Chemical Engineering 4N04

Engineering Economics and Problem Solving

Course Outline - Fall 2023

Course Details

Instructor:		**Dr. Jake Nease**	**neasej@mcmaster.ca** **(905) 599-3165**	**BSB/B105**
Teaching Assistants:		Hoda Oyarhoseini Samuel Ogunniyi Farshad Moayedi Nick Rountes	oyarhosh@mcmaster.ca ogunniys@mcmaster.ca moayedif@mcmaster.ca rountesn@mcmaster.ca	MS Teams MS Teams MS Teams MS Teams
Website:		Avenue2Learn	avenue.mcmaster.ca	
Lectures*:		See A2L	See A2L	See A2L
Tutorials*:		See A2L	See A2L	See A2L
Office Hours:	**INST:** **TA:**	Mondays TBD	10:30 – 12:20; in tutorials	
Prerequisites:	Chemical Engineering 2O04, 3P04, 3K04, 3G04, 3M04			
Software:	This course will require the application of Aspen Plus and MS Office			
Course Materials:	Lecture slides and workshops, assignments, videos, and solutions will be posted on A2L Grades will also be posted on A2L but are not official until released on MOSAIC			
Recommended Textbooks:	Dr. Thomas Marlin has a wonderful online book and video series related to this course PC Education Homepage Operability Process Control			

*Based on McMaster's safety and inclusion policy, scheduling information is available separately only on A2L.

Formal Course Description

This course touches on making decisions about the design and operation of engineering systems emphasizing safety, economics, equipment performance, uncertainty, flexibility and monitoring. Includes the coalescence of the terms above for troubleshooting. Students will work individually and in groups on problem-based projects.

Informal Course Description

This is where your plant design knowledge converges with the dynamics and controls. A practical, forest-from-the-trees look at what it takes to design and operate a functional chemical plant.

Learning Objectives

Given a strong foundation in the fundamentals of Chemistry, Physics, Mathematics, and Engineering Science, it is the objective of this course to help you learn to apply these skills (together with safety, ethical, environmental, sustainability, and financial criteria) to solve practical and industrially relevant problems. The emphasis is on **gaining confidence** in applying what you know. This course gives you an opportunity to **consolidate and apply skills** learned in the extensive list of course prerequisites. The course is approximately half "chemical engineering" and half "problem solving and process skills." The course integrates technical skills and professional skills that you will apply for the rest of your career, **whether you continue as a chemical engineer or not**. 4N04 leads directly into your final design project in 4W06, where you will be expected to apply the skills practiced in this course along with new skills learned to complete a full design project from the ground-up.

Those that complete 4N04 are intended to achieve these goals:

L.1. Aim to become professional engineers that invest in lifelong learning

L.2. Develop confidence in exploiting research resources (libraries, internet resources, and reference books), and judge the quality of these resources

L.3. Develop skills to learn on their own (self-directed learning, **SDL**): define your goal, investigate the topic, and test/refine your learning

L.4. Appreciate and apply approaches for providing safety in process design and operation and recognize that process safety is of paramount importance

L.5. Appreciate engineering ethics and their role in professional engineering practice

L.6. Evaluate and compare the financial attractiveness of alternative engineering decisions

L.7. Thoroughly review a complex process system (via its process and instrumentation diagram) for all major categories of operability

L.8. Recognize that process equipment does not operate exactly as designed and will experience faults that must be handled safely

L.9. Systematically apply a troubleshooting a process by creating a hypothesis, performing experiments, and drawing valid conclusions

L.10. Manage group projects and interpersonal relations, especially building chairperson skills, preparing agendas, and diagnosing team dynamics

L.11. Clearly communicate by memo, formal report, and email

L.12. Make reasonable assumptions or perform necessary research to cope with ambiguity and uncertainty in required tasks

L.13. Develop skills in time management for managing projects and other activities

L.14. Appreciate economic principles as applied not only to engineering projects, but also personal finances

Why This Course Exists

Up until this point, all the courses you have taken in Chemical Engineering have taught you the fundamentals of being a Chemical Engineer both from technical (mass/heat transfer, balances, fluids, controls) and professional (collecting data, writing technical and lab reports) standpoints.

4N04 will build on these previously developed skills and have you apply them in a group setting while working on a comprehensive project. We will practice these group skills in smaller, tutorial-focused assignments as well.

Course References and Materials

There is no required textbook for this course. Rather, we will be using the materials developed over the last 30+ years by Dr. Don Woods and Thomas Marlin, and modernized by Kevin Dunn and myself. Links to past materials and references will be posted on the course A2L page and will be provided to you whenever necessary. I would only ask that you please respect the rights of the original authors of these documents and not share them with others outside of 4N04.

Some recommended texts are listed below. These are not mandatory but may serve as useful references for your course project (and for 4W06):

Author(s)	Title	Library Link	Amazon Link
Seider, Seader, Lewin & Widagdo	Product and Process Design Principles - Synthesis, Analysis and Evaluation	McMaster Library	Amazon
Turton, Bailie, Whiting, Shaeiwitz and Bhattacharyya	Analysis, Synthesis and Design of Chemical Processes	McMaster Library	Amazon
N. Lieberman and E. Lieberman	A Working Guide to Process Equipment	McMaster Library	Amazon
Perry and Green (Editors)	Perry's Chemical Engineers' Handbook (8th edition)	McMaster Library	Amazon
Uhlmann (and others)	Ullmann's Encyclopedia of Industrial Chemistry	McMaster Library	N/A
Woods	Process Design and Engineering Practice	McMaster Library	Amazon

You will likely use all kinds of other references throughout this project: articles, books, internet sources and so on. It is up to you to know how and when to use these resources and to reference them appropriately. Please remember to use an appropriate reference style when using external resources, even if you are using a website.

Course Website and Material Distribution

This course has an **Avenue to Learn (A2L)** course shell. All lecture notes, videos, past materials, project information, and announcements will be made on A2L. It is expected that you will check A2L daily, and it is your responsibility to ensure that you caught up on all course material. All assignments and will be distributed through **Microsoft Teams**.

Lecture Recordings

All lecture in this course will be in-person at the scheduled days and times. Echo360 software will be used to record the lectures. Recordings will be posted to the course YouTube channel once or twice per week.

I make no guarantees about the stability, reliability, or quality of Echo360. Please make a habit of coming to class live as we will be having frequent discussions that benefit live participation!

Course Format

Let's set the scene: In a method inspired by instructors of past 4N04 offerings, this course is going to act more like a workplace simulation than a typical instructor-student relationship. This will hopefully help get you some experience with industry projects and relationships as you head into the workplace beyond university. Let's call our company **Pelton Power**.

There will be weekly work tasks prescribed by your manager (Jake) and supervisors (TAs). These could easily consume a huge portion of your time. Your manager and his supervisors may ask for more than you think is possible to deliver on in the time available. Part of the learning experience of this course is for you to define the scope of the problem and provide a solution given the available time. Scoping the problem requires using your group's judgement and consulting with your manager and supervisors. Based on this, your group will set goals, develop a feasible plan, and complete the tasks within the allotted time.

Group Work: Over 50% of the assessments in this course will be in groups of **five** students. You will be assigned a group after the first class and will be expected to work as a team throughout the remainder of the term.

Your group will consist of yourself, [up to] **two** preferred team members and two other members assigned **randomly** by the instructor. This is intended to emulate a real-world scenario where you do not have complete control over who you will work with for a given project. Please note that once the groups are finalized, there will be no opportunities for changes. Along with your preferred group members, you will be required to **report which tutorials you are able to attend**. **Tutorial attendance is mandatory** (see the section on attendance below) and is thus a required meeting time for your group to work on assignments or components of your group project. This experience will help you build your group skills, both as a leader and supporter. If possible, the group should resolve conflicts based on established group norms. Important conflicts that cannot be resolved by the students should be discussed with myself as soon as possible. You will establish what is effective and acceptable group behaviour at the start of the course.

Attendance: While with other courses it may be acceptable to skip tutorials, failing to attend tutorials and other events in 4N04 where group work is required would be equivalent of not showing up at work, and leaving your colleagues to carry your load.

