

**University Of California, Berkeley
Department of Mechanical Engineering**

ME 106: Fluid Mechanics (3 units)

Undergraduate Required Course

Syllabus

CATALOG DESCRIPTION

Three hours of lecture and one hour of discussion per week. This course introduces the fundamentals and techniques of fluid mechanics with the aim of describing and controlling engineering flows.

COURSE PREREQUISITES

ME C85 and ME 104 (ME 104 can be taken concurrently)

TEXTBOOK(S) AND/OR OTHER REQUIRED MATERIAL

Proficiency in fundamentals of mechanics and thermodynamics, and in mathematics inasmuch as it is needed for that proficiency. Familiarity with conservation principles, vector calculus, and differential equations. Computationally, proficiency in a high level programming environment (e.g. C/C++, Fortran, Mathematica, Matlab, IDL) to design algorithms and perform calculations. A text book or a set of notes may be required, at the discretion of the instructor.

COURSE OBJECTIVES

To develop a fundamental understanding of the science and engineering of fluid mechanics, through rigorous theoretical discussions, analytical examples, practical applications, and computational projects.

DESIRED COURSE OUTCOMES

Be able to analyze and design fluid mechanics components, and acquire the skill requisite to take part in any complex fluid mechanics systems.

TOPICS COVERED

Fluid properties, hydrostatics, conservation equations, analytic description of simple flows, flow measurement, empirical description of engineering flows, similitude, lift, drag, boundary layers, compressible flows, some engineering applications.

CLASS/LABORATORY SCHEDULE

Three hours of lecture per week.

CONTRIBUTION OF THE COURSE TO MEETING THE PROFESSIONAL COMPONENT

Equip a well-rounded engineer with fundamentals of fluid mechanics.

RELATIONSHIP OF THE COURSE TO ABET PROGRAM OUTCOMES

- (a) an ability to apply knowledge of mathematics, science, and engineering
- (b) an ability to design and conduct experiments, as well as to analyze and interpret data
- (e) an ability to identify, formulate, and solve engineering problems
- (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

ASSESSMENT OF STUDENT PROGRESS TOWARD COURSE OBJECTIVES

Extensive homework, projects (typically three) and a midterm and a final exam.

PERSON(S) WHO PREPARED THIS DESCRIPTION:

Ömer Savaş, 15 September 2010

ABBREVIATED TRANSCRIPT TITLE (19 SPACES MAXIMUM): Fluid Mechanics

TIE CODE: LECS

GRADING: Letter

SEMESTER OFFERED: Fall and Spring

COURSES THAT WILL RESTRICT CREDIT: None

INSTRUCTORS: Staff

DURATION OF COURSE: 14 Weeks

EST. TOTAL NUMBER OF REQUIRED HRS OF STUDENT WORK PER WEEK: 9

IS COURSE REPEATABLE FOR CREDIT? No

CROSSLIST: None