**The University of Texas Pan-American**

**College of Science and Engineering**

**Department of Mechanical Engineering**

**Upgraded January 8, 2013**

**Course Number** MECE 4362

**Course Title** Senior Design Project II

**Course Time/Place** F 1:10 – 6:30pm, Engr. 1.236

**Instructor** Dr. Kamal Sarkar

**Office/Phone** 3.243 Engineering Building / (956) 665-2682

**Group Meeting:** MTWR 1:00-5:00 PM by scheduling

 Each group will meet for 45 minutes Every Week

**Email** ksarkar@utpa.edu

**Website** [www.engr.panam.edu/~rafree/](http://www.engr.panam.edu/~rafree/)

**Pre-requisites** Undergraduate level MECE 4361, Minimum Grade of C

# Catalog Description This course is a continuation of MECE 4361. Students will conduct a comprehensive engineering design of the concept generated in MECE 4361, and report on the results. Synthesis using past coursework and outside reference material will be expected. Periodic progress reports and final oral and written reports will be required. Students may not receive credit for both MECE 4362 and ENGR 4362. Prerequisite: MECE 4361

**Text** None

**References:** Course andFaculty Advisors will identify appropriate references.

**Equipment:** Permanently bound lab notebook for individuals and three ring binder for

 the team.

**Course Requirements and Grading Scheme:**

Meet with both your Course Advisor (CA) Dr. Sarkar for 45 minutes and Faculty Advisor (FA) for at least half-an-hour every week.

1. **(25%) Individual Effort**

 Each group to arrange a time with your FA – (You already know your FA from last

 semester!)

**a.** Individual attendance.

**b.** Some form of work schedule (e.g., Gantt chart) outlining your individual project activities, work dates, and completion dates.

**c.** A logbook in which you document your progress - hopefully this will correlate well with your work schedule.This is to include a brief summary of your interaction with your "Faculty Advisor" (**FA)**, signed and dated by your **FA**, each week.

**d.** Group member evaluation of self and other group members.

1. **(10%) Attendance:**

You **must** ensure that you **attend the Organizational Meeting and all the Class Reviews since they will affect your grade.**

1. **(40%) Group Grade**

A detailed written report containing an **analytically based design**, complete with professional design drawings and at least a plan to test for design specification satisfaction (does your design meet the stated engineering specifications). A prototype/production run, or a computer simulation is expected. Data collection and data analysis are parts of the evaluation.

1. **(5%) Poster Grade:** A Poster which will be posted in the ME building announcing the final presentations.

1. **(20%) Final Presentation:**

A formal oral presentation. Note that there will be five zero credit "technical update / progress report" presentations and one zero credit “dress rehearsal” during the term (see tentative schedule given below). **(20%)** **Group grade!**

**Note: Your CA (effort) and FA (technical content) and the ME faculty led by the ME department Chair (communication) will collaborate to determine your grade.**

**Mechanical Engineering Department Classroom Policies**

**Attendance**

1. Attendance will be taken every time the class meets. Any student arriving to class **5 minutes** after the class has started will not be allowed in class. Students will be allowed a **maximum** of 5 absences for the whole semester for classes meeting three times a week, 3 absences for classes meeting twice a week, and 2 absences for classes meeting once a week. A **point** will be deducted from the total (100%) for each **unexcused** absence exceeding the maximum allowable.
2. Students **will not** be permitted to leave the classroom during lectures and exams except for **extreme emergencies**.

**Homework and Exams**

**There is no Home Work or Exam in this course.**

**Plagiarism**

Any instance of cheating or plagiarism will result in **loss of credit** for the work, and will be reported to the Chair of the ME Department and/or the Dean of Students for appropriate action which may include **loss of credit** for the course or **dismissal** from the University.

**Drop Policy**

Students can withdraw from a course through the *Office of Records and Registration* on or prior to:

* January 18, 2013: First day of class
* January 22, 2013, last day to late register or add a course.
* January 30, 2013, 12th class day, last day to drop a course without it counting toward the 6 drop limit.
* February 12, 2013, last day to change to Non-Credit.
* Spring Break: March 10-15, 2013
* April 24, 2013, last day to drop a course or withdraw.

For further details and clarifications, students are encouraged to contact the *Office of Records and Registration at 665-2481*.

**American Disabilities Act Statement**

If you have a documented disability which will make it difficult for you to carry out the work as I have outlined and/or if you need special accommodations/assistance due to the disability, please contact Disability Services, University Center 305A, (956) 381-2659. Appropriate arrangements/accommodations can be arranged.

