MEEG 304 – Mechanical Design Elements  
Department of Mechanical Engineering  
University of Delaware – Spring 2014

Instructor  
Dr. James Glancey, P.E.  
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Office hours: TR 4 to 5p.

Teaching  
Graduate TA: Sushant Veer, veer@udel.edu. Office hours: TBD.  
Undergraduate TAs:  
Emily Pierce, empierce@udel.edu. Office hours: TBD.  
Christine Wilkerson, wilkchr@udel.edu. Office hours: TBD.

Course Website  
http://sakai.udel.edu

Class Time  
TR, 5:00-6:15 AM  
Brown Lab, room 101

Text  
Shigley’s Mechanical Engineering Design, 9th Edition  
Authors: Budynas & Nisbett, ISBN- 0073121932

Description  
This course presents basic tools, elements and approaches to mechanical systems design. Thematically, instruction will cover 1) Mechanics and Failure of Materials, 2) Design and Analysis of Machine Elements and Mechanical Assemblies. The students will have opportunities to apply the course content to general engineering analysis problems and open-ended design challenges.

Content  

<table>
<thead>
<tr>
<th>Topics Covered</th>
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<tbody>
<tr>
<td>Relating external loads to stresses</td>
</tr>
<tr>
<td>Elastic deformation</td>
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<tr>
<td>Static Failure Theories</td>
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<tr>
<td>Dynamic failure</td>
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<tr>
<td>Elements of Machine Design</td>
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<td>Systems Design and Analysis for a Customer</td>
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**Outcomes**

By the end of the course, each student will have demonstrated abilities to:

- Define (mechanical) failure,
- Select and apply an appropriate failure model,
- Select and design an appropriate machine element
- Determine allowable load (under the given operating conditions)
- Determine element life,
- Design and analyze assemblies and subassemblies of multiple elements
- Function within an interdisciplinary team to complete large projects
- Communicate effectively
- Use engineering tools appropriately
- Understand and apply the ethical responsibilities of design engineering.

**Grading & Assignments**

<table>
<thead>
<tr>
<th>Assignments</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Homework Assignments</td>
<td>35%</td>
</tr>
<tr>
<td>First Exam</td>
<td>15%</td>
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<tr>
<td>Second Exam</td>
<td>20%</td>
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<tr>
<td>Team Design Project</td>
<td>30%</td>
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All graded team assignments will include a peer evaluation using the CATME system that will be used to convert team grades to individual grades.

Late assignments – both individual and team - will be accepted with a 50% penalty. Assignments will no longer be accepted 2 days after the due date.

All individual assignments are due by 4:00 pm Friday in the mailbox of the grading TA.

The second exam will be given on the last day of class. The final exam period will be used for the final design project presentations.

All written and oral communication assignments will follow the GACTI guidelines. Assignments that do not reflect the GACTI guidelines may be returned for revision prior to grading with penalty.

Note that the grade you receive on Quiz 0 will add up to 10 points onto your Exam 2 grade assuming you get at least a grade of 60 on Quiz 2.

Attendance is required for all classes and will be taken randomly during the semester. For every 2 unexcused absences, your final grade will be reduced by one-half letter grade.

If anyone requires special accommodations for exams, please contact the UD office of the ADA: 831-4643.

**ABET**

ABET accreditation requires the effective demonstration of 3 outcomes by every student in the class. The outcomes are: 1) the ability to work as part of an
interdisciplinary team (peer evaluations); 2) effective use of engineering tools (assn. 2); 3) the ability to effectively communicate (assn. 1). The peer evaluation scores are to be taken very seriously. Peer evaluations must be justified and honest; any attempts to unfairly influence the outcomes of these evaluations will become matters for the Office of Judicial Affairs. Failure to demonstrate a passing score on any of the three outcomes will result in a failing grade regardless of the course score. Only scores of greater than 65% are sufficient to pass the assignments used to assess these outcomes. Another ABET outcome will be the understanding of ethical responsibilities of design engineers.

**Honesty**

All students must be honest and forthright in their academic studies. To falsify the results of one’s research, to steal the words or ideas of another, to cheat on an assignment, or to allow or assist another to commit these acts corrupts the educational process. Students are expected to do their own work and neither give nor receive unauthorized assistance. Any evidence of a potential honesty violation will be immediately handed over to the Office of Judicial Affairs.