Civil Engineering
CIVENG – 2O04
Fluid Mechanics
Winter 2026

Instructor Information

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TA Information

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Class Times

Lectures: Tu 3:30PM – 4:20PM & Th 2:30PM – 4:20PM

Tutorials: Mo 12:30PM – 2:20PM (T01) & We 4:30PM – 6:20PM (T02)

Labs: Fr 2:30PM – 5:20PM (L01) & Mo 8:30AM – 11:20AM (L02)

Class Format

In Person

The topics in this course will be presented in a traditional lecture format, with emphasis on developing physical intuition and mathematical competency. Students are expected to attend and actively participate in the lectures. Tutorials will be used to review and practice key concepts presented in the lectures. Students are encouraged to actively participate in class discussions on Avenue. In-person attendance is required for this course.

Course Dates: 01/05/2026 – 04/07/2026

Units: 4.00

Course Delivery Mode: In Person

Course Description: Fluid properties; hydrostatics; continuity, momentum and energy equations; potential flow; laminar and turbulent flow; flow in closed conduits, transients, open channel flow; hydraulic cross-sections. Three lectures, one tutorial (two hours), one lab (three hours); second term Prerequisite(s): CIVENG 2P04, MATH 2Z03; credit or registration in MATH 2ZZ3 Antirequisite(s): MECHENG 3O04

Important Links

- Mosaic
- Avenue to Learn
- Student Accessibility Services - Accommodations
- McMaster University Library

Course Learning Outcomes

By the end of this course, students should be able to:

- Develop the competence in the specialized engineering knowledge of fluid mechanics.
- Obtain the ability to identify reasonable assumptions (including identification of

uncertainties and imprecise information) that could or should be made before a solution path is proposed.

- Obtain the ability to manage time and processes effectively, prioritizing competing demands to achieve personal and team goals and objectives.
- Develop the competence to construct effective written arguments

Graduate Attributes

The Canadian Engineering Accreditation Board (CEAB) is a division of Engineers Canada and is responsible for accrediting undergraduate engineering programs across Canada. Accreditation by the CEAB ensures that the engineering programs meet a national standard of quality and cover essential educational requirements. Graduate Attributes are a set of qualities and skills that the CEAB expects engineering graduates to possess. These attributes are a benchmark for the learning outcomes of accredited engineering programs. This section lists the Graduate Attribute Indicators associated with the Learning Outcomes in this course. CEAB Learning Indicators measured in this course as included in parenthesis above are:

1.3 Competence in Engineering Fundamentals

1.4 Competence in Specialized Engineering knowledge

2.1 Identifies and states reasonable assumptions and suitable engineering fundamentals, before proposing a solution path to a problem.

3.2 Synthesizes the results of an investigation to reach valid conclusions.

4.3 Develops models/prototypes; tests, evaluates, and iterates as appropriate.

5.1 Evaluates engineering tools, identifies their limitations, and selects, adapts, or extends them appropriately.

6.1 Actively contributes to the planning and execution of a team project.

7.2 Compases an effective written document for the intended audience.

11.2 Plans and effectively manages a project's time, resources, and scope, following business practices as appropriate.

Lab Information

You are required to participate in all four laboratory sessions. Each group member is expected to contribute equally to the lab report writing to receive mark

Lab Safety

The Faculty of Engineering is committed to McMaster University's Workplace and Environmental Health and Safety Policy which states: "Students are required by University policy to comply with all University health, safety and environmental programs". It is your responsibility to understand McMaster University Workplace and Environmental Health and Safety programs and policies. For information on these programs and policies please refer to McMaster University Health and Safety. The Lab Safety Handbook is available here, as well as on A2L.

It is also your responsibility to follow any specific Standard Operating Procedures (SOPs) provided for some of the experiments and the laboratory equipment. A laboratory-specific set of rules can also be added to ensure that students fully understand laboratory safety rules that are in place prior to their first session.

The first lab session will be a safety orientation to JHE 121. The safety requirements for JHE 121 are listed below. Students not abiding by these safety requirements will be given one warning. Second offences will result in the student being asked to vacate the laboratory and receiving a grade of zero for that lab.

- Always conduct yourself in a responsible manner while in the laboratory. Be prepared and professional. NO HORSEPLAY.
- Appropriate Personal Protective Equipment (PPE) should be worn when conducting experiments.
- Follow all written and verbal instructions carefully. If you do not understand a direction or part of a procedure, ASK YOUR TA or LAB TECHNICIAN BEFORE PROCEEDING WITH THE ACTIVITY.

- Perform only those experiments indicated by the lab manual or your TA/lab technician. Carefully follow all instructions, both written and oral. Unauthorized experiments are not allowed.
- No food or drink in the laboratory.
- Keep work areas clean and tidy. Place backpacks and overcoats in the cubbies provided.
- Be alert and proceed with caution at all times in the laboratory. Notify the TA or lab technician immediately of any unsafe conditions you observe.
- Stay focused on your lab procedures and do not interfere with others. Cell phones should only be used to record data.
- Dress appropriately for each laboratory activity as outlined by the lab supervisor and door signage for each lab.
- Report any accident (spill, breakage, etc.) or injury (cut, burn, etc.) to the TA or lab technician immediately.

Course Schedule

Week	Topic
Week 1	Introduction & Physical Properties of Fluids
Week 2	Fluid Statics
Week 3	Pressure on Surfaces
Week 4	Buoyancy and Stability
Week 5	Kinematics
Week 6	Conservation Equations
Week 7	Midterm Recess (No classes)
Week 8	Bernoulli’s Principles
Week 9	Momentum Principles

Week 10	Flow in Pipes
Week 11	Open Channel Flow
Week 12	Design of Open Channel Sections
Week 13	Specific Energy and Hydraulic Jumps
Week 14	Course Review

This schedule is tentative — the Instructor and the University reserve the right to modify elements of the course during the term. Any changes will be announced in class and/or posted on A2L.

Required Materials and Texts

Textbook Listing: https://textbooks.mcmaster.ca

There are no required materials and texts.

Optional Course Materials

Textbook Listing: https://textbooks.mcmaster.ca

Fundamentals of Fluid Mechanics

ISBN: 9780470262849

Authors: Bruce Roy Munson, T. H. Okiishi, Wade W. Huebsch

Publisher: Wiley

Publication Date: 2009

Edition: Sixth Edition

In addition, there are numerous text books on Fluid Mechanics available in the Thode Library.

Course Evaluation

Assessment	Weight
Assignments	20%
Laboratory Reports	20%
Midterm Exam	20%
Final Exam	40%

Laboratory reports are to be completed in groups of five. Equal contribution from each student is required to earn credit.

Grading Scale

Grade	Equivalent Grade Point	Equivalent Percentages
A+	12	90-100
A	11	85-89
A-	10	80-84
B+	9	77-79
B	8	73-76
B-	7	70-72
C+	6	67-69
C	5	63-66
C-	4	60-62
D+	3	57-59
D	2	53-56
D-	1	50-52
F	0	0-49

Late Submissions

Late submissions will not be accepted.

Absences, Missed Work, Illness

McMaster Student Absence Form (MSAF): In the event of an absence for medical or other reasons, students should review and follow the Academic Regulation in the Undergraduate Calendar “Requests for Relief for Missed Academic Term Work”. The McMaster Student Absence Form is a self-reporting tool for Undergraduate Students to report absences that last up to 5 days and provides the ability to request accommodation for any missed academic work. Please note, this tool cannot be used during any final examination period. You may submit a maximum of 1 Academic Work Missed requests per term. It is your responsibility to follow up with your Instructor immediately regarding the nature of the accommodation. If you are absent more than 5 days or exceed 1 request per term you must visit your Associate Dean's Office (Faculty Office). You may be required to provide supporting documentation. This form should be filled out immediately when you are about to return to class after your absence.

If the student submits an MSAF, the following reliefs are granted based on the missed work:

- Assignments: If a student submits an MSAF for a missed assignment, a one-week extension to the missed assignment is granted starting from the original listed deadline.

- Midterm: If a student submits an MSAF for the midterm exam, the student will be given a chance to take the exam on another date.

- Laboratory Reports: MSAF will NOT be accepted.

It is the student's responsibility to notify the instructor about the MSAF submission.

Communications

The major form of communication in this course will be the classroom. Therefore, course attendance is expected. There is also an avenue to learn site, where course notes, lab manuals, tutorial problem sets and other course materials will be posted.

In this course, we will be using avenue to learn site. 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 2 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. (From: http://www.mcmaster.ca/policy/Students-AcademicStudies/index.html – Undergraduate Course Management, accessed August 17th, 2016).

It is the student's responsibility to:

• Maintain current contact information with the University, including address, phone numbers, and emergency contact information.

• Use the University provided e-mail address or maintain a valid forwarding e-mail address.

• Regularly check the official University communications channels. Official University communications are considered received if sent by postal mail, by fax, or by e-mail to the student's designated primary e-mail account via their "@mcmaster.ca" alias.

• Accept that forwarded e-mails may be lost and that e-mail is considered received if sent via the student's @mcmaster.ca alias.

• Check the McMaster/Avenue email and course websites on a regular basis during the term.

Additional Information

- The McMaster Standard Calculator (Casio fx991) may be used on examinations.
- The marks on different components of the course will be maintained according to the percentage scale and only the final mark will be converted to a letter grade.
- Course notes will be posted on the 2O04 avenue to learn site in sections over the duration of the term. You may print these notes and add the necessary details during class, or you can take your own notes in class. The course notes are not intended to replace class or the text book.

Generativ AI: Use Prohibited

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.

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-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. 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 *McMaster Student Absence Form Policy (MSAF Policy)*.

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 ten (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.