**Tentative Course Schedule**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | *Day* | *Date* | *Activity: All in Engr. 1.236 unless notified* | *Time* |
|  |  |  |  |  |
| 1 | Fri | Jan 18 | Organizational Meeting | 1:10pm |
| 2 | Fri | Jan 25 | Class Review | 1:10pm |
| 3 | Fri | Feb 1 | **Technical Update #1A** | **1:10pm** |
| 4 | Fri | Feb 8 | **Technical Update #1B** | 1:10pm |
| 5 | Fri | Feb 15 | Class Review | **1:10pm** |
| 6 | Fri | Feb 22 | **Technical Update #2A** | 1:10pm |
| 7 | Fri | Mar 1 | **Technical Update #2B** | **1:10pm** |
| 8 | Fri | Mar 8 | Class Review | 1:10pm |
| **9** | **Fri** |  | **3/10-15: SPRING BREAK *YEAH!!!*** |  |
| 10 | Fri | Mar 22 | **Technical Update #3A** | 1:10pm |
| 11 | Fri | Mar 29 | **Easter Holiday, No Classes!** | **1:10pm** |
| **12** | **Fri** | **Apr 5** | **Technical Update #3B** |  |
| 13 | Fri | Apr 12 | **Draft of Final Report Due** | **4pm** |
| 14 | Fri | Apr 19 | **Week of Dress Rehearsals (a couple a day)** | **TBA** |
| 15 | Thurs | Apr 25 | **Poster Due** **Final Report Draft Returned** | **4pm** |
| 16 | Fri | Apr 26 | **Final Report Due****Hard Deadline no Extensions** | **4pm** |
|  | Wed | May 1 | Last day of classes |  |
| 17 | Thurs | May 2 | **Formal Presentations** | **9am – 5pm** |
| 18 | Fri | May 3 | **Formal Presentations** | **9am – 5pm** |
|  |  |  |  |  |

Mechanical Engineering Program Educational Objectives

The Educational Objectives of the Mechanical Engineering Program at The University of Texas - Pan American are to produce graduates who:

1. have the knowledge and technical skills required to be and to remain productive in the field of mechanical engineering.
2. have an understanding of the importance of professionalism, ethics, safety and socioeconomics concerns in resolving technical problems.
3. are capable of functioning in diverse environments.

Educational Outcomes (Engineering Programs)

 It will be demonstrated that the student:

1. is able to use knowledge of mathematics, basic sciences and engineering to analyze (identify, formulate, and solve) problems in mechanical engineering.
2. is able to design and conduct experiments and interpret results.
3. is able to design mechanical devices, systems or processes that meet given specifications.
4. is able to function in multi-disciplinary teams.
5. is able to communicate ideas effectively in graphical, oral, and in written media.
6. understands the professional responsibility of an engineer and how engineering solution impacts safety, economics, ethics, politics, societal, cultural and contemporary issues.
7. understands the need for life long learning to keep abreast of current practice.
8. is able to use state of the art computational hardware and software for analysis, design and documentation (techniques, skills, and modern engineering tools necessary for engineering practice).

Fundamentals in Science and Mathematics (Mechanical Engineering)

 It will be demonstrated that the student:

1. has knowledge of chemistry and calculus-based physics with depth in at least one.
2. has the ability to apply advanced mathematics to problems involving thermal and mechanical systems.
3. has the ability to apply statistics and linear algebra to problems involving thermal and mechanical systems.

Fundamentals in Engineering

 It will be demonstrated that the student:

1. has the ability to create and annotate two-dimensional drawings, and generate three-dimensional computer based on solid models of mechanical components.
2. has the ability to design and analyze components and systems for mechanical and energy performance.
3. has the ability to specify and evaluate materials and manufacturing steps for mechanical components.
4. has the ability to conceive and conduct experiments to measure the performance of materials, components and systems, and to communicate the results.
5. has the ability to acquire new skills and specialized knowledge from published sources.

Senior Design II Course Outcomes

At the end of the courses the students will be able to:

1. Work on Teams, both as a Team-Leader and as a member.
2. Work in a diverse, globally competitive engineering environment
3. Communicate in various oral and written forms including, but not limited to, Weekly progress reports/memos, Design Journals, Technical Reports, Oral Presentations.
4. Understand Design process including; Scheduling, Problem formulation, Concept generation, Concept selection, and Embodiment design.
5. Capable of collecting and analyzing data and make inferences from them
6. Understand that the mathematical models used for analysis are also used for design.
7. Apply the fundamentals of science, math, and engineering to the design of engineering systems.
8. Make effective use of math and engineering software for analysis, simulation, and design of engineering systems.
9. Have an appreciation of Professional issues including; Responsibility/Ethics, Legal Liability, and Intellectual property.
10. Appreciate the need for lifelong learning.
11. Ability to work in multi-cultural engineering environments

**In summary, you are ready to work effectively in a diverse engineering environment or simply put you are “more employable!”**