

UNIVERSITY OF NORTH TEXAS

Department of Mechanical and Energy Engineering

MEEN 4150 – Mechanical and Energy Engineering Systems Design I Fall 2016

Instructor: Mark Wasikowski: (940) 369-8030 mark.wasikowski@unt.edu

Office Hours: F101L MW TBD or by appointment

Schedule: TTH 10:00 – 11:20 AM, Room: NTDP B185, Lab F102D

Class and labs will share the assigned lecture and lab times. Lab attendance is mandatory, but meeting times may vary from your registration. The lab sections provide groups with a common meeting time and facilities needed for project completion. Teams are free to also meet outside of these scheduled times if desired.

Textbooks: None. Course material presented through handouts / presentations. Recommended books:

Product Design and Development, 5th Edition, McGraw Hill, 2012

Karl T. Ulrich, Steven D. Eppinger

ISBN: 978-0-07-340477-6

Engineering Design, Planning, and Management, Academic Press, 2013

Hugh Jack

ISBN: 978-0-12-397158-6

Catalog Course Description: Advanced treatment of engineering design principles with an emphasis on product and systems design, development and manufacture. Mimics “real world” environment with students working in teams to prepare product specification, develop several concepts, perform detailed design, and construct prototypes subject to engineering, performance and economic constraints.

Course Topics:

- Teamwork
- Engineering Design
- Project Management
- Communication
- Public Speaking skills
- Safety
- Ethics

Prerequisite(s): must NOT be pre-engineering major and must pass:

- EENG 2405 or 2610: Circuit Analysis
- MEEN 3100 Manufacturing (Co-requisite)
- MEEN 3130 Machine Element Design
- MEEN 3210 Heat Transfer
- MEEN 3230 System Dynamics and Control

Student Learning Objectives:

This class will address the following outcomes:

- a. Formulate a design problem, conduct relevant research, and develop feasible solutions
- b. Develop project management skills: task assignment, cost analysis, purchasing/budgeting, scheduling, time management
- c. Carry out component-level design and incorporate it into the system-level design
- d. Teamwork
- e. Oral and written communication of the preliminary and final results

Course Evaluation:

Students will work in teams. Each team selects a design project with help of an advising faculty member. Our goal is to perform a project preliminary / detail design. Preliminary designs will be brought to completion in MEEN 4250 Design II. 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. The individual-based score components are generated from weekly progress reports, peer evaluations and other assignments.

ABET Criteria:

MEEN 4150 addresses 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.

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

Weekly Progress Reports will be required from every student once teams are selected. Due dates will be announced in advance and a template for progress reports will be provided on Blackboard. Class attendance / participation **will** be part of your individual grade. Each group will be required to submit **a binder** at the end of the semester. The binder should contain meeting minutes (template provided), team member research notes, and copies of weekly assignments. All paperwork associated with project should go in binder.

Grade Evaluation:

Team Assessment:	
Weekly Assignments	15%
Binder	5%
Conceptual Design Presentation	10%
Preliminary Design Presentation	10%
Final Presentation	10%
Final Report	10%

Grade Scale Interpretation:

A – 90-100 %
B – 80-89 %
C – 70-79 %
D – 60-69 %
F - < 60 %

Individual Assessment:

Peer Evaluations	10%
Faculty Advisor/Instructor/Sponsor Evaluations	10%
Individual Assignments/Progress Reports	10%
Class Attendance/ Participation	10%

Disclaimer: The course schedule, content and assignments are subject to modification when required as the course progresses. If a change will be made, students will be notified ahead of time.

Communication: Your official **UNT email** should be used for this course. Faculty and industry sponsors will contact you via the UNT email system. You must make sure to check your UNT account to make sure you receive all the course information. Blackboard will also be used in this class. Assignments, templates, etc. will be posted online for your convenience.

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>

Class Policies: Class assignments are required to be turned in to instructor in paper form. 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. You will very shortly become a practicing professional engineer. Appropriate behavior is expected. If you are having personal problems, come and talk to the instructor.

Characteristics/Expectations of A Students:

- Assignments, action items and deliverables are high quality, on time and in format requested.
- Student attends class, asks questions and participates with enthusiasm.
- Team, sponsor and faculty advisor meetings are attended and prepared for.
- Student communicates effectively with team members, instructor, faculty advisor and others throughout semester.
- Student takes initiative to learn from others outside of class utilizing their knowledge to further project (i.e. contacting industry people with pertinent experience to learn from).
- Student values different perspectives in team members and works to create consensus/decisions.
- Student is self-motivated and accomplishes tasks without prodding from others.