

**Library Resource Form Required for New Non-Gen-Ed**

Submission Deadlines: Fall - October 11, 2005 Spring - February 14, 2006

**TITLE** Emerging Topics in Mechanical Engineering

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**DEPARTMENT** Mechanical Engineering  
**College** College of Engineering

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**Signatures Required: representing a**

**date**

Department Chair: [Signature] Date: 1/24/06  
Department CURRICULUM Chair: [Signature] Date: 1/27/06  
Academic DEAN: [Signature] Date: 1/27/06

COLLEGE CURRICULUM COMMITTEE: Open Hearing Date: 4/21/06  
Approved:   
Not Approved:

Signature: College Curriculum Chair [Signature]

Signature: SENATE CURRICULUM CHAIR [Signature]  
Date: 5/9/06

Comments: \_\_\_\_\_  
\_\_\_\_\_

Signature: Executive Vice President/Provost: [Signature]  
Date: 6/14/06  
Approved:   
Not Approved:

Signature: REGISTRAR [Signature]  
Date: 6/15/06 Course Description Received & Approved  
Hegis Taxonomy & Course # ME 10.403

Notification Forward:

<input type="checkbox"/> SCC CHAIR	<input type="checkbox"/> Academic Dean
<input type="checkbox"/> IR	<input type="checkbox"/> Department Chair
<input type="checkbox"/> CAP	<input type="checkbox"/> VP/Student Affairs
<input type="checkbox"/> Registrar	<input type="checkbox"/> Other-

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6/15/06

## **Minor Change: Prerequisite and Description for Emerging Topics**

### **1. Details**

- A) Course Title: Emerging Topics in Mechanical Engineering
- B) Course number: 0910.403
- C) Sponsor: Dr. Hong Zhang and Mechanical Engineering faculty
- D) Credit Hours: 2 credit hours
- E) Course Level: Senior
- F) Description of Changes: The prerequisite and description of the course is changed from:

(Prerequisite: 0906.311 Heat Transfer Processes or equivalent)

This course will introduce emerging technologies and designs for microscale machinery, microscale manufacturing, and microscale heat transport. Topics will include a review of limits and assumptions of macroscale heat transfer, microscale energy transport mechanisms, microscale manufacturing techniques, thermal phenomena in semiconductor devices, micro heat pipes, micromanufactured thermal and mechanical sensors, and a brief introduction to nanomachines.

to:

(Prerequisite: Mechanical Engineering Major and Senior Standing)

This course will introduce emerging technologies and designs in individual or interdisciplinary areas of Mechanical Engineering. The topics can include but are not limited to microscale machinery and manufacturing, remotely operated vehicles (ROV), etc. The course will be integrated with hands-on research, design, build and test experience through a design project.

### **2. Rational**

#### A) Need for Change

1. Engineering is a fast-changing field, so this course is designed to permit the introduction of a variety of new and emerging topics to graduating mechanical engineering students. The topics of the course need to be updated to reflect the most advanced development in Mechanical Engineering, and therefore the previous focus on one specific emerging topic is not sufficient. The previously required prerequisite course needs to be broadened to reflect the need to have a range of prerequisite courses.
2. Due to the advanced content of the course, solid background of Mechanical Engineering is essential to understand the course material. This level of technical background can only be achieved after taking all the major core courses of

Mechanical Engineering in the sophomore and junior years, as well as the first-semester senior year.

#### B) Description of Curricular Effect

As a senior major course, "Emerging Topics in Mechanical Engineering" is a course to introduce the most updated developments in the field of Mechanical Engineering. Students should have finished all the fundamental courses in both stems of the discipline, namely Thermal and Fluid Sciences, and Mechanics/Mechanical Systems.