This semester is very busy because you will likely be participating in employment interviews and company visits. This complicates course grading and impacts your group work. If you **must** miss a tutorial or group activity, please follow this procedure:

1. Gain the agreement of the members of your group that you can miss a course activity.
2. Submit a written explanation to the course instructor before the absence. Details regarding your absence must be provided. The instructor will reply in writing.

This procedure **does not** replace the standard approach of contacting the Associate Dean of Engineering for medical or family reasons; these MSAFs will be dealt with, as needed, by the instructor. However, no one will be excused from the SDL Project or any examinations.

Feedback: Please feel free to give feedback personally to me at any time throughout this course. I am always looking to improve my methods and practices in this class and others. If you would prefer to provide constructive feedback anonymously, feel free to use the anonymous survey posted on the course A2L page.

Grading Policies

The grading for this course will be tailored to the importance of the task. The general breakdown of grades for 4N04 is as follows:

Task	Weight
Group Assignments and Tutorials *Assignments: 6 × 3% = 18%* *Participation (TS I, TS II, Safety): 3 × 2% = 6%*	24%
Group Project *Milestone 1: Process Walkthrough Review Participation = 2%* *Milestone 2: Cost Analysis Review Participation = 2%* *Milestone 3: PID Review Participation = 2%* *Final Report = 24%*	30%
Midterm Exam (Economics) *In-Person, Written Exam*	22%
Final Exam (Safety, Troubleshooting, Operability) *In-Person, Written Exam*	22%
Self-Reflection *Final Written Reflection Letter and Course Exit Survey*	2%
TOTAL	**100%**

Please note the following grading policies for 4N04:

- We require you to complete all group tasks in your groups. There are no exceptions to this rule: *individual hand-ins will not be graded*.
- Assemble a **single submission** for the group - the TAs will not grade collections if individual files. All group submissions must clearly show the names and student numbers of the group members.
- Grades for the **project** will be determined based on the group's result and the student's individual contribution. Grades may be modified based on peer evaluations.
- Every student must regularly provide a confidential peer evaluation of all other members in their group. This evaluation will be completed electronically. Each student will have his/her grade modified by the following formula for the project:

$$Student\ Grade\ = Group\ Grade \times \sqrt{\frac{Student\ Average\ Peer\ Score}{Group\ Average\ Peer\ Score}}$$

- The modifier factor under the square root is 1.0 for middle-of-the road performance, but can be higher or lower than this, depending on peer-assessment.
- Formative, **descriptive feedback is required in the peer evaluation**. This is to develop your skills at providing critique and development to your peers, as most of you will be in a position where you manage people in the future. Not providing this feedback will lead to individual penalties.
- The graded tutorials and workshops provide (a) feedback to students and (b) performance measures for grading. These graded exercises do not require extensive preparation; just keep up with the material.

- All material submitted must include a cover memorandum as defined in the course. The total grade for any task may be based entirely on the cover letter, at the discretion of the instructor. Substantial grades will be deducted for not following instructions *completely*; for example, you may receive -20% for not including a cover letter on an item of work. The deduction is at the discretion of the TAs and instructor.
- Wherever possible, submissions are evaluated in terms of what would be expected in engineering practice. This applies to the professionalism and clarity used in presenting your results such as accurate spelling and grammar, and the effective communication of any answers.
- Your group will receive the greatest benefit if you plan a strategy for the task where you **all** participate in **all** questions. A deeper understanding will come from reviewing each other's work in the same way that an engineer's work is always reviewed by their colleagues in companies around the world.
- Arrange to meet outside of class and review the work, discuss alternative approaches, and craft a single submission. You are defeating the purpose of the group-based assignment if you simply divide the task into sections and cut-and-paste a single submission without discussion. You also run the risk of losing marks due to any inaccuracies in your colleagues' work. Most importantly, you lose out on the learning opportunity of seeing your mistakes and group member's mistakes and learning from them. You also will not develop group collaboration skills, which are critical to succeed in any work environment.
- No sharing of any work may be done between groups. This will be strictly enforced. Please ensure that you have read the University's academic integrity policy (part of which is reproduced in the "Academic Honesty" section below).
- This is a large class, so late hand-ins interfere with the ability to efficiently grade your assignments. Late assignments will be penalized by deducting 25% per day for every late day. A grade of zero will be given for submissions handed in after the solutions are posted (usually within 2 days of the due date).
- No make-ups will be given for any part of the course (midterm, assignments and tutorials). Valid MSAFs will result in a 72-hour extension if appropriate. Group work cannot be MSAFed unless all members use an MSAF.
- Final percentage grades will be converted to letter grades using the Registrar's recommended procedure. Adjustment to the final grades may be done at the discretion of the instructor.

