Mech 280: January 2016

▪ **Instructor:** Professor Ian A. Frigaard ICSIS room 177 frigaard@math.ubc.ca	▪ **Teaching Assistants:** Amir Maleki & Emad Chaparian Mechanical Engineering amir.maleki.zamenjani@gmail.com e.chaparian@gmail.com

Regular schedule:

***Lectures*:** Mon, Wed, Fri,
10.00-11.00 in GEOG 212
Tutorials: Mon & Fri,
11.00-12.00 in LASR 102

Note that we will use some tutorials for quizzes

Course material:

***Lecture notes*:** are available in pdf format from UBC connect

***Text*:** There is no required text. This is an introductory course and the material can be found for free in many places online. An optional text that the course approximately follows is:

- Fundamental of Fluid Mechanics, 7th edition, by Munson, Young, Okiishi & Huebsch. Electronic versions are available for around $62.00. The course covers chapters 1-8 & 12.
- In previous years we have followed: Fluid Mechanics, by Cengel & Cimbala (McGraw-Hill). The course covers chapters 1-9 & 14.

Grading: 2 x midterms (total 30%); 4 x assignments (total 20%); 1 x final exam (50%). The policy of the course is that you will need to get a passing grade on the examined parts of the course in order to pass the course, i.e. your assignment grade % will be capped by your exam & midterm grades if you do not score over 50% on those parts of the course.

- Midterm 1: Monday 1st February, 11.00-12.00 in LASR 102; (50 minutes: 15%)
- Midterm 2: Friday 11th March, 11.00-12.00 in LASR 102; (50 minutes: 15%)

Assignments: 4 sets of assignment problems will be posted online, with due dates. The tutorials will cover similar problems. Selected problems from these sets will be graded (4 x 5%). Kindly present your work in a legible and organized manner, that you feel that you would be able to mark.

Final exam: Typically 5 longish questions. Examples of previous exams will be made available

Office hours: by arrangement if needed. There are many tutorials and opportunities to ask myself or the TA's for help.

I usually do not respond to e-mail enquiries as I simply have insufficient time to do so. If you do e-mail always pre-fix with subject MECH280

Week Starting	Monday	Wednesday	Friday
1: 4th January		Frigaard: L1; GEOG212	Frigaard: L2; GEOG212 Maleki: T1; LASR102
2: 11th January	Frigaard: L3; GEOG212 Frigaard: L4; LASR102	Frigaard: L5; GEOG212	Frigaard: L6; GEOG212 Maleki: T2; LASR102
3: 18th January	Frigaard: L7; GEOG212 Maleki: T3; LASR102	Frigaard: L8; GEOG212	Frigaard: L9; GEOG212 Maleki: T4; LASR102
4: 25th January	Frigaard: L10; GEOG212 Chaparian: T5; LASR102	Frigaard: L11; GEOG212	Frigaard: L12; GEOG212 Chaparian: T6; LASR102
5: 1st February	Frigaard: L13; GEOG212 Midterm 1: LASR102	Frigaard: L14; GEOG212	Frigaard: L15; GEOG212 Chaparian: T7; LASR102
6: 8th February	Family Day: Holiday	Frigaard: L16; GEOG212	Frigaard: L17; GEOG212 Chaparian: T8; LASR102
Spring Break			
8: 22nd February	Frigaard: L18; GEOG212 Chaparian: T9; LASR102	Maleki: L19; GEOG212	Maleki: L20; GEOG212 Chaparian: T10: LASR102
9: 29th February	Maleki: L21; GEOG212 Chaparian: T11; LASR102	Maleki: L22; GEOG212	Frigaard: L23; GEOG212 Maleki: T12; LASR102
10: 7th March	Frigaard: L24; GEOG212 Frigaard: L25; LASR102	Frigaard: L26; GEOG212	Maleki: T13; GEOG212 Midterm 2; LASR102
11: 14th March	Frigaard: L27; GEOG212 Frigaard: L28; LASR102	Frigaard: L29; GEOG212	Frigaard: L30; GEOG212 Chaparian: T14 LASR102
12: 21st March	Frigaard: L31; GEOG212 Chaparian: T15; LASR102	Frigaard: L32; GEOG212	Good Friday: Holiday
13: 28th March	Easter Monday: Holiday	Maleki: L33; GEOG212	Maleki: L34; GEOG212 Chaparian: T16; LASR102
13: 4th April	Maleki: L35; GEOG212 Maleki: T17; LASR102	Maleki: L36; GEOG212	Frigaard: GEOG212 Maleki: T18; LASR102

Lectures	Duration	Topic	Tutorials
L1-L2 Frigaard	2 x 50	Module 1: Basic concepts, Viscosity, Surface tension	T1 Maleki
L3-L9 Frigaard	7 x 50	Module 2: Hydrostatics Hydrostatic pressure, Forces on surfaces, Archimedes, Stability of floating objects	T2-T4 Maleki
L10-L18 Frigaard	9 x 50	Module 3: Kinematics, Bernoulli's equation, HGL, EGL Control volume analyses: Reynolds transport theorem, Conservation of mass, Conservation of linear momentum, Non-inertial frames, conservation of angular momentum, Conservation of energy	T5-T9 Chaparian
L19-L22 Maleki	4 x 50	Module 4: Navier-Stokes equations, solving simple flows, inviscid flows, turbulence introduction	T10-T11 Chaparian
L23-L26 Frigaard	4 x 50	Module 5: Buckingham Pi theorem, Dimensional analysis, Scaling and simplifying equations	T12-T13 Maleki
L27-L32 Frigaard	6 x 50	Module 6: Pipe flows, Minor losses, Networks	T14-T16 Chaparian
L33-L36 Maleki	4 x 50	Module 7: Centrifugal pumps	T17-T18 Maleki