Class Meeting Times:  Lectures on Tuesday and Thursday (11:00 – 11:50) in EGR 1202

Lab Meeting Times by Section

<table>
<thead>
<tr>
<th>Section 0101</th>
<th>Lab</th>
<th>EGL 0105</th>
<th>Tuesday</th>
<th>12:00 – 1:50</th>
<th>Faculty: Dr. Azarm</th>
</tr>
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<tbody>
<tr>
<td>Section 0102</td>
<td>Lab</td>
<td>EGL 0105</td>
<td>Thursday</td>
<td>12:00 – 1:50</td>
<td>Faculty: Dr. Schmidt</td>
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<tr>
<td>Section 0103</td>
<td>Lab</td>
<td>EGL 0105</td>
<td>Wednesday</td>
<td>4:00 – 5:50</td>
<td>Faculty: Dr. Eslami</td>
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<tr>
<td>Section 0104</td>
<td>Lab</td>
<td>EGL 0105</td>
<td>Friday</td>
<td>1:00 – 2:50</td>
<td>Faculty: Dr. Vaughn-Cooke</td>
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<tr>
<td>Section 0106</td>
<td>Lab</td>
<td>EGL 0105</td>
<td>Tuesday</td>
<td>2:00 – 3:50</td>
<td>Faculty: Dr. Pertmer</td>
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Text:  

Introduction:  
The mechanical design process is the articulation of a physical artifact to satisfy a particular need. The product realization activities include determining customer (user) requirements and product characteristics necessary for satisfaction, quality, reliability, manufacturing methods and material selection, assembly, cost, environmental concerns, and safety regulations, and more. Successful product development requires formulating the design challenge correctly and generating an initial design specification before focusing on creating solutions. After the problem is defined, the method requires that possible solutions are first generated and then evaluated against a selection of quantifiable attributes based on the users' requirements and other criteria. The team selects from a set of candidate embodiments one that will best satisfy the objectives and constraints. Lastly, a detailed plan is developed that clearly shows how the design will be produced and how the methods chosen to produce it will insure a product that meets the users' requirements and makes a profit for the company. This requires continuous focus on the functionality and features that assure engineering performance and customer satisfaction.
Relationship of course to Program Outcomes:
This course satisfies the following individual learning outcomes promoted by the DRS Division.
1. The ability to recognize consistent principles and approaches across a variety of design tasks or embodied in a solution methodology.
2. The ability to think critically about the design process
3. The ability to apply engineering techniques, design and analysis methods and other product development tools in a team design project.
4. The ability to synthesize technical opinions and communicate them to colleagues in verbal and written form.
5. The ability to work in teams effectively.
6. Recognition of the contribution of engineering design to society and culture.
7. The recognition that engineers must maintain ethical and professional standards and an appreciation of these standards.

General Course Logistics:
ENME472 will be using the Canvas course environment. Students can login to their course(s) by going to elms.umd.edu. A University ID and password is required to access Canvas. Information on changing or resetting your University ID is available from https://ldap.umd.edu/cgi-bin/chpwd. Canvas offers many choices for notification about course activities. It is each student’s responsibility to set their communication preferences for their Canvas accounts. Information posted on Canvas will govern course operation.

Student Project Team Logistics:
Students in the course will form teams and select a design challenge of their choosing (subject to instructor’s approval) and employ the product development process (PDP) to design a product to meet the challenge. A series of required interim project reports and presentations are scheduled to assure timely team progress and emphasize effective team understanding and execution of the design process. Each student will be required to assess contributions of each team member (including themselves) after submission of each project report. Assignment and project details are available on the course website.

Course Objectives

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<tr>
<th>Course Objective</th>
<th>Assessment Method</th>
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| To experience many aspects of the design process and demonstrate competence in the skills required to participate successfully in this team process. | • Interim Project Reports  
• Team Design Work  
• Self and Peer evaluations |
| To develop a comprehensive understanding of how to use the design and analysis methods and tools acquired throughout the Mechanical Engineering curriculum (e.g., CAD drawing, costing, manufacturing knowledge). | • Individual Homework Assignments  
• Interim Project reports |
| To produce a working, functional prototype of the product’s key mechanical system(s) and demonstrate how it satisfies all aspects of functionality while meeting identified customer requirements. | • First Prototype  
• Final Prototype and Project Presentation on Design Day |
| To produce a complete description of the final design project, including detailed analysis and plans for production of CTQ systems; an estimate of the life cycle cost; and set of engineering drawings. | • Interim Project Reports  
• Final Project Report |
| To record details of the reasoning applied to arrive at the final product in sufficient detail so that a subsequent team could continue the process. | |
| To refine personal design philosophy, including preferences in technical, social, and ethical matters) to guide future practice. | • Individual Homework Assignments  
• Self and Peer evaluations |
ENME 472 Integrated Product and Process Development  
Fall 2016 Syllabus

Grading Policy:

It is the policy of the course instructors to apply the same performance expectations to all course participants regardless of their academic, employment, or linguistic background. Student grades will be assessed as follows:

- **Individual Effort (40% of Course Grade):**
  - 15% 4 individual and one team Homework Assignments
  - 5% Lecture Participation (via Clicker technology and handouts)
  - 20% Individual Contribution to Team Performance
    - Peer Evaluation 1: 3%
    - Peer Evaluation 2: 7%
    - Peer Evaluation 3: 10%

- **Team Effort (60% of Course Grade)**
  - 7.5% Interim Project Report 1
  - 5% Prototype 1
  - 10% Interim Project Report 2
  - 12.5% Refereed Poster and Prototype Presentation (Design Day)
  - 25% Final Project Report

**NOTE ON HOMEWORK AND PEER EVALUATIONS:** Assignments that are submitted between 1 minute and 24 hours late will receive 75% of the credit. Assignments that are more than 24 hours late will receive 0% of the credit. Exceptions will be made in accordance with University policy regarding these major grading events. It is the student’s responsibility to ensure that uploads to Canvas have been successfully submitted.

