with gloved hands.
- No eating or drinking in the lab; no running or unruly behaviors.
- The experiment must be attended by at least one group member at any time.
- Attire in the lab
  - long sleeves at least; lab coats are strongly recommended
  - closed-toed shoes; no high heels
  - no shorts
  - no ties, dangling jewelry or accessories
  - long hair must be tied back

**Safety Violations** All infractions are documented. A typical sequence of repercussions is listed below.

**First Infraction** oral warning

**Second Infraction** written warning

**Third Infraction** expulsion from the experiment; 0 mark for the lab report

**Fourth Infraction** expulsion from the course with automatic failure

Note: depending on the severity of the infraction, the instructor reserves the right to escalate the punishment to higher levels.

#### 3.2 Attendance and Participation

- Full attendance (3 days in each lab cycle, 3 hours each day) is mandatory. MSAF is required for any missed lab time.
- **Missing one lab day without a valid MSAF will result in a 20% penalty in the lab report.**
- Lateness for more than 15 minutes or lack of participation during the lab session (including excessive cellphone usage or other distractions) will result in a **5% penalty in the lab report for each infraction.**

- For **each experiment** (3-day lab cycle), a student is **not allowed to miss more than 1 lab day or more than 3 lab hours accumulatively**, with or without MSAF(s); otherwise that lab cycle is considered missed for the student.
- For the **entire term**, a student is **not allowed to miss more than 2 lab days or more than 6 lab hours accumulatively**, with or without MSAF(s). Any absence beyond the above limit will result in the corresponding lab cycle(s) considered missed for the student.
- If a student misses more than 2 lab days or 6 lab hours in total during the term AND for at least one absence proper documentation (MSAF) is not filed, **automatic failure will be given for the course**.

**Missed Lab Cycles** For any lab cycle considered missed per policies above,

- the student is not allowed to submit a report (individually or as part of a group);
- they must schedule extra lab session(s) with the lab manager to complete a minimum of 6 hours of data collection;
- a lab report is due one week after the last make-up lab session, at 23:59.

### 3.3 Finishing and Timing

**Checkout Procedure** Before leaving the lab, students must properly restore and clean up the equipment used and its surrounding lab space, which must be inspected by the supervising TA or the lab manager. Leaving the lab without their permission or without proper cleaning/restoration will result in a **10% penalty in the lab report for each infraction**.

**Time Planing** Students are not allowed in the lab beyond the 3-hour limit of the lab day. Failure to exit the lab by the designated end time will result in a **5% penalty in the lab report for each infraction**. Additional penalty is applicable if the lab space is not properly cleaned/restored for the lack of time (see checkout procedure above).

### 3.4 University Closure (Snow Days)

When university closure is declared (for snow day or other reasons), the affected lab day will be advanced to the following week. All subsequent labs for that weekday will be advanced by one week. Assessment and report due dates will be adjusted accordingly (if they depend on the affected lab day).

Regardless of the above, all experiments must finish at least one week before the assessment ban. In the event that the advanced lab days exceed this limit, the instructor and lab manager will arrange different times for the students to complete their lab activities.

## 4 Accreditation Information

### Learning Outcomes of the Course

1. Understand common chemical engineering unit operations, including their equipment setup, process design, and underlying chemical engineering fundamentals such as transport phenomena, thermodynamics, and reaction engineering.
2. Understand the rationale behind the design of experimental setup and measurement procedures. Acknowledge the limitation and error sources in each design.
3. Acquire hands-on experience of operating chemical process equipment, such as columns, tanks, reactors, and separators.
4. Acquire hands-on experience of using measurement devices and sensors. Understand the sources of error and uncertainty in measurement.

5. Develop the skills of planning and managing complex multi-day and multi-task projects.
6. Develop the capability of implementing project requirements and delivering outcomes based on written (manuals, guidelines, rubrics, etc.) and oral instructions.
7. Develop the skills of working in a team, including effective team management, collaboration, and communication.
8. Develop the skills of data processing, synthesis, and presentation, including proper data reduction and organization, statistical analysis, and data visualization.
9. Develop the capability of critically interpreting experiment data for scientifically valid conclusions.
10. Understand the role of experimental error and uncertainty in data interpretation.
11. Develop technical writing skills, including the use of clear, concise, and accurate scientific language, logical organization of contents, and the presentation of compelling arguments. Understand the standards of technical documents.
12. Develop critical thinking skills, including reflecting on the experimental design, understanding the sources of error, and deriving meaningful physical insight from observations.

**CEAB Indicators Associated with the Course** The following information is required by the Canadian Engineering Accreditation Board (CEAB). Graduating from an accredited institution has many advantages. Detailed information is found at <http://www.engineerscanada.ca/accreditation>.

No.	CEAB Indicator	Learning Outcomes
3.2	Synthesizes the results of an investigation to reach valid conclusions.	L.O. 8, 9, 10, and 12.
4.4	Justifies and reflects on design decisions, giving consideration to limitations, assumptions, constraints and other relevant factors.	L.O. 1, 2, 4, and 12.
7.1	Demonstrates comprehension of technical and non-technical instructions and questions.	L.O. 6.
7.2	Composes an effective written document for the intended audience.	L.O. 11.
11.2	Plans and effectively manages a project's time, resources, and scope, following business practices as appropriate.	L.O. 5.

