Course Syllabus
Southeast Missouri State University

Department of Physics and Engineering Physics       Course No. EP-363

Title of Course: Thermal-Fluid Engineering       New Course: Fall 2009

I. Catalog Description:

Introduction to the laws of thermodynamics, concept of control volumes, thermodynamic properties of materials, behavior of ideal gases, introduction to basic heat transfer modes, introduction to fluid mechanics and Bernoulli’s equation. Prerequisite(s): EP 263, MA 350. (3)

II. Prerequisite

EP-263 Mechanics of Materials
MA-350 Differential Equations I

III. Course Objectives: Upon completion of the course, students will be able to:

A. Understand the fundamental concepts of heat transfer and fluid mechanics.

B. Understand the application of various formulations such as energy equation, continuity, etc., with an emphasis on conduction and convection.

C. Formulate these quantities and correlate between them to understand or design an engineering problem.

D. Explain basic modeling approach and acquire problem solving skills necessary to solve heat transfer and fluid mechanics problems.

IV. Expectation of Students

A. Attend class regularly, participate in classroom discussions, and work all assigned homework problems.

B. Develop proficiency in the fluid statics and heat transfer formulation.

C. Demonstrate competence by performing satisfactorily on examinations.

D. Develop basic understanding of the modeling, design, and analysis.
<table>
<thead>
<tr>
<th>V. Course Outline:</th>
<th>Approx. Course Hours</th>
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<tbody>
<tr>
<td>A. Introduction to basic thermodynamics.</td>
<td>3</td>
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<tr>
<td>B. Differential form of Basic Conservation Equations, Navier-Stokes Equations</td>
<td>5</td>
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<td>C. Bernouilli’s equation</td>
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<tr>
<td>D. Flow Fields and Fluid Statics</td>
<td>7</td>
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<tr>
<td>E. Test 1</td>
<td>1</td>
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<tr>
<td>F. Heat Transfer Introduction</td>
<td>2</td>
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<td>G. 1-D steady state conduction</td>
<td>5</td>
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<tr>
<td>H. 2-D steady state conduction</td>
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<tr>
<td>I. Convective heat transfer</td>
<td>6</td>
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<tr>
<td>J. Test 2</td>
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<tr>
<td>K. Radiative heat transfer</td>
<td>6</td>
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**VI. Textbooks**


VII. Student Evaluation:

A. Tests (2)  
   \[ 250 \times 2 = 500 \text{ points} \]

B. Homework and quizzes  
   \[ 200 \text{ points} \]

C. Final Exam  
   \[ 300 \text{ points} \]

The distribution of points will vary by instructor.

VIII. Academic Policy Statement:

Students will be expected to abide by the University Policy for Academic honesty regarding plagiarism and academic honesty. Refer to:  
[http://ww6.semo.edu/judaffairs/code.html](http://ww6.semo.edu/judaffairs/code.html)

IX. Student with Disabilities Statement

If a student has a special need addressed by the Americans with Disabilities Act (ADA) and requires materials in an alternative format, please notify the instructor at the beginning of the course. Reasonable efforts will be made to accommodate special needs.