UNIVERSITY OF NORTH TEXAS
Department of Mechanical and Energy Engineering
MEEN 4250 – Mechanical and Energy Engineering Systems Design II     Spring 2017

Instructor: Dr. Mark Wasikowski (mark.wasikowski@unt.edu)
Sections: No lecture.
Office and Hours: F101L. TR afternoons. Anytime I am here and door is open. I am here to help you.
Teaching Assistant: Anton Yorzh

Class Schedule:
Sa 8:00 – 11:20 AM and 1:00 – 4:20 PM, Room: NTDP F175
Class will only meet on Saturday’s when specified. Lab attendance at the assigned section time is not required. The lab sections merely provide groups with a common meeting time and facilities that might be needed for project completion. Teams are free to meet outside of these scheduled times if desired. Teams must meet as a group and accomplish the team’s goals together. ALL STUDENTS MUST HAVE UNIVERSITY EMAIL THROUGH BB AND CHECK EMAIL FREQUENTLY. SINCE NO REGULAR LECTURE, EMAIL COMMUNICATION IS ESSENTIAL.

Textbooks:
No textbook is required for course. The needed course material will be presented through handouts and presentations in class. The following books are recommended as references:

Catalog Course Description:
This Capstone core course in Mechanical and Energy Engineering (MEE) is the culminating experience of the Bachelor of Science degree in MEE, and it is a direct continuation of MEEN 4150, MEE Design I. Student teams complete product design, development, and manufacturing projects conceived to promote the common good of society. The course is patterned on a professional work place environment that allows students to make connections between different areas of knowledge. Students will learn decision making strategies that include ethical analysis by planning and managing resources while adhering to an overall project schedule. As a major learning outcome to this capstone course, students will be able to express ways that exposure to different areas, perspectives and viewpoints enriches their thinking. This class is required for the B.S. degree in mechanical and energy engineering at UNT.

Prerequisite: MEEN 4150 (with a grade of C or better)

Course Topics:
- Teamwork
- Engineering Design
- Project Management
- Communication
- Safety and Ethics

Student Learning Objectives:
This class will address the following outcomes:
  a. Gain experience working in teams.
  b. Apply engineering knowledge to design and construct a solution to a real world problem.
  c. Detail design using modern engineering software toolsets.
  d. Enhance technical communication skills through written reports and presentations.
ABET Criteria:
MEEN 4250 addresses the following ABET program outcomes:

a) Apply knowledge of mathematics, engineering and science
b) Design and conduct experiments to verify and validate the design projects they develop and analyze and interpret data
c) Develop project-based learning skills through design and implementation of a system, component or process that meets the needs within realistic constraints
d) Function in multi-disciplinary teams
e) Identify, formulate and solve engineering problems
f) Have an understanding of professional and ethical responsibility
g) Communicate effectively
h) Achieve broad education necessary to understand the impact of mechanical and energy engineering solutions in a global and societal context
i) Understand learning processes and need for learning
j) Achieve knowledge of contemporary issues
k) Use techniques, skills and computer-based tools for conducting experiments and carrying out designs
l) Apply principles of engineering, basic science and mathematics to model, analyze, design and realize physical systems, components or processes in both thermal and mechanical systems areas.

Course Evaluation:
Students function on teams. Therefore, attendance and participation is mandatory and is specifically graded. A team cannot succeed if a team member is absent. PER UNIVERSITY POLICY, A STUDENT WILL BE DROPPED FROM THE COURSE WITH A WF (WITHDRAW FAILING) GRADE FOR NON ATTENDANCE, REGARDLESS OF CURRENT GRADE AT THE TIME. Each team is assigned a faculty adviser and works with the adviser each week to measure progress. The goal for this course is to bring designs to completion. As this is a team-based course, each student’s final grade will have a team-based component, as well as an individual-based component. The team-based score components are derived from weekly assignments/deliverables that should be prepared as a team. All members of the team will receive the same team-based score unless there is evidence of non-participation of a team member. Individual-based score components are generated from weekly progress reports and peer evaluations.

Assignments:
Assignments will be given to monitor each team’s progress in the build and test process. Assignments will consist of weekly written reports, group presentations and a final comprehensive written report. Assignments will be evaluated by the instructor and teaching assistants. In case of a dispute on grading, the faculty advisor will be consulted and the two grades will be averaged to determine your final assignment grade. It should be noted that each team member is required to participate equally in the group assignments and presentations. Each student will be evaluated on their participation by their team members and faculty advisors.