Attendance Policy:

Regular attendance (at lectures, at lab periods, and at established team meeting times) is expected. Each student is responsible for inquiring about and obtaining course material delivered in their absence (from course colleagues).

University policy (link below) excuses the absences of students for illness (self or dependent), religious observances, participation in University activities at the request of University authorities, and compelling circumstances beyond the student’s control. Students must submit the request in writing and supply appropriate documentation, e.g. medical documentation. Students with written, excused absences are entitled to a makeup exam (or assignments if applicable) at a time mutually convenient for the instructor and student.

**Academic Integrity and Academic Dishonesty:**

Please review the University policy on academic integrity and academic dishonesty (link below). Also note that no form of plagiarism will be tolerated. All work presented to the instructor is assumed to be the original work of the course participant(s). Words, diagrams, figures, or original contributions of anyone other than a student must be referenced when included in a student’s work. The course instructor may use plagiarism checking software and/or request evidence of references for any submitted work. A useful website on avoiding plagiarism is found at the Purdue Online Writing Lab (http://owl.english.purdue.edu/owl/resource/589/01/).

**Note:** All homework assignments are assumed to be original work of each individual course participant. Copying work done by another is considered an act of academic dishonesty and will be reported according to University policy. All other assignments are collaborative, group work. It is critical that teams use formal referencing practices in all reports and presentations. Failure to do so will be treated in accordance with University policy.

**University wide Honor Code:**

The University of Maryland has a nationally recognized Code of Academic Integrity, administered by the Student Honor Council (link below). This Code sets standards for academic integrity at Maryland for all undergraduate and graduate students. As a student you are responsible for upholding these standards for this course. It is very important for you to be aware of the consequences of cheating, fabrication, facilitation, and plagiarism.

To further exhibit your commitment to academic integrity, remember to sign the Honor Pledge on all examinations and assignments: "I pledge on my honor that I have not given or received any unauthorized assistance on this examination (assignment)."
University Course Related Policies
For further details on course related policies mentioned above, as specified by the University, go to http://www.ugst.umd.edu/courserelatedpolicies.html

Online Course Evaluation
Students can go directly to the website (www.courseevalum.umd.edu) to complete their evaluations. They will be alerted via their official University e-mail account about the dates of the evaluation period and provided more information closer to that time. Students who complete evaluations for all of their courses in the previous semester (excluding summer), can access the posted results via Testudo's CourseEvalUM Reporting link for any course on campus that has at least a 70% response rate.

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<tr>
<th>Course Lecture Schedule</th>
<th>Individual Assignments and Due Dates can be found online</th>
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<tbody>
<tr>
<td><strong>Week</strong></td>
<td><strong>Lecture Topics</strong></td>
</tr>
<tr>
<td>1</td>
<td>Aug. 30: Introduction to Course-Expectations and projects (GP) Sept. 1: Engineering Design and PDP (LS)</td>
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<tr>
<td>2</td>
<td>Sept. 6: Market Analysis and Problem Identification (M. Fuge) Sept. 8: Setting Design Parameters &amp; PDS (LS)</td>
</tr>
<tr>
<td>3</td>
<td>Sept. 13: Concept Generation I (LS) Sept. 15: Concept Generation II (LS)</td>
</tr>
<tr>
<td>10</td>
<td>Nov. 1: DFM, DFA and DFX (GP) Nov. 3: Introduction to Product and System Cost Analysis (GP)</td>
</tr>
<tr>
<td>11</td>
<td>Nov. 8: Intellectual Property (F. Metz - OTC) Nov. 10: Reliability Engineering for Product Design (GP)</td>
</tr>
<tr>
<td>13</td>
<td>Nov. 22: Ethics (R. Sochol) Nov. 24: THANKSGIVING</td>
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1 Individual lecture topics and orderings are subject to change
Due Dates

Homework
- HMWK 1: Team Experiences  Friday, 2 September by 5 pm (Canvas submission)
- HMWK 2: Team Contract Monday, 12 September by 5 pm (Canvas submission)
- HMWK 3: Patent Search Friday, 16 September by 5 pm (Canvas submission)
- HMWK 4: Concepts Friday, 23 September by 5 pm (Canvas submission)
- HMWK 5: Ethics Essay Thursday, 1 December by 5 pm (Canvas submission)

List of 4 project topics (ranked)
with brief description of each Week of 5 September
Due by 5 pm (Canvas submission) the day before lab session

Reports
- Interim Report 1 Thursday, 6 October by 9 am (Canvas submission)
  Hard copy due in lecture
- Interim Report 2 Thursday, 10 November by 9 am (Canvas submission)
  Hard copy due in lecture
- Final Report Thursday, 8 December by 9 am (Canvas submission)
  Hard copy due in lecture

Peer Evaluations
- Peer Evaluation 1 Thursday, 6 October by 5 pm
- Peer Evaluation 2 Thursday, 10 November by 5 pm
- Peer Evaluation 3 Thursday, 8 December by 5 pm

Prototype 1 Week of 1 November in lab session

Complete Digital Poster Friday, 9 December by 5 pm