

Sarah N. Giddings Lab



Introduction to Fluid Mechanics 2015

SIO 214a Introduction to Fluid Mechanics (section 851232), Fall 2015 (4 units)

syllabus & course information

Instructors: [Sarah Giddings](#) & Myrl Hendershott

Class times: Sept 25 – Dec 4, Tu 9:30-10:50, Fri 15:30-16:40

Problem sessions: Tu 11:00-11:50 (immediately following class)

Location: Vaughn Hall, room 100

Office hours: Mon 08:00-11:00, MESOM 363, or [email me](#) or [Myrl](#) to set up an appointment

course summary:

A survey of classical problems in fluid mechanics and approximate techniques of analysis. Topics include conservation equations, straight laminar flows, low and high Reynolds number laminar flow, stability of laminar flows, turbulent flow. **Prerequisites:** graduate standing or consent of instructor.

course schedule (see [here for course notes](#)):

* Week 1-2: Introduction, mathematics refresher, kinematics

* Week 2-3: Conservation laws

* Week 4: Vorticity, Reynolds experiment

* Week 5 – 10: Problem vignettes (Bernoulli, Blasius boundary layer, Plane-Couette flow, wind driven flow on a lake, lubrication problem, gravity current, horizontal convection, Raleigh Bernard, lift/drag, instability, etc.)

credit & homework:

Participation in class and problem sessions is critical as we expect you to become proficient at problem solving and intuitive reasoning. While many of the assignments, mini-labs, and participation are not directly graded, a lack of engagement and understanding will be evident during the final exam. Grades will be based on homework (not graded but must participate in problem sessions, turn in homework, and make your own corrections, 20%), mid-term (20%), and an oral final exam (60%).

Textbooks:

Fluid Mechanics by Kundu & Cohen, Academic Press (3rd, 4th, 5th or 6th edition)

The 5th edition, with one more coauthor Dowling is now [available online](#)

Additional optional textbooks:

Introduction to Fluid Mechanics, G. K. Batchelor, Cambridge University Press.

Fluid Mechanics, Lev D. Landau and Evgeny M. Lifschitz, 1959, Pergamon Press.

Lectures on Geophysical Fluid Dynamics, R. Salmon, 1998, Oxford University Press.

CONTACT US

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