



**NORTHEASTERN UNIVERSITY**  
**College of Engineering**  
**Engineering Design**  
**GEU 110 COURSE OUTLINE**

**Course Number:** GEU 110  
**Quarter Offered:** Fall 2007  
**Total Credit Hours:** 4 credits  
**Weekly Format:** 2 Lectures, 1 Lab

**Instructor:** Dr. Beverly K. Jaeger  
**Office:** 363 Snell Engineering  
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**Phone:** (617) 373-5995  
**Screen Name:** saab0407 (AIM)

**Office Hours:** \_\_\_\_\_

To be arranged according to our schedules. For any other meetings times, we can make an appointment together.

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**COURSE GOALS:**

- Introduce students to the engineering profession and creative engineering problem-solving through design projects, presentations, and activities.
- Familiarize engineering students with the various engineering disciplines, the focus of each of the disciplines, and their interrelationships.
- Provide historical perspective on engineering design processes, successes, challenges, and failures and their influence on contemporary society and modern engineering.
- Inspire and instill an appreciation for the engineering profession, its ethics, and practices.

**COURSE OBJECTIVES:**

- Learn and apply all of the steps of the engineering design process in proposing and building working devices or models in design projects.
- Design and construct a working device or model that meets preset constraints and specifications.
- Review and evaluate engineering failures and successes for their relationships to engineering design problems, solutions, and processes.
- Conduct a needs assessment to design a product or engineer a solution by applying the engineering design process steps and documenting and reporting on each phase.
- Describe the scientific principles and technical background required for the proposed design project.
- Outline the patents related to the proposed design and evaluate their pertinence to the solution.
- Apply the engineering principles revealed in class exercises on teamwork, creativity, problem solving, and on evaluation, selection, and implementation of solution alternatives.
- Develop and apply drawing and sketching skills to communicate design and engineering information graphically. Apply the principles of orthographic projection in engineering design.
- Learn and practice technical drawing and engineering graphics communication using AutoCAD.
- Apply skills of technical drawing to specific engineering projects.
- Formulate engineering problems for numerical solutions; conduct relevant computations, analyze, organize, and present results using Microsoft Excel software.
- Create and deliver individual and team presentations on engineering design projects and topics.
- Generate a report for each design project that reflects work completed in each step of the design process and present technical drawings that apply to the relevant design.

Skills and perspectives relate directly to the shared goals of Northeastern University's Academic Common Experience (ACE) initiative.

## **REQUIRED MATERIALS & RESOURCES:**

1. *Engineering by Design 2<sup>nd</sup> ed*, G. Volland, Pearson Prentice-Hall Publishing Company, NJ, (2004).
2. *Discovering AutoCAD 2007*, Mark Dix and Paul Riley, Prentice-Hall Publishing Company, NJ (2007).
3. A **coe** (College of Engineering) e-mail account that you check and use regularly for course purposes.  
An account can be obtained through the Account Request link at: <http://www.coe.neu.edu/computer>

## **RECOMMENDED MATERIALS & SOFTWARE USED FOR SKILL-BASED LEARNING:**

1. Software: *AutoCAD® 2005, 2006 or 2007*.
2. Software: *Microsoft® Excel or Microsoft Office or XP with Word, PowerPoint, and Excel*.
3. Reading: *Introduction to Excel 2002*, D. Kuncicky, Prentice-Hall Publishing Company, NJ (2003).

## **AUTOCAD AND EXCEL LABORATORY SESSIONS:**

208 Snell Engineering is the ECALC Lab: Each Thursday, the Lab module will be held in this facility.

## **EVALUATION:**

Final course grades will be computed using the following percentages:

<b>10%</b>	Minor Design Project
<b>15%</b>	Homework and Attendance
<b>25%</b>	Design Exams: Midterm - 10%, Final - 15%
<b>25%</b>	AutoCAD: Homework - 15%, Quizzes - 10%
<b>25%</b>	Major Design Project: Term Progress - 10%, Technical Report - 10%, Presentation - 5%

The Major Design Project will include a variety of interim assignments so that the instructor can provide feedback throughout the design process. The final technical report should include all relevant material contained in the earlier assignments and previously submitted work (possibly edited). Students are responsible for all topics covered in class and all assignment material. Design quizzes and examinations are CLOSED BOOKS and CLOSED NOTES. Unexcused late work is unacceptable; if accepted for unique reasons, the grade is reduced according to the GEU policy. No assignments may be accepted 1 week after the due date, if the solution has been made available, or if the graded work has been returned.

