Faculty of Engineering

Department of Mechanical Engineering

COURSE OUTLINE

MECH450E: Advanced Fluid Mechanics

Term – FALL 2016 (201609)

Instructor	**Office Hours**
Dr. Rustom Bhiladvala	Days: Thursday
Phone: 721-8616	Time: 2:30-3:30 (other times by arrangement)
E-mail: rustomb@uvic.ca	Location: EOW521

List all prerequisites and co-requisites: *MECH345*

LECTURE DAYS/TIME

MECH450E: CRN 12294	Days: Mondays	Time: 3:30-6:30 pm	Location: HHB116

NO LABORATORY SEGMENT FOR THIS COURSE

TA Name	**E-mail**	**Office**
Farzam Allafchi	allafchi.farzam@gmail.com	EOW225
Office hours: Thursday 10:00-11:00 (other times by arrangement)		

Required Text	**Other Texts**
Title: Viscous Fluid Flow, 3rd Edition (2006)	Batchelor, G.K., An Introduction to Fluid Dynamics, Cambridge, 1967.
Author: Frank M White	Schlichting, H., Boundary Layer Theory, McGraw-Hill, 2000.
Publisher/Year: Mc Graw Hill	Panton, R.L., Incompressible Flow, John Wiley & Sons, 1996.
Useful Texts for Review of Introductory Fluid Mechanics **Fluid Mechanics (1)** F.M. White & **(2)** Y.A. Cengel & J.M. Cimbala	

COURSE OBJECTIVES:

The aim of this course is to develop an advanced understanding of the laws of fluid mechanics, with ability to utilize the appropriate theoretical models to approach problems involving laminar and turbulent viscous flows, with some consideration of irrotational flows. This course builds on and extends material introduced in the pre-requisite course and relates to other courses addressing aerodynamics, convective heat transfer and fluid microscale mechanics.

Course topics: governing principles; continuity, momentum, energy, stress, constitutive relations. Viscous incompressible flow; exact solutions of Navier-Stokes equations. Boundary-layer theory. Turbulent flow. Low Reynolds number flow. Potential flow.

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LEARNING OUTCOMES: At the end of this course, students will be able to:

1) Identify regimes of fluid flow associated with situations presented in nature and technology.
2) Identify and be prepared to use appropriate theoretical models for first quantitative estimates.
3) Use non-dimensionalization of governing equations and the selection of appropriate parameters for planning detailed computational studies of flow problems.

Weight & Date(s) of Assessments:	Weight	Date
Assignments:	20%	
Pop Quizzes	Bonus Marks	Any time
Mid-term	30%	Date: Mon Oct 17th, during class hours.
Final Exam	50%	Date: To be fixed by UVic Campus-wide Exam Scheduling

Assessment Notes: Failure to pass the final exam will result in a failing grade for the course if the score on other assessment components is less than 25/50. If not and the final exam failure is marginal, a supplemental final exam may be scheduled at the discretion of the instructor. Other rules for supplemental examinations can be found in the current Undergraduate Calendar.

The final grade obtained from the above marking scheme for the purpose of GPA calculation will be based on the percentage-to-grade point conversion table as listed in the current Undergraduate Calendar.

ASSIGNMENTS

Problem sets (a total of 6 ± 1) will be distributed over the course of the term, via the Coursespaces site. They will typically require knowledge of principles, derivation of equations and the use of calculations for quantitative estimation. Assignments (hardcopy) are due in the course dropbox near ELW A136.

COURSE LECTURE NOTES

Unless otherwise noted, all course materials supplied to students in this course have been prepared by the instructor and are intended for use in this course only. These materials are NOT to be re-circulated digitally, whether by email or by uploading or copying to websites, or to others not enrolled in this course. Violation of this policy may in some cases constitute a breach of academic integrity as defined in the UVic Calendar.

Assignment of E grade and supplemental examination for this course will be at the discretion of the Course Instructor. The rules for supplemental examinations can be found in the current Undergraduate Calendar.

GENERAL INFORMATION

Note to Students:

Students who have issues with the conduct of the course should discuss them with the instructor first. If these discussions do not resolve the issue, then students should feel free to contact the Chair of the Department by email or the Chair's Secretary to set up an appointment.

Attendance

Students are expected to attend all classes in which they are enrolled. An academic unit may require a student to withdraw from a course if the student is registered in another course that occurs at the same time….

An instructor may refuse a student admission to a lecture, laboratory, online course discussion or learning activity, tutorial or other learning activity set out in the course outline because of lateness, misconduct, inattention or failure to meet the responsibilities of the course set out in the course outline. Students who neglect their academic work may be assigned a final grade of N or debarred from final examinations.

Students who do not attend classes must not assume that they have been dropped from a course by an academic unit or an

instructor. Courses that are not formally dropped will be given a failing grade, students may be required to withdraw and will be required to pay the tuition fee for the course." UVic Calendar, (2016) http://web.uvic.ca/calendar2016-09/undergrad/info/regulations/attendance.html

Accommodation of Religious Observance (AC1210)
http://web.uvic.ca/calendar2016-09/general/policies.html

Discrimination and Harassment Policy (GV0205)
http://web.uvic.ca/calendar2016-09/general/policies.html

Faculty of Engineering, University of Victoria
Standards for Professional Behaviour

"It is the responsibility of all members of the Faculty of Engineering, students, staff and faculty, to adhere to and promote standards of professional behaviour that support an effective learning environment that prepares graduates for careers as professionals…."

You are advised to read the Faculty of Engineering document Standards for Professional Behaviour which contains important information regarding conduct in courses, labs, and in the general use of facilities.
http://www.uvic.ca/engineering/assets/docs/professional-behaviour.pdf

Cheating, plagiarism and other forms of academic fraud are taken very seriously by both the University and the Department. You should consult the Undergraduate Calendar for the UVic policy on academic integrity.

Policy on Academic Integrity
http://web.uvic.ca/calendar2016-09/undergrad/info/regulations/academic-integrity.html

Course Schedule

Module	Topics	Date/Week
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