GEU 110 – Freshman Engineering Design

Course Syllabus

Course Number: GE U110
Instructor: Donald Goldthwaite
Quarter Offered: Fall 2006
Office: 207 Snell Engineering
Total Credit Hours: 4 credits
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Office Hours: Monday: 12:30 - 1:30 Thursday 2:00 – 3:00, or by appointment (may change).
Weekly Format: 2 lecture sessions and 1 lab session

Course Goals:
- Introduce students to the engineering profession and creative engineering problem-solving through design projects, presentations, and activities.
- Familiarize students with the various engineering disciplines and their interrelationships.
- Provide historical perspective on engineering design processes, successes, challenges, failures and their influence on contemporary society.
- 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. (Minor Design Project).
- 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 Excel software.
Create and deliver individual and team presentations on engineering design projects and topics.
Generate a report for the design project that reflects work completed in each step of the design process and present technical drawings that apply to the approved design

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

**REQUIRED MATERIALS:**

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

**CAD LABORATORY:**
Each Monday we will meet in 268 Snell Engineering building for AutoCad Lab.

**EVALUATION:**
Final course grades will be computed using the following percentages:

- **10%**  Minor Design Project
- **15%**  Homework
- **5%**   Evaluative (attendance, attitude, effort, circumstance)
- **25%**  10% Mid-Term Exam & 15% Final Exam
- **5%**   Quizzes
- **20%**  AutoCAD: Homework - 15%, Quizzes - 5%
- **25%**  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 process. The final technical report should include all relevant material contained in the earlier assignments with recommended changes made. Students are responsible for **ALL** topics covered in class and **ALL** assigned reading, and homework assignments. Design quizzes and examinations are **CLOSED BOOKS** and **CLOSED NOTES**. Late assignments are not acceptable.

**READING ