MEEN 4370 Capstone Projects
Mechanical Engineering, School of Engineering and Computing Sciences
Spring 2015

A. COURSE INFORMATION

Course number/section: MEEN 4370.001/4370.201
Class meeting time: Lec: F 12:00-12:50 p.m.; Lab: MW 12:00-1:50, F 1:00-1:50 p.m.
Class location: Lec: CS 111; Lab: EN 111
Course Website: bb9.tamucc.edu

B. INSTRUCTOR INFORMATION

Instructor: Dr. Ruby Mehrubeoglu
Office location: EN 222B
Office hours: MW 9:30-11:00 a.m., F 10:00-12:00, and by appointment
Telephone: 361-825-3378
e-mail: Ruby.Mehrubeoglu@tamucc.edu
Appointments: E-mail or call to make an appointment

C. COURSE DESCRIPTION

Catalog Course Description
This course allows students to employ the knowledge attained in other courses to implement
(including building, testing, and documenting) an approved project, within budget and on
schedule. Course requirements include a written report and oral presentations.

Extended Course Description
This course is about the realization of an engineering design through developing experiments to
test, improve, and validate a final working prototype. The students work in teams and are
expected to demonstrate individual contribution to the project, both technical and non-technical.

D. PREREQUISITES AND COREQUISITES

Prerequisites
MEEN 4340 - Project Management

Corequisites
MEEN 4360 - Thermal Systems Design and MEEN 4365 - Mechanical Systems Design. To
be taken in the student’s final long semester before graduation.

E. REQUIRED TEXTBOOK(S), READINGS AND SUPPLIES

Required Textbook(s)
1. David F. Beer and David A. McMurray, A Guide to Writing as an Engineer, 3rd Edition,

Optional Textbook(s) or Other References


Supplies

To be determined individually for each team based on Bill of Materials

F. **STUDENT LEARNING OUTCOMES AND ASSESSMENT**

Assessment is a process used by instructors to help improve learning. Assessment is essential for effective learning because it provides feedback to both students and instructors. A critical step in this process is making clear the course’s student learning outcomes that describe what students are expected to learn to be successful in the course. The student learning outcomes for this course are listed below. By collecting data and sharing it with students on how well they are accomplishing these learning outcomes students can more efficiently and effectively focus their learning efforts. This information can also help instructors identify challenging areas for students and adjust their teaching approach to facilitate learning.

By the end of this course, students should be able to:

1. Keep real-time documentation of project’s progress and results (including research, testing, troubleshooting, analysis results, charts, diagrams, design sketches, etc.) in a notebook
2. Create and present capstone project status reports
3. Analyze/justify/demonstrate the project design, performance and needed improvements, using modern engineering tools, software, and theoretical formulas
4. Design, develop and create a prototype of proposed capstone project (through integration of knowledge, concepts, and skills in engineering)
5. Practice professional skills (team, time, budget management, leadership, conflict resolution, etc.), to complete the capstone project
6. Create and apply testing schemes to validate the product performance, and troubleshoot technical problems
7. Develop a patent application for the proposed product
8. Analyze the social and global impacts and ethical implications of the project
9. Revise engineering concepts in the context of FE exam
G. INSTRUCTIONAL METHODS AND ACTIVITIES

Methods and activities for instruction include the following: lectures, meetings, invited speakers, group discussions, webinars, team assignments, homework assignments, quizzes, reports, oral presentation, and a technical notebook.

H. MAJOR COURSE REQUIREMENTS AND GRADING

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>% of FINAL GRADE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weekly Advisor Meeting (summaries and in-class updates)</td>
<td>10</td>
</tr>
<tr>
<td>Notebooks</td>
<td>5</td>
</tr>
<tr>
<td>Team and Mentor Assessments</td>
<td>5</td>
</tr>
<tr>
<td>Homework + Pop Quizzes</td>
<td>15</td>
</tr>
<tr>
<td>Capstone Project Proposal and Oral Presentation</td>
<td>10</td>
</tr>
<tr>
<td>CP Progress Report and Oral Presentation</td>
<td>20</td>
</tr>
<tr>
<td>Final Project Defense and Report</td>
<td>35</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td><strong>100</strong></td>
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</tbody>
</table>
# I. COURSE CONTENT/SCHEDULE

## COURSE OUTLINE: Weekly Schedule*

<table>
<thead>
<tr>
<th>WEEK</th>
<th>Date</th>
<th>Reading</th>
<th>Lecture Topics*</th>
<th>Laboratory Topics and Assignments* (*Subject to change)</th>
</tr>
</thead>
</table>
| 1    | 01/21-01/23| Appendix A, B (MS OP)    | Review of syllabus; Review of safety and security procedures; Lab notebooks | **Lab Safety; Workshop Tour**  
- Gantt chart, network diagram and calendar view of the proposed capstone project plan (UPDATED PLAN from last semester showing the phases of the project lifecycle)  
- Assignment: Set up weekly appointments with capstone project advisor (SLO 2) |
| 2    | 01/26-01/30| Review of Ch 12 (MS OP)  | Student updates on projects  
- resource allocation  
- schedule  
- budget  
Bill of Materials  
Identifying vendors for materials purchase | **Assignment: Coastal Bend Business Plan Competition (business plan*)**  
**Assignment: Measuring Performance with Earned Value Analysis (SLO 3)**  
**WEEKLY ASSIGNMENT:**  
- a) Weekly advisor-approved advisor meeting summaries  
- b) Notebook reviews by instructor (SLO 1)  
- Project Phase: Updated CAD/circuit drawings (detailed blue print), and theoretical analysis of performance |
| 3    | 02/02-02/06| Review of Ch 13, 14 (MS OP), Ch 3,5 (GWE) | **Guest Lecturer – PMI**  
Technical Writing; Social and economic impact of the project; | **Capstone Project Proposal – Oral Presentation and Report (video recording) (SLO 2,3,6,8)**  
**Final DESIGN, RESOURCES and BUDGET due**  
**WEEKLY ASSIGNMENT:** (see above) |
| 4    | 02/09-02/13| Ch 22 (MS OP), Ch 5,6,9 (GWE) | Engineering Ethics and Ethics Writing | **Managing Risks, Issues and documentation**  
**WEEKLY ASSIGNMENT:** (see above)  
**Project Phase: Complete the acquisition of materials for the CP**  
**Review of video recordings (SLO 2)** |
| 5    | 02/16-02/20| Ch 7,8 (GWE)             | Engineering Economics; Review of Engineering Concepts | **Tracking work and updating capstone project plan**  
**Project Phase: Building**  
**WEEKLY ASSIGNMENT:** (see above) |
| 6    | 02/23-02/27| Ch 10 (GWE)              | Review of Engineering Concepts | **Project Phase: Building**  
**HW Assignment: Provisional Patent Application (SLO 7)**  
**WEEKLY ASSIGNMENT:** (see above) |
| 7    | 03/02-03/06| Ch 11 (GWE)              | Review of Engineering Concepts | **Project Phase: Implementation**  
**WEEKLY ASSIGNMENT:** (see above) |
| 8    | 03/09-03/13| Ch 11 (GWE)              | Review of Engineering Concepts | **Project Phase: Implementation**  
**CP Progress Report – Oral Presentation and Report (video recording) (SLO 2,3,4,6,8)** |
| 9    | 03/16-03/20| SPRING BREAK             |                                                     |                                                                                                                      |
J. COURSE POLICIES

Attendance/Tardiness
You are advised to attend all lectures and laboratories. If you miss a class period, you are responsible for whatever is covered or announced during your absence. There will be no make-ups for oral presentations or quizzes. The students are expected to display responsible conduct in the classroom and laboratory, including but not limited to adhering to the rules and regulations, and respecting the instructor and fellow classmates.

Late Work and Make-up Exams
No makeup examinations will be given except in the case of a documented extreme emergency, or University-accepted excuse. Makeup exams will be different from the regular exams and more challenging.

