

MCG 3340, Fluid Mechanics I
Fall, 2014

Instructeur: Dr. James M^cDonald

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Office hours: Tuesday, 2:00 - 4:00

Teaching Assistants:

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Lectures: MRT 212

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

Tutorials: TBT 0019 and TBT 325

Wednesday 8:30 - 10:00

The first tutorials will be on Wednesday, September 17th.

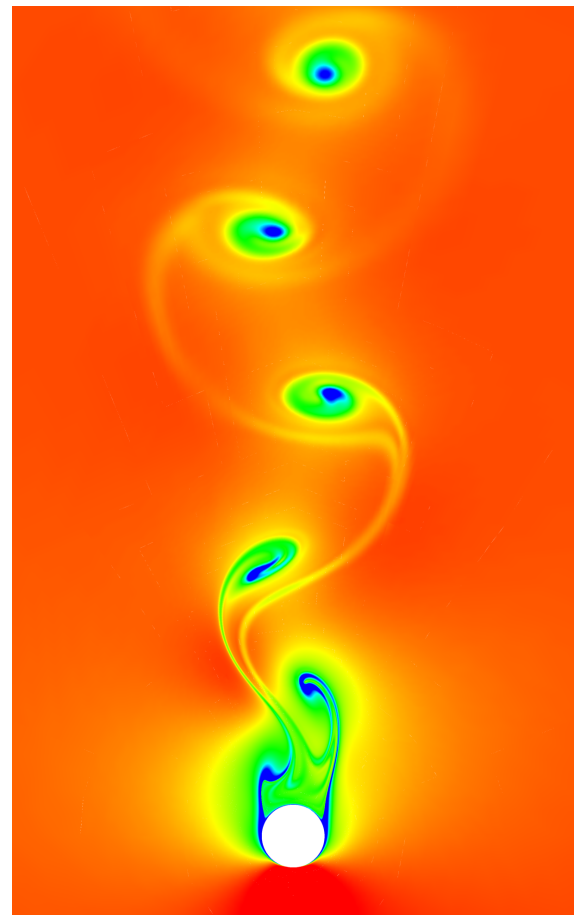
Labs: CBY B-206

Experiments will be scheduled in October and November.

It is required to complete the labs to pass the course.

Suggested textbook: Introduction to Fluid Mechanics

Fox, Prichard, & M^cDonald
8th edition



Course Description:

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

Evaluation:

Homeworks (three or four per month, a selection of the problems will be corrected)	10%
Lab reports	10%
Test (closed book) - October 8 th , in class	20%
Test (closed book) - November 5 th , in class	20%
Final Exam (closed book)	40%

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

Topics:

Section numbers follow those in the suggested text.

- 1. Definition of a fluid and fundamental concepts 1.1–1.8 et 2.1–2.7
- 2. Fluid statics:
 - Variation of pressure in a fluid at rest 3.3
 - Hydrostatic forces on submerged surfaces 3.5
 - Buoyancy and stability 3.6
 - Fluids in rigid-body motion 3.7
- 3. Fluid Dynamics: control-volume (or integral) method
 - Control volumes and Reynolds transport theorem 4.2
 - Conservation of mass 4.3
 - Conservation of linear momentum 4.4–4.7
 - Bernoulli’s equation 4.4, 6.3–6.5
 - Conservation of energy 4.8
- 4. Introduction to viscous flows:
 - Viscosity 2.4
 - The Navier-Stokes equations 5.4
- 5. Dimensional Analysis: 7.1–7.7
- 6. Viscous flows:
 - Laminar and turbulent flows 8.1–8.3
 - Internal viscous flows 8.4–8.12

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All regulations regarding academic fraud apply:

<http://web5.uottawa.ca/mcs-smc/academicintegrity/regulation.php>