Group Work and Digital Submissions

The submission of assignments, project components, and other documents will take place on **MS Teams**. You will be required to join the course MS Teams shell at the beginning of the term, after which you will be assigned to a **private channel for your group**. In this private channel you will be expected to create repositories for assignment submissions and your final project report. The TAs will grade your submissions directly in your MS Teams channel to provide constant feedback and grades. You will not be required to submit anything via email or the A2L drop box in this course. Due dates will be enforced by checking the revision histories of every document to ensure they have not been edited past the due date.

You will receive extensive instructions on how to set up your MS Teams shell and the documents therein during the first tutorial session. The access code to MS Teams, should you need it, will be provided at the end of this syllabus and through a communication on A2L.

Peer Reviews

This course will use peer reviews to help teams assemble and calibrate their project deliverables. This mechanism is meant to provide you with low-stakes feedback from your peers and help you self-identify areas of improvement. You are expected to engage in the peer review process.

Submitting a suitable in-progress milestone for the sections of the report outlined in the grading section (walkthrough, economics, and PID) and providing meaningful feedback as evaluated by your peers will result in you receiving participation credit for 4N04.

This strategy was introduced due to feedback regarding a low number of touchpoints for the project throughout the term. You are now going to be able to see others' work and coach each other toward a better final project report, hopefully resulting in higher grades for everyone.

Academic Honesty

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. The online nature of courses now that we are coming out of the **C19 pandemic** will test these principles like never before.

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. **Note that these consequences will be enforced even when submitting OPTIONAL components**. 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://www.mcmaster.ca/academicintegrity.

- All graded submissions are to be completed **in your group only**, with no additional collaboration.
- Plagiarism, improper collaboration, copying unauthorized tests or aids, and other academic dishonesty will not be tolerated. **Your first offence will be reported** to the Office of Academic Integrity.
- The default penalty for academic dishonesty is a zero on the entire project / assignment / exam, even if the dishonesty occurred on just one portion or question of that project / assignment / exam. However, if Academic Integrity chooses to hold a hearing, they will determine the penalty.

Accessibility and Mental Health

The instructor aims to make this class accessible to all students. Please forward and optionally discuss any accommodation granted by Student Accessibility Services (SAS) with the instructor *before the third week of the course*. Please raise any other accessibility issues with the instructor as soon as possible, e.g. accessibility of the course website and course materials.

I am certified with the McMaster Professor Hippo on Campus Program for mental health awareness and aid to students in need. My office (or online video portal) is a **safe space** to discuss issues both academic and otherwise, and you are welcome to contact me at any time to chat. If I reach out to you at any time, be aware that it is not to embarrass or penalize you; it is because I care.

Anticipated Schedule of Topics

The topics that we should be able to cover in 4N04 this year will include those in the following table. Note that the sequence that material is covered is subject to change.

Section	Topics

Section 01
Engineering Economics
 	
5 Weeks
	• Introduction to time value of money
	  ○ Cash flow balances
	  ○ Interest and discount rates
	  ○ Present and Future value
	• Methods of valuation
	  ○ Lang factors and break-even points
	  ○ Net-present value
	  ○ Internal Rate of return
	• Taxation and depreciation
	• Sensitivity analysis
	• Process unit cost estimation
	  ○ Inflation/capacity/material/pressure factors
	  ○ Applications to chemical process industry

Section 02
Process Operability
 	
2 ⅓ Weeks
	• Introduction to operability
	  ○ Operating windows of common equipment
	  ○ Expanding and shrinking operating windows
	• Reliability
	  ○ Computing process reliability from equipment
	  ○ Improving reliability of equipment
	  ○ Connecting reliability to operability
	• Flexibility of process units
	  ○ The role of controls in flexibility
	  ○ Moving around the operating window
	• Transitions
	  ○ Startup/shutdown procedures
	  ○ Design allowances for startups and shutdowns

Section 03
Process Safety
 	
2 Weeks
	• Case studies of previous chemical plant disasters
	• The Six Layers of Safety and their Roles
	  ○ [1] Basic process control systems (BPCS)
	  ○ [2] Alarms and cues
	  ○ [3] Safety interlock systems (SIS)
	  ○ [4] Relief and material diversion
	  ○ [5/6] Containment and emergency response
	• **HAZOP**: **Haz**ard and **Op**erability Studies

Section 04
Troubleshooting
 	
1 Week
	• Process of troubleshooting method
	• Troubleshooting documentation
	• Brainstorming symptoms and root causes
	• Case studies
	  ○ In-Class fired heater example
	  ○ TWO WEEKS of tutorial case studies (6 total)

Anticipated Schedule of Topics (Continued)

Section	Topics

Section 05
Special Topics in Design
 	
⅔ Weeks
	• Process scheduling
	  ○ Minimization of dead time
	  ○ Batch time
	• Role of optimization in process design
	  ○ Superstructure design
	  ○ Flexible designs for volatile markets

Section 06
Professionalism and Ethics
 	
⅔ Weeks
	• Engineering Professionalism
	  ○ Existence of the PEO
	  ○ The role of licensing in the engineering practice
	• Engineering Ethics
	  ○ Existence of mobile truth
	  ○ Ethical dilemmas and case studies
	  ○ Identification, coalescence and communication of critical information to involved parties

C.E.A.B. Graduate Attributes

Certain courses in the chemical engineering curriculum collect indicator data related to the development of the attributes deemed critical for engineers according to the Canadian Engineering Accreditation Board (CEAB). These indicators will be assessed throughout the course and redacted samples of student work may be collected for submission to the CEAB during McMaster Engineering's accreditation cycle. The indicators assessed in ChE 4N04 are as follows:

- 4.2: Explores a breadth of potential solutions, considering their benefits and trade-offs as they relate to the project requirements.
- 4.4: Justifies and reflects on design decisions, giving consideration to limitations, assumptions, constraints and other relevant factors.
- 6.2 Manages interpersonal relationships, taking leadership responsibilities as needed.
- 8.1: Describes the duty of a Professional Engineer to the public, client, employer, and the profession.
- 10.1: Applies ethical frameworks and reasoning, including in situations where there are possible conflicting interests among the stakeholders.
- 11.1: Applies economic principles in decision making.
- 11.2: Plans and effectively manages a project's time, resources, and scope, following business practices as appropriate.
- 12.2: Seeks and acquires appropriate external information as required, including showing awareness of sources of information and ability to critically evaluate them.

The CEAB indicators listed above are mapped to the course learning outcomes as shown in the table at right. The CEAB accreditation process is an important component to curriculum design in engineering. If you have any questions or wish to be involved in the accreditation process, please let me know at neasej@mcmaster.ca.

Indicator	Learning Outcomes
4.2	L.4 L.8 L.12
4.4	L.3 L.4 L.7 L.8 L.9 L.12
6.2	L.1 L.10 L.13
8.1	L.5 L.11 L.12
10.1	L.5
11.1	L.6 L.12 L.14
11.2	L.10 L.13
12.2	L.1 L.2 L.3 L.13

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.

- **P**rofessionalism
- **R**esponsibility
- **O**wnership
- **C**uriosity
- **E**mpathy
- **S**elflessness
- **S**ervice

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**.

Getting Started

Before or close to the beginning of the term, I suggest you take the following actions to best prepare you for the course ahead:

- Ensure you have installed MS Teams on your computer. Info from McMaster's UTS can be found here.
- You should already have access to our MS Teams page – please let me know if you do not.
- You will need access to Aspen Plus in this course, which can only be used via the remote desktop login procedure provided by UTS. Please go here for instructions on how to log in remotely.

McMASTER APPROVED ADVISORY STATEMENTS

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-proceduresguidelines/

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

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. Avenue to Learn, 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, Avenue to Learn, 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 online 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 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 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, Avenue to Learn and/or McMaster email.