

ME753 –Advanced Fluid Mechanics Fall 2020

Course Outline

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Course Website: Go to <http://mechfaculty.mcmaster.ca/~hamedm/> then click on Courses, then click on ME753 course site.

Important Announcements: Check important announcements on course website. **It is the student's responsibility to check the "Important Announcements" section on a regular basis.**

Suggested Textbooks:

- 1) "Fluid Mechanics", by P. K. Kundu and I. M. Cohen, 3rd edition, Academic Press, 2004.
- 2) "Viscous Fluid Flow", by Frank M. White, 2nd edition, McGraw-Hill, 1991.
- 3) "Boundary-Layer Theory" by H. Schlichting, 8th edition, Springer, 2000.

Lectures: There will be a weekly three-hour lecture On Tuesdays 9:00-12:00 PM in JHE-219. The first lecture is on Sept 15th.

Grading: The following distribution of marks will be used

Assignments:	25%
Mid-term	25%
Final exam:	50%

Assignments: Regular (roughly every week) assignments will be given. Assignments will be due in class on the date indicated on each assignment sheet. Late assignments **will not be accepted**. Although the students might discuss the problems among themselves, each student must turn in his/her own solution. Students may be asked to defend their papers orally.

The Mid-term Test: The mid-term test is an **open-book, in-class test**. Date and time TBA

Final Examination: The final exam is **an open-book, in-class** examination that will cover all lecture material. ***Student must pass the final exam to pass the course.*** The date and time of the final exam TBA.

Course Topics:

1. Cartesian Tensors.
2. Kinematics.
3. Conservation Laws.
4. Vorticity Dynamics.
5. Scaling and Dynamic Similarity.
6. Laminar Flows.
7. Boundary Layers – *timer permit.*
8. Introduction to Turbulence- *time permit*

Policy Reminders:

1. Academic Integrity

You are expected to exhibit honesty and use ethical behaviour in all aspects of the learning process. Academic credentials you earn are rooted in principles of honesty and academic integrity.

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

It is your responsibility to understand what constitutes academic dishonesty. For information on the various types of academic dishonesty please refer to the [Academic Integrity Policy \(https://www.mcmaster.ca/policy/Students-AcademicStudies/AcademicIntegrity.pdf\)](https://www.mcmaster.ca/policy/Students-AcademicStudies/AcademicIntegrity.pdf), located at www.mcmaster.ca/academicintegrity.

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.

2. 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 requiring a RISO accommodation 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.

3. Academic Accommodation of Students with Disabilities

Students with disabilities who require academic accommodation must contact [Student Accessibility Services \(SAS\)](#) to make arrangements with a Program Coordinator. [Student Accessibility Services](#) can be contacted by phone 905-525-9140 ext. 28652 or e-mail sas@mcmaster.ca. For further information, consult McMaster University's [Academic Accommodation of Students with Disabilities](#) policy.

4. 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.