Peer Review:
Each student will complete two reviews of each of their teammates – one at the beginning of the term and one at the end of the term. The peer review form is included with the syllabus. The form should be copied, one for each review. Students turn this form in directly to the instructor. No one else will see the form. The peer review will be used by instructor to update average grades and provide anonymous coaching to the team.

Field Trip:
Each team must complete a field trip. All team members are required to attend, or no one receives any credit. The team must plan and execute a team building service project. The purpose of the project is to learn about service to others through charitable giving, while also learning about other team member’s interests outside of school. Team performance can be affected by how well team members appreciate one another. Family members and significant others also welcome to attend. The field trip must be a minimum 4 hour service project that directly benefits any charitable, non-profit, or religious organization or cause – but not UNT directly. Please approve the topic in advance with the instructor. Each student submits their own trip report.
**Project Plan:**
Each team will create a project plan that meets all deliverables items on schedule. Given the high level schedule provided in this syllabus, each team creates a team schedule. The team schedule must list all high level requirements given in the syllabus and how each is going to be accomplished. Then, the assignments for each team member are given that supports the project milestones. All students must share equally in the work effort and have the opportunity to learn and practice the required engineering skills — operating CAD to create a part drawing (with dimensions), an assembly drawings with manufacturing notes, and run a computerized solid model to perform engineering analysis. If a team is currently holding an “I”, or an incomplete BOM, then time must be allotted in the plan without changing the overall milestone schedule.

**Progress reports:**
Progress reports will be required from every student once teams are selected. Due dates are shown below and a template for the progress report will be provided on Blackboard. Class attendance / participation will be part of your individual grade. A sign-in sheet track attendance. Please be sure to sign the attendance sheet each week to get credit. The attendance sheet may be taken up after the first 15 minutes of class, so if you are late you may not be allowed to get credit for attending. Students are responsible for signing the attendance sheet. Clean up of your lab workspace will also be included in your final grade. Work space must be clean and tools put away. Fabrication is preferred to be performed at DP, rather than a student(s) garage. Also, all project materials, assemblies, etc. must be dispositioned in terms of keep, discard, etc. or kept by the team and faculty advisor. Weekly conferences with instructor or faculty advisor required to help each team with issues that are peculiar to each team. All team members should be present for conference. Teams can make an appointment to meet instructor/faculty advisor in person at a mutually agreed time and location. For meetings with faculty advisor or sponsor, notes/action items are to be taken and provided to instructor. A grade will be given for progress made by team and team members. Points will be deducted for missing team members without an approved excuse, so be sure to schedule when everyone can be present and participate.

**Posters and Brochures**
Poster and the 1 paragraph write-up + Image/s is due April 11th. Each team will create will follow the poster and brochure guidelines outlined at: [http://engineering.unt.edu/mechanicalandenergy/poster-resources](http://engineering.unt.edu/mechanicalandenergy/poster-resources)

**Design Day:**
Final project will be presented Friday, April 28th. Each team given a table / location to show your work. One page brochure prepared showing summary of work performed. Each team will provide a poster that will display nature of project performed (see MEEN hallway for examples and template provided). Final presentations of projects made to MEEN faculty/staff / students and industry advisory board members.

**Assignments at a Glance**

<table>
<thead>
<tr>
<th>Assignments</th>
<th>Team</th>
<th>Individual</th>
<th>Due Date</th>
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<tbody>
<tr>
<td>Individual Peer Review 1</td>
<td></td>
<td>X</td>
<td>24 Jan</td>
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<tr>
<td>Project Plan</td>
<td>X</td>
<td></td>
<td>27 Jan</td>
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<tr>
<td>Instructor Team Conference to Review Project Plan</td>
<td></td>
<td>X</td>
<td>27 Jan</td>
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<tr>
<td>Individual Progress Reports - February</td>
<td>X</td>
<td>x</td>
<td>3,10,17,24 Feb</td>
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<tr>
<td>Team Building Service Project Field Trip Report</td>
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<td>x</td>
<td>13 Feb</td>
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<td>Team Conference with Instructor</td>
<td>X</td>
<td></td>
<td>NLT 9 March</td>
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<tr>
<td>Individual Progress Reports - March</td>
<td></td>
<td>X</td>
<td>3,10,24,31 March</td>
</tr>
<tr>
<td>Individual Progress Reports - April</td>
<td>X</td>
<td></td>
<td>7,14,21 April</td>
</tr>
<tr>
<td>Draft Poster to Erin Allice for Printing</td>
<td>X</td>
<td></td>
<td>7 April</td>
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<tr>
<td>Final Poster to Erin Allice for Printing</td>
<td>X</td>
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<td>11 April</td>
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<tr>
<td>Individual Peer Review 2</td>
<td></td>
<td>X</td>
<td>21 April</td>
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<tr>
<td>Design Day – Poster, Brochure and Final Presentation</td>
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<td>X</td>
<td>28 April</td>
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<tr>
<td>Final Report</td>
<td>X</td>
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<td>4 May</td>
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**Grade:** standard 90/80/70/60.

