Université d'Ottawa
Département de
génie mécanique

uOttawa

University of Ottawa
Department of
mechanical engineering

MCG 3340, Fluid Mechanics I

Fall, 2017

Instructor: Dr. James M^{c}Donald

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Office hours:	Thursday, 2:00 – 4:00
	(Subject to change)

Teaching Assistants:

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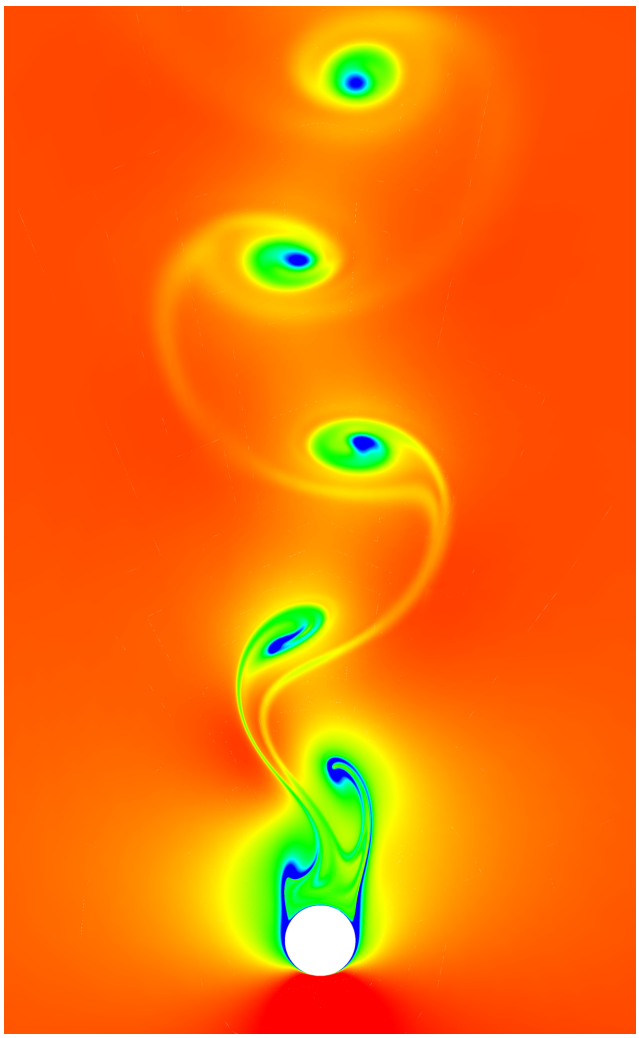

Lectures: STE H0104

Monday	1:00 – 2:30
Wednesday	11:30 – 1:00

Tutorials:

Friday	10:00 – 11:30, SMD 425
	14:30 – 16:00, TBT 070

The first tutorials will be on Friday, September 15th.

Labs: CBY B-206
Experiments will be scheduled for October and November. All students will participate in **one** three-hour session. **It is required to complete the labs to pass the course**.

Lecture Notes: Lecture notes will be made available throughout the course.

Suggested textbook: Introduction to Fluid Mechanics
Fox, Prichard, & M^{c}Donald
7th, 8th, or 9th edition.

Course Description:
Fundamental concepts. Fluid statics. Fundamental laws of fluid motion. Dimensional analysis and similitude. Internal flows.

Evaluation: All components of the course must be completed to pass the course.

Homeworks (two or three per month, a selection of the problems will be corrected, but only if all problems are attempted.)	10%
Lab reports	10%
Test (closed book) – October 13th, in DGD	20%
Test (closed book) – November 17th, in DGD	20%
Final Exam (closed book)	40%

Topics:

1. Mathematics review
2. Definition of a fluid and fundamental concepts
3. Fluid statics:
    - Variation of pressure in a fluid at rest
    - Hydrostatic forces and moments on submerged surfaces
    - Buoyancy
    - Fluids in rigid-body motion
4. Fluid Dynamics: control-volume (or integral) method
    - Control volumes and Reynolds transport theorem
    - Conservation of mass
    - Conservation of linear momentum
    - Bernoulli's equation
    - Conservation of energy
5. Introduction to viscous flows:
    - Viscosity
    - Newtonian and non-Newtonian Fluids
6. Dimensional Analysis
7. Viscous flows:
    - Laminar and turbulent flows
    - Internal viscous flows

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