

## ESC 350 – Fluid Mechanics Syllabus

### Credit

4 semester hours

3 hours of lecture per week, 3 hours of lab per week

### Prerequisites

PHY 151 or 251 and MAT 122.

### Course Description

Comprehensive first course in basic and applied fluid mechanics. Topics covered will include: fluid properties under static and dynamic conditions, Euler's and Bernoulli's equations, hydrodynamics, dimensional analysis and similitude, laminar and turbulent flows, boundary layer model and approximate analysis, compressible flow and propulsion devices, flow measurement, and an introduction to turbomachinery with applications..

### Rationale for Course

Knowledge and understanding of fluid mechanics are required to analyze any system in which a fluid is the working medium. For example, one might be interested in the motion of airplanes or submarines or the operation of a particular fluid pump.

### Learning Objectives

To introduce the student to the basic laws and physical principles that provide a starting point in the analysis of any problem in fluid mechanics.

### Academic Integrity

Students are expected to be honest and to submit their own work on exams and research papers. Strict adherence to the Mississippi College "Honesty Policy" (*2009-2010 Mississippi College Undergraduate Bulletin, pg. 60*) will be followed.

### Course Outline

- Fluid Statics
- Control Volume Forms of Basic Equations
- Differential Forms of Basic Equations
- Dimensional Analysis
- Viscous Incompressible Flows
- Fluid Machinery
- Compressible Flows

### Methods of Instruction

Presentation of course material will be accomplished through a combination of lectures (oral and audio-visual), demonstrations, laboratory sessions and possibly reading assignments.

### Recommended Text

*Introduction to Fluid Mechanics, 6th Edition*; Fox, McDonald and Pritchard; John Wiley and Sons

**Grading**

Final grades will normally be determined by the average scores on a number of examinations as well as some weighted average of homework assignments. Laboratory reports will account for twenty percent of the final grade. Topical reports may also be assigned by the instructor. A ten point scale will be used to assign letter grades.

**Makeup Tests**

Makeup tests will be given only under the following circumstances:

- Consent of the instructor has been obtained prior to the test.
- An excused absence is obtained from a doctor or the Vice-President for Academic Affairs

**Absences**

Mississippi College policies on attendance and academic integrity will be enforced. Please see the *2009-2010 Mississippi College Undergraduate Bulletin*, pg. 56-57 for additional details of these policies. Students are responsible for all work missed during an absence.

**Special Needs**

If you need special accommodations due to learning, physical, psychological, or other disabilities, please contact Dr. Buddy Wagner in the Counseling and Career Development Center. He may be reached by phone at 601-925-3354