All assignments, both individual and team, must be uploaded by each student to Black Board online system as well as hard copies handed to the course professor in class by the due dates. Late assignments will only be accepted with penalty and with prior notification. There will be a 20 point deduction per late day from the total score of maximum 100 up to 5 days, after which a late assignment will not be accepted. Late assignments will not be accepted after the
graded assignments are returned to class.

**Extra Credit**
Extra credit may be assigned at the discretion of the instructor.

**Food in Class**
Eating or drinking is strictly prohibited in the labs, and not permitted in the lecture rooms. Students with food or drink in visible sight will be asked to discard them, or leave the room. All signage regarding health and safety must be followed in the lecture rooms and laboratories.

**Missed Exam**
No makeup examinations will be given except in the case of a documented extreme emergency, or University-accepted excuse. Makeup exams will be different from the regular exams and more challenging.

**Participation**
Students are expected to participate in the in-class and online exercises, discussions, and team work.

**Use of Electronic Devices**
The use of cell phones, electronic devices, or computers for purposes other than those of the course objectives of the day is not permitted. Restricted activities include but are not limited to text messaging, twittering, talking on the phone, instramgramming, browsing on the internet, and disrupting the classroom activities. Anyone displaying unsuitable classroom behavior will be asked to leave the classroom or the laboratory. Recording of part or all of the lecture or lab instruction and materials requires approval of the course instructor.

**Safety**
The safety of students, faculty, staff and visitors to the engineering laboratories is of paramount importance to the Mechanical Engineering and Engineering Technology programs. You must follow all safety procedures and use personal protective equipment as required in each laboratory and workshop. Any student who attempts to use equipment without authorization or violates any safety policy or regulation will be immediately removed from the laboratory.

**K. COLLEGE AND UNIVERSITY POLICIES**

- **Academic Integrity (University)**
  It is expected that university students will demonstrate a high level of maturity, self-direction, and ability to manage their own affairs. Students are viewed as individuals who possess the qualities of worth, dignity, and the capacity for self-direction in personal behavior.
See Full University Policy at http://catalog.tamucc.edu/content.php?catoid=10&navoid=313#Academic_Integrity

- **Classroom/Professional Behavior**
  Please follow the student handbook and the course policies outlined above.

- **Deadline for Dropping a Course with a Grade of W (University)**
  The grade of W will be assigned to any student officially dropping a course by Friday, April 10, 2015. No student is eligible to receive a W without completing the official drop process by this deadline. Visit the Office of the University Registrar for the Course Drop Form that must submitted. After April 10, 2015 a student will not be allowed to drop a course.

- **Grade Appeals (College of Science and Engineering)**
  As stated in University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures, a student who believes that he or she has not been held to appropriate academic standards as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is upon the student to demonstrate the appropriateness of the appeal. A student with a complaint about a grade is encouraged to first discuss the matter with the instructor. For complete details, including the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, see University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules website at http://www.tamucc.edu/provost/university_rules/index.html, and the College of Science and Engineering Grade Appeals webpage at http://sci.tamucc.edu/students/GradeAppeal.html. For assistance and/or guidance in the grade appeal process, students may contact the chair or director of the appropriate department or school, the Office of the College of Science and Engineering Dean, or the Office of the Provost.

- **Disability Services**
  Disability Services (DS) is the hub for coordinating services and accommodations to ensure accessibility and utilization of all programs for all Texas A&M University-Corpus Christi students with disabilities. Our services are designed to meet the unique educational needs of enrolled students with documented permanent or temporary disabilities. DS provides intake and consultation services to students seeking to register with our office. DS reviews an individual’s documentation of disability and assesses eligibility for services and the determination of reasonable accommodations. For more information visit the Disability Services Office at 116 Corpus Christi Hall or go to http://disabilityservices.tamucc.edu/

**L. OTHER INFORMATION**
Students are expected to work in teams and contribute to teamwork equally. Engineering Technology students will be exposed to advanced topics related to project management, and will analyze case studies in the classroom.

GENERAL DISCLAIMER

The instructor reserves the right to modify the information, schedule, assignments, deadlines, and course policies in this syllabus if and when necessary. The instructor will announce such changes in a timely manner during regularly scheduled lecture periods.