## 5 The P.R.O.C.E.S.S.

As some of you may already be aware, the Department of Chemical Engineering has a storied history of education. In addition to teaching and learning, the department is proud of our graduates not only for their academic success, but their more intrinsic traits that make them respected members of the engineering community.

Recently, several high-ranking graduates from the McMaster Chemical Engineering Program employed in various industries (oil/gas, financials, etc.) were interviewed to ask what traits they look for when hiring for engineering positions. Using this information, the department would like to present to you the **PROCESS**: a code of conduct that we hope will guide our students throughout this program and their careers to come.

- Professionalism
- Responsibility
- Ownership
- Curiosity
- Empathy
- Selflessness
- Service

It is up to YOU to interpret these traits and apply them to your time at McMaster and your career as you see fit. These traits will not be assessed for grades but will be strongly encouraged throughout your time at McMaster. We hope that you identify with these character traits and what they mean to you, and that you **trust the process**.

## 6 Approved Advisory Statements

The following statements are required per McMaster's Undergraduate Course Management 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](https://secretariat.mcmaster.ca/university-policies-proceduresguidelines/), located at <https://secretariat.mcmaster.ca/university-policies-proceduresguidelines/>.

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.

**Authenticity/Plagiarism Detection** Some courses may use a web-based service ([Turnitin.com](https://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](https://turnitin.com) or via an online learning platform (e.g. A2L, etc.) using plagiarism detection (a service supported by [Turnitin.com](https://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](https://turnitin.com) please go to [www.mcmaster.ca/academicintegrity](http://www.mcmaster.ca/academicintegrity).

**Courses with an On-Line Element** Some courses may use on-line elements (e.g. e-mail, Avenue to Learn (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.

**Online Proctoring** Some courses may use online proctoring software for tests and exams. This software may require students to turn on their video camera, present identification, monitor and record their computer activities, and/or lock/restrict their browser or other applications/software during tests or exams. This software may be required to be installed before the test/exam begins.

**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 on-line platforms (e.g. use of Avenue 2 Learn, WebEx 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](mailto: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** In the event of an absence for medical or other reasons, students should review and follow the [Policy on Requests for Relief for Missed Academic Term Work](#).

**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 Faculty Office **normally within 10 working days** of the beginning of term in which they anticipate a need for accommodation or to the Registrar’s Office prior to their examinations. 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

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every original literary, dramatic, musical and artistic work, **including lectures** by University instructors.

The recording of lectures, tutorials, or other methods of instruction may occur during a course. Recording may be done by either the instructor for the purpose of authorized distribution, or by a student for the purpose of personal study. 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 University reserves the right to change the dates and deadlines for any or all courses in extreme circumstances (e.g., severe weather, labour disruptions, etc.). Changes will be communicated through regular McMaster communication channels, such as McMaster Daily News, A2L and/or McMaster email.

## A Course Agenda: Important Dates and Deadlines at a Glance

Week	Day & Time	Content
1 (Jan 8–Jan 12)	Tue Thu noon	Lecture 1* (no labs this week) <b>Finalize Lab Session Choice.</b>
2 (Jan 15–Jan 19)	Tue your lab day 48 hrs after lab session ends	Lecture 2 1st experiment/lab day 1 <sup>†</sup> <b>Progress Log due to MS Teams</b>
3 (Jan 22–Jan 26)	Tue your lab day 48 hrs after lab session ends	Lecture 3 1st experiment/lab day 2 <b>Progress Log + Open Lab Day Plan due to MS Teams</b>
4 (Jan 29–Feb 2)	Tue your lab day	Lecture 4 1st experiment/lab day 3
5 (Feb 5–Feb 9)	Tue your lab day 23:59, your lab day 48 hrs after lab session ends 72 hrs after report due	Lecture 5 2nd experiment/lab day 1 <b>Report 1 due to A2L</b> <b>Progress Log due to MS Teams</b> Peer Assessment Form due to A2L
6 (Feb 12–Feb 16)	Tue your lab day 48 hrs after lab session ends	Lecture 6 2nd experiment/lab day 2 <b>Progress Log + Open Lab Day Plan due to MS Teams</b>
7 (Feb 19–Feb 23)	Midterm Recess	
8 (Feb 26–Mar 1)	Tue your lab day	Lecture 7 2nd experiment/lab day 3
9 (Mar 4–Mar 8)	Tue your lab day 23:59, your lab day 48 hrs after lab session ends 72 hrs after report due	Lecture 8 3rd experiment/lab day 1 <b>Report 2 due to A2L</b> <b>Progress Log due to MS Teams</b> Peer Assessment Form due to A2L
10 (Mar 11–Mar 15)	Tue your lab day 48 hrs after lab session ends	Lecture 9 3rd experiment/lab day 2 <b>Progress Log + Open Lab Day Plan due to MS Teams</b>
11 (Mar 18–Mar 22)	Tue your lab day	Lecture 10 3rd experiment/lab day 3
12 (Mar 25–Mar 29)	23:59, your lab day 72 hrs after report due	<b>Report 3 due to A2L</b> Peer Assessment Form due to A2L
16:00, Apr 3 (Wed)		Deadline for making up missed in-class assignments
23:59, one week after the permission is given by the instructor or Apr 3 (Wed), whichever is earlier		Deadline for submitting make-up lab reports

\*In-class assignments may be given in any of the listed lectures with no prior notice, which will be due in person at the end of the class.

<sup>†</sup>Students may be examined and graded for their Pre-Lab Preparation during any lab day.