## **READING ASSIGNMENTS:**

Students should read the sections in the text indicated on the course outline prior to the lecture in which the material will be discussed. It is not expected that you will fully understand the material at that time. Reading first and identifying what you are unclear on, or have deeper interest in, will make it easier in class and facilitate meaningful questions and discussions.

## **WRITTEN ASSIGNMENTS:**

All homework assignments must be submitted on time and word processed unless otherwise indicated. You may clarify minor aspects of your work with other students. You may not copy the work of another student nor fully collaborate to complete an entire problem. Therefore, unless it is work on a designated team project, all work submitted must be your own.

When doing drawings or sketches, use pencil, label components and drawings clearly, and use a straightedge when appropriate.

## **SPECIAL ACCOMMODATIONS:**

If you have specific physical, psychiatric, or learning disabilities that you believe may require accommodations for this course, please meet with me after class or during my conference hours to discuss appropriate adaptations or modifications which might be helpful for you. The Disability Resource Center (DRC), which is located on campus in 20 Dodge Hall (extension 2675) can provide you with information and other assistance to help manage any challenges that may affect your

performance in your coursework. The University requires that you provide documentation of your disability to the DRC.

### **ETHICAL BEHAVIOR:**

No collaboration is allowed on individual assignments under penalty of failure. Plagiarism, cheating, and any form of unauthorized collaboration will not be tolerated and will be handled in accordance with University policies described in the Student Handbook. All engineering majors are required to be familiar with the Honor Code of our College of Engineering that is included in the GEU 100 course material, and with professional engineering codes of ethics (see, for example, the NSPE Code of Ethics presented in the *Engineering By Design* textbook on pages 511-514).

Although students are encouraged to discuss some homework assignments and work together to develop a deeper understanding of the topics presented in this course, submission of others' work, efforts, or ideas as your own is not permitted. Each student is expected to prepare and submit his/her own programs, reports, drawings, and other materials unless otherwise designated as collaborative work.

Copying and sharing of student work such as computer files, documents, spreadsheets, or drawings is not allowed. If multiple students' work is suspiciously similar, a penalty may be assessed to both students. If a situation arises in which you are uncertain whether cooperation with another student would constitute cheating or some other violation of the honor code, please ask the instructor for guidance and clarification of these rules. Suspected violators will be referred to the Student Court for review, where penalties may include but are not restricted to: zero credit for the work, student placed on probation, submission of judicial findings in the students' permanent record, jeopardizing the students' status in the Engineering Program.

### **EXPECTATIONS FROM THE COLLEGE OF ENGINEERING:**

- (1) We expect that you will successfully learn the course material and that your work will earn a fair grade. This will require a reasonable amount of work on your part. If you satisfy the remaining expectations, you will be well on your way to success in Engineering Design.
- (2) We expect that you will complete the assigned readings before coming to class.
- (3) We expect that you will attend every class, take comprehensive notes and participate (you are not simply a recorder). We expect that you will study your notes and the required texts and apply the relevant information as appropriate.
- (4) If you miss a class, we expect that you will get the notes from a classmate and review them before the next class and discuss your absence with me.
- (5) We expect that you will do your homework and submit it in accordance with given specifications on the due date.
- (6) We expect that you will organize a study group for this course. We know of no better way to overcome hurdles when doing homework or to prepare for an exam.
- (7) We expect you to be an active learner and take responsibility for learning the material – it is not just surviving homework assignments and exams. Seek help from Professor Jaeger or from members of your team, study group, tutors, or Student Services (220 SN).
- (8) We expect that you will treat other members of the class with respect and not represent the work of others as your own.
- (9) We expect your project team to work together on all aspects of your design project. If there are any conflicts or problems, we expect you will resolve them or bring them to me early in the semester to be resolved. We expect your team to work as professionals to accomplish your common goals for your projects.
- (10) We finally expect and hope that we will have a good time and learn a lot of applicable material, competencies, and concepts.



## SOME THINGS TO BE THINKING ABOUT ...

- ✦ Who you would like to work with for a minor building project
- ✦ Some device that you can take apart and analyze and rebuild
- ✦ Who you would like to work with for a major design project
- ✦ A engineering project that is humanitarian, and serviced-based
- ✦ A movie that has ridiculous and/or amazingly accurate engineering feats
- ✦ Something of engineering interest that you would like to present for 2 minutes this term.

