MEEN 4370 Capstone Projects  
Mechanical Engineering, School of Engineering and Computing Sciences  
Spring 2017

A. COURSE INFORMATION

Course number/section: MEEN 4370.001/4370.201  
Class meeting time: Lec: F 1:00-1:50 p.m.; Lab: MW 1:00-2:50 p.m, F 2:00-2:50 p.m.  
Class location: Lecture EN 107; Labs: BH 205  
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 10:30-12:30  
Telephone: 361-825-3378  
e-mail: Ruby.MehrubeogluATtamuccDOTedu  
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. C. Chatfield and T. Johnson, *Microsoft® Office Project 2010 Step by Step*, Microsoft,  
2010. (ISBN 0735626952)
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. Develop a Business Plan based on the Capstone Project Prototype/Service

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>
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<tbody>
<tr>
<td>Weekly Advisor Meeting (summaries and in-class updates)</td>
<td>10</td>
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<tr>
<td>Project Notebooks</td>
<td>5</td>
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<tr>
<td>Team and Mentor Assessment</td>
<td>5</td>
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<tr>
<td>Homework + Pop Quizzes</td>
<td>15</td>
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<tr>
<td>Capstone Project Proposal and Oral Presentation</td>
<td>10</td>
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<tr>
<td>CP Progress Report and Oral Presentation</td>
<td>20</td>
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<tr>
<td>Final Project Defense and Report</td>
<td>35</td>
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<tr>
<td>TOTAL</td>
<td>100</td>
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I. COURSE CONTENT/SCHEDULE

<table>
<thead>
<tr>
<th>COURSE OUTLINE: Weekly Schedule*</th>
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<tbody>
<tr>
<td><strong>WEEK</strong></td>
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<tr>
<td>1</td>
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<td>4</td>
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<tr>
<td>WEEK</td>
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| 5    | 2/13       | Engineering Economics; Planned Value, Earned Value, Actual Cost review / project updates | • Tracking work and updating capstone project plan  
• Project Phase: Building  
• **WEEKLY ASSIGNMENT:** (see above) |
|      | 2/15       |                                                                              |                                                                                           |
|      | 2/17       |                                                                              |                                                                                           |
| 6    | 2/20       | Engineering Economics; Patent Application                                       | • Project Phase: Building  
• **HW Assignment:** Provisional Patent Application (SLO 7)  
• **WEEKLY ASSIGNMENT:** (see above) |
|      | 2/22       |                                                                              |                                                                                           |
|      | 2/24       |                                                                              |                                                                                           |
| 7    | 2/27       | Engineering Economics; Review of Video Recordings, and presentation skills     | • Project Phase: Implementation  
• **WEEKLY ASSIGNMENT:** (see above)  
• Review of video recordings (SLO 2) |
|      | 3/1        |                                                                              |                                                                                           |
|      | 3/3        |                                                                              |                                                                                           |
| 8    | 3/6        | Engineering Ethics and Ethics Writing                                          | • Project Phase: Implementation  
• **CP Progress Report – Oral Presentation and Report (video recording)** (SLO 2,3,4,6,8) |
|      | 3/8        |                                                                              |                                                                                           |
|      | 3/10       |                                                                              |                                                                                           |
| 9    | 3/13       |                                                                              | **SPRING BREAK**                                                                            |
|      | 3/17       |                                                                              |                                                                                           |
| 10   | 3/20       | **Guest Lecturer** (Engineer/Project Manager)*                                | • Project Phase: Testing and Troubleshooting  
• **WEEKLY ASSIGNMENT:** (see above)  
• Review of Video recording (SLO 2) |
|      | 3/22       |                                                                              |                                                                                           |
|      | 3/24       |                                                                              |                                                                                           |
| 11   | 3/27       | Social and economic impact of the project;                                   | • Project Phase: Testing and Troubleshooting  
• **WEEKLY ASSIGNMENT:** (see above) |
|      | 3/29       |                                                                              |                                                                                           |
|      | 3/31       |                                                                              |                                                                                           |
| 12   | 4/3        | Standards                                                                     | • Project Phase: Evaluation and Improvements                                                |
|      | 4/5        |                                                                              |                                                                                           |
|      | 4/7        |                                                                              |                                                                                           |
| 13   | 4/10       | **Intellectual Property and Patenting:** Guest Lecturer                       | • Project Phase: (Troubleshooting/modifications) Testing and Validation (SLO 6)  
• **WEEKLY ASSIGNMENT:** (see above) + updated patent application (SLO 7) |
|      | 4/12       |                                                                              |                                                                                           |
|      | 4/14       |                                                                              |                                                                                           |
| 14   | 4/17       | Lifelong learning; Webinar; current issues in engineering                    | • Project Phase: Final Evaluation  
• **WEEKLY ASSIGNMENT:** (see above) |
|      | 4/19       |                                                                              |                                                                                           |
|      | 4/21       |                                                                              |                                                                                           |
| 15   | 4/24       | Webinar: current issues in engineering                                         | Final Project Presentations - Dry Run; (SLO 2, 4, 8) oral presentations (PP);  
Course CDs, notebooks due 3 copies of **bound** Final CP Reports due |
|      | 4/26       |                                                                              |                                                                                           |
|      | 4/28       |                                                                              |                                                                                           |
| 16   | 5/1        | Final Presentation Prep                                                        |                                                                                           |
| **FINAL EXAM DATE** | **05/05** | **Friday 1:45 p.m. – 4:15 p.m.**                                                                                    | **FORMAL FINAL PROJECT ORAL PRESENTATIONS** (SLO 2,3,4,6,8) |

*subject to change  
§ based on published final exam schedule
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 work will be allowed except in the case of a documented extreme emergency, or University-accepted excuse. Team presentations must be given by all team members. There are no makeups for missed presentations.

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. For this course, the final exam is a final presentation during exam week to internal and external evaluators and must be completed as a team.

Participation
Students are expected to participate in the in-class and online exercises, discussions, and team work. Members not contributing to team assignments will not receive full credit for that team assignment.

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, instragramming, 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](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. Please consult with the instructor before you decide to drop to be sure it is the best thing to do. Just stopping attendance and participation WILL NOT automatically result in your being dropped from the class. Should dropping the course be the best course of action, visit the Office of the University Registrar for the Course Drop Form that must submitted. No student is eligible to receive a W without completing the official drop process by this deadline.
  
  The grade of W will be assigned to any student officially dropping a course by Friday, Friday, April 7, 2017. 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 7, 2017, a student will not be allowed to drop a course. Please consult the Academic Calendar ([http://www.tamucc.edu/academics/calendar/](http://www.tamucc.edu/academics/calendar/)) for the last day to drop a course as well as other deadlines.

- **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**
  The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please call or visit Disability Services at (361) 825-5816 in Corpus Christi Hall 116.

  If you are a returning veteran and are experiencing cognitive and/or physical access issues in the classroom or on campus, please contact the Disability Services office for assistance at (361) 825-5816.

- **Statement of Academic Continuity**
  In the event of an unforeseen adverse event, such as a major hurricane and classes could not be held on the campus of Texas A&M University–Corpus Christi; this course would continue through the use of Blackboard and/or email. In addition, the syllabus and class activities may be modified to allow continuation of the course. Ideally, University facilities (i.e., emails, web sites, and Blackboard) will be operational within two days of the closing of the physical campus. However, students need to make certain that the course instructor has a primary and a secondary means of contacting each student.

L. **OTHER INFORMATION**

- **Academic Advising**
  The College of Science & Engineering requires that students meet with an Academic Advisor as soon as they are ready to declare a major. The Academic Advisor will set up a degree plan, which must be signed by the student, a faculty mentor, and the department chair. Meetings are by appointment only; advisors do not take walk-ins. Please call or stop by the Advising Center to check availability and schedule an appointment. The College’s
Academic Advising Center is located in Center for Instruction 350 or can be reached at (361) 825-3928.

- **Teamwork**
  Students are expected to work in teams and contribute to teamwork equally. Peer assessment scores will be considered when computing individual grades in team assignments.

**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.