**Team Assessment:** (45%)
- Project Plan 5%
- Overall Design / Project Quality 10%
- Team Brochure and Poster 5%
- Design Day Final Presentation 15%
- Final Report 10%

**Individual Assessment:** (55%)
- Team Building Field Trip 5%
- CAD Drawings 10%
- Solid Modeling Detailed Design Analysis 10%
- Team Conference with Instructor (midterm) 10%
- Individual Weekly Progress Reports 15%
- Peer Evaluations 1 5%
- Peer Evaluations 2 5%

**Class Attendance / Participation** P/F

**Disability Policy:**
All reasonable accommodation will be made to facilitate special needs. If special accommodations are required, the student must first meet with the staff of the Office of Disability Accommodation (ODA), Union Suite 322, (940) 565-4323. After meeting with that office, please contact me to discuss what accommodations will be necessary. For more information, see [http://www.unt.edu/oda](http://www.unt.edu/oda)

**Class Policies:**
Class assignments are required to be turned in to instructor in paper form, unless otherwise instructed. Emails will not be accepted except when specifically permitted by the assignment. Late submissions after the due date, but before the next class date have the grade for that assignment reduced by 50%. Late submissions after the next class date (following week) will not be accepted and the student will receive a zero for that assignment. Excusable absences are accepted only if the student informs the professor before the event such as illness and non-reschedulable prior appointments, or after the event, such as medical or other emergencies, within a reasonable time frame. In all cases, academic honesty is expected.

**Dishonesty:**
Any form of dishonesty during the semester will result in a final grade of F for the course and a recommendation for expulsion to the Provost. No exceptions. Please avoid cheating or any other form of misconduct. If you are having personal problems, come and talk to the instructor.

**Characteristics/Expectations of “A” Students:**
- assignments, action items, deliverables are high quality, completed on time and in format requested
- Attends asks questions. participates with enthusiasm
- Team, sponsor and faculty advisor meetings are attended and prepared for
- Communicate effectively with team members, instructor, faculty and others throughout semester.
- Take initiative to learn from others outside of class utilizing their knowledge to further project
- Student values different perspectives in team members and works to create consensus/decisions
- Student is self-motivated and accomplishes tasks without prodding from others.
INDIVIDUAL PEER REVIEW
(Submit 1 review for each team member)

Reviewer Name: ___________________________________

Team Member Being Reviewed: ___________________________________

How well did your team member accomplish goals agreed to in team contract? Under grade column, please provide a grade per schedule, plus comment:
   A: Exceptional
   B: above average
   C: average
   D: poor
   F: unacceptable

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<tr>
<th>Expectations</th>
<th>Grade</th>
<th>Comments</th>
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<tbody>
<tr>
<td>Strive to complete all assigned tasks before or by deadlines</td>
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<td>Complete all tasks to the best of ability</td>
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<td>Listen carefully and attentively to all comments at meetings</td>
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<td>Accept and give criticism in a professional manner</td>
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<td>Focus on results before the fact, rather than excuses after</td>
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<td>Provide as much notice as possible of commitment problems</td>
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<td>Attend and participate in all scheduled group meetings</td>
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Team member strength:

Team member weaknesses:

Other comments:
SERVICE PROJECT TRIP REPORT

Student Name: ___________________________________

Service Project Beneficiary or Activity: ____________________________________

How did attending help you learn about the value of serving others with any expectation of anything in return?

How did attending help your team members?

How is serving others also like serving your team?

For each of your team members (list by name), answer the following questions. Additional sheets can be added for each team member to provide sufficient space to answer the questions.

List 3 things that you learned about your team member that you did not already know.

Would your team member be a good leader? Why or why not?

Has your team member typically been self-focused? Are their actions centered on helping themselves, or others?