

ENTC 4350.001/4350.201  
F 9:00 - 9:50 (lec), F 10:00 - 14:50 (lab)  
Location: ST 220  
Spring 2011  
Office Telephone: 361-825-3378

Dr. Ruby Mehrubeoglu  
Office: ST 222B  
Office Hours:  
TR 14:00-16:00, F 15:00-16:00  
E-Mail: Ruby.MehrubeogluATtamucc.edu

## **ENTC 4350 Capstone Projects**

### **COURSE INFORMATION**

Prerequisite: ENTC 4415  
Credit Hours: 3 (1:5)  
Meeting Times: F 9:00-9:50 a.m. (Lecture), F 10:00 a.m. -2:50 p.m. (Laboratory)  
Meeting Places: ST 220 (lecture and lab)

### **PROFESSOR INFORMATION**

Dr. Ruby Mehrubeoglu (Dr. M.)  
Office Location: ST 222B  
Office Telephone: (361) 825-3378  
FAX Number: (361) 825-5848  
Office Hours: TR 2:00–4:00 p.m., F 3:00–4:00 p.m., and by appointment  
E-mail Address: Ruby.MehrubeogluATtamucc.edu

### **COURSE DESCRIPTION**

This course allows students to employ the knowledge attained in other courses to implement (including building, testing, and documenting) the approved project in ENTC 4315, within budget and on schedule. Course requirements include a written report and oral presentations.

### **LEARNING OBJECTIVES (STUDENT LEARNING OUTCOMES)**

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

### **REQUIRED READINGS**

1. David F. Beer and David A. McMurrey, *A Guide to Writing as an Engineer*, 3<sup>rd</sup> Edition, Wiley, 2010 (ISBN 978-0-470-41701-0)
2. C. Chatfield and T. Johnson, *Microsoft® Office Project 2007 Step by Step*, Microsoft, 2007. (ISBN: 0735623058 / 0-7356-2305-8)

## RECOMMENDED READING

1. D. G. Newnan, T. G. Eschenbach and J. P. Lavelle, *Engineering Economic Analysis*, 10<sup>th</sup> Ed., New York: Oxford University Press, 2009.

## INSTRUCTIONAL METHODS

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

## MAJOR COURSE REQUIREMENTS AND ASSESSMENT

The students are required to keep a real-time notebook of their capstone project from the beginning to the end of the capstone project's lifecycle. In addition, students are expected to meet with their capstone project advisors weekly, and submit weekly progress summaries and present oral updates to the class. Assessment is based on project updates, notebooks, homework assignments, pop quizzes, laboratory assignments and reports, capstone project reports and presentations. You may examine the final exam within four weeks after the final grades are assigned. The final grade is computed as follows.

	<i>Points</i>		<b>Total grade</b>	<i>Tentative Grade</i>
Weekly Advisor Meeting Summaries and in-class updates	8		$90 \leq \text{total}$	A
Notebooks (team)	5		$80 \leq \text{total} < 90$	B
Homework + Pop Quizzes	9		$70 \leq \text{total} < 80$	C
Lab Assignments	8		$60 \leq \text{total} < 70$	D
Capstone Project Proposal and Oral Presentation	10		$\text{total} < 60$	F
Progress Report and Oral Presentation	20			
Final Project Defense and Report	40			
<b>Total</b>	<b>100</b>			

## ATTENDANCE POLICY

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.

## CLASSROOM/PROFESSIONAL BEHAVIOR

Texas A&M University-Corpus Christi, as an academic community, requires that each individual respect the needs of others to study and learn in a peaceful atmosphere. Under Article III of the Student Code of Conduct, classroom behavior that interferes with either (a) the instructor's ability to conduct the class or (b) the ability of other students to profit from the instructional program may be considered a breach of the peace and is subject to disciplinary sanction outlined in article VII of the Student Code of Conduct. Students engaging in unacceptable behavior may be instructed to leave the classroom. This prohibition applies to all instructional forums, including classrooms, electronic classrooms, labs, discussion groups, field trips, etc.

## **CELL PHONE/ELECTRONIC DEVICE USAGE**

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, browsing on the internet, or disrupting the classroom activities. Anyone displaying unprofessional classroom behavior will be asked to leave the classroom or the laboratory.

## **LATE ASSIGNMENTS**

Late assignments will only be accepted with penalty. 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.

## **ACADEMIC INTEGRITY**

Plagiarism and other academic dishonesty are not tolerated. Your attention is called to the University policy in the Student Handbook.

## **FOOD AND DRINK**

Eating or drinking is NOT permitted in the labs. Students with food or drink will be asked to discard them, or leave the room.

## **SAFETY**

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

## **GRADE APPEALS**

As stated in University Rule 13.02.99.C2, Student Grade Appeals, 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 Rule 13.02.99.C2, Student Grade Appeals, and University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules Web site at [http://www.tamucc.edu/provost/university\\_rules/index.html](http://www.tamucc.edu/provost/university_rules/index.html). For assistance and/or guidance in the grade appeal process, students may contact the Office of Student Affairs.

## **DISABILITIES ACCOMMODATIONS**

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 Driftwood 101.

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.

<b>COURSE OUTLINE: Weekly Schedule*</b>				
<b>WEEK</b>	<b>Date</b>	<b>Reading</b>	<b>Lecture Topics *</b>	<b>Laboratory Topics and Assignments *</b>
1	01/14	Ch 16, 17 (MS OP)	Review of syllabus; Review of safety and security procedures; Lab notebooks	Lab Safety; Workshop Tour <ul style="list-style-type: none"> <li>• <b>Lab Assignment:</b> Gantt chart, network diagram and calendar view of the proposed capstone project plan</li> <li>• <b>Assignment:</b> Set up weekly appointments with capstone project advisor</li> </ul>
2	01/21	Ch 18, 19 (MS OP)  Ch 1,2 (GWE)	Student updates on projects –resource allocation –schedule –budget Identifying vendors for materials purchase	<ul style="list-style-type: none"> <li>• <b>Lab Assignment:</b> Measuring Performance with Earned Value Analysis</li> <li>• <b>WEEKLY ASSIGNMENT:</b> <ol style="list-style-type: none"> <li>a) Weekly advisor-approved advisor meeting summaries</li> <li>b) Notebook reviews by instructor</li> </ol> </li> <li>• Project Phase: Updated CAD/circuit drawings, and theoretical analysis of performance</li> </ul>
3	01/28	Ch 20, 21 (MS OP)  Ch 3,5 (GWE)	<b>Guest Lecturer – PMI</b>	<ul style="list-style-type: none"> <li>• <b>Lab Assignment:</b> Tracking work and updating capstone project plan</li> <li>• <b>HW Assignment:</b> Final DESIGN, RESOURCES and BUDGET due</li> <li>• <b>WEEKLY ASSIGNMENT:</b> (see above)</li> </ul>
4	02/04	Ch 22 (MS OP)  Ch 5,6,9 (GWE)	Technical Writing	<ul style="list-style-type: none"> <li>• <b>Capstone Project Proposal – Oral Presentation and Report</b></li> <li>• <b>Lab Assignment:</b> Managing Risks, Issues and documentation</li> <li>• <b>WEEKLY ASSIGNMENT:</b> (see above)</li> <li>• Project Phase: Complete the acquisition of materials for the project</li> </ul>
5	02/11	Ch 7, 8 (GWE)	Social and economic impact of the project; technical writing	<ul style="list-style-type: none"> <li>• Project Phase: Building</li> <li>• <b>WEEKLY ASSIGNMENT:</b> (see above)</li> </ul>
6	02/18		<b>Intellectual Property and Patenting: Guest Lecturer</b>	<ul style="list-style-type: none"> <li>• Project Phase: Building</li> <li>• <b>HW Assignment:</b> Patent Application</li> <li>• <b>WEEKLY ASSIGNMENT:</b> (see above)</li> </ul>
7	02/25	Ch 10 (GWE)	Lifelong learning; Webinar	<ul style="list-style-type: none"> <li>• Project Phase: Implementation</li> <li>• <b>WEEKLY ASSIGNMENT:</b> (see above)</li> </ul>
8	03/04	Ch 11 (GWE)	Engineering Ethics and Ethics Writing	<ul style="list-style-type: none"> <li>• Project Phase: Implementation</li> <li>• <b>WEEKLY ASSIGNMENT:</b> (see above)</li> </ul>
9	03/11		Engineering Economics	<ul style="list-style-type: none"> <li>• Project Phase: Testing and Troubleshooting</li> <li>• <b>Progress Report and Presentation</b></li> </ul>
10	03/18			<b>SPRING BREAK</b>
11	03/25		Review of Engineering Concepts	<ul style="list-style-type: none"> <li>• Project Phase: Testing and troubleshooting</li> <li>• <b>WEEKLY ASSIGNMENT:</b> (see above)</li> </ul>
12	04/01		Review of Engineering Concepts	<ul style="list-style-type: none"> <li>• Project Phase: Evaluation and Improvements</li> <li>• <b>WEEKLY ASSIGNMENT:</b> (see above)</li> </ul>
13	04/08		Review of Engineering Concepts	<ul style="list-style-type: none"> <li>• Project Phase: (Troubleshooting,) Testing and Validation</li> <li>• <b>WEEKLY ASSIGNMENT:</b> (see above)</li> </ul>
14	04/15		Review of Engineering Concepts	<ul style="list-style-type: none"> <li>• Project Phase: (Troubleshooting/modifying) Testing and Validation</li> <li>• <b>WEEKLY ASSIGNMENT:</b> (see above)</li> </ul>
15	04/22		Review of Engineering Concepts	<ul style="list-style-type: none"> <li>• Project Phase: Final Evaluation</li> <li>• <b>WEEKLY ASSIGNMENT:</b> (see above)</li> </ul>
16	04/29			<b>Final Project Presentations</b> - Dry run; Video Recording; CDs due (notebooks, oral presentations and final reports will be due the day of the final exam)
Final Exam Date*: Friday, 6 May 2011, 1:45 p.m. - 4:15 p.m. (subject to change based on updated University Final Exam Schedule) – The students will be presenting their final capstone projects to faculty, technical staff, students and industry representatives (Oral Defense, Final Project Report, and Notebooks Due)				
* Tentative Schedule; subject to change				