

COURSE NUMBER: ME 3332, 3 credits	COURSE TITLE: Thermal Sciences II
TERMS OFFERED: Fall, Spring, Summer	PREREQUISITES: Math 2243, ME 3331, ME upper division
TEXTBOOKS/REQUIRED MATERIAL: <i>Fundamentals of Fluid Mechanics</i> , B.R. Munson, D.F. Young, T. H. Okiishi, 3 rd Edition, John-Wiley, New York, 1998 <i>Fluid Mechanics</i> , F.M. White, 4 th Edition, McGraw-Hill, 1999 (representative)	COGNIZANT FACULTY: THT Staff DATE OF PREPARATION: <i>10 April 2007</i>
COURSE LEADER(S): THT Staff	CLASS/LABORATORY SCHEDULE: Three 50-minute lectures / week One 50-minute recitation / week CONTRIBUTION OF COURSE TO MEETING PROFESSION OBJECTIVES: 100% Engineering Topics
CATALOG DESCRIPTION: Mass, momentum conservation principles. Fluid statics, Bernoulli equation. Control volume analysis, dimensional analysis, internal/external viscous flow. Momentum and energy considerations. Introduction to hydrodynamic and thermal boundary layers.	COURSE TOPICS 1. Fluid properties 2. Fluid statics 3. Ideal fluids, Bernoulli equation 4. Reynolds transport theorem 5. Control volume analysis 6. Introduction to differential analysis 7. Dimensional analysis 8. Internal & external viscous flows

COURSE OBJECTIVES	<ol style="list-style-type: none"> 1. Understand properties particular to viscous & inviscid fluids. 2. Develop an orderly systematic approach to problem solving for fluids at rest (statics) and for fluids in motion. 3. Demonstrate the appropriate use of the Bernoulli equation and understand its limitations. 4. Understand the use of control volumes and differential equations in the solution of problems in fluid mechanics. 5. Demonstrate the use of dimensional analysis 6. Understand the role of the hydrodynamic boundary layer in viscous flow 7. Demonstrate an understanding of internal and external viscous flow. 8. Develop an understanding of laminar, transitional, and turbulent flows 9. Use the principles of fluid mechanics in engineering design and product development.
COURSE OUTCOMES	<p>(Letters shown in brackets are linked to program outcomes a-k.) At the conclusion of the course, the students will be able to:</p> <ol style="list-style-type: none"> 1. Describe the meaning of the basic laws of fluid mechanics both qualitatively and quantitatively [a, k] 2. Perform mass, energy, and linear momentum balances for open and closed control volumes (both macroscopic and differential elements) [a, k] 3. Apply the theoretical and empirical laws of fluid mechanics for the solution of problems involving viscous and inviscid internal and external flows, including laminar and turbulent flow situations. [a, e, k] 4. Introduce students to fluid handling systems, which might include one or more of the following: fan and pump laws; matching pump curves and system curves; and common fluid measurement equipment [a, c, e, g, k]
ASSESSMENT TOOLS	<ol style="list-style-type: none"> 1. Mid-term exams (2-4) and a 2 hour comprehensive final exam 2. In class problems and discussions 3. Weekly homework problems and quizzes.

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Nature of Changes:

- *Class will always meet a minimum of 4 times per week (during day school)*
- *Course Outcomes 2-4 were rewritten based on feedback from Outcome Assessment team and deliberations of the THT faculty. More detail can be found in Outcome Assessment report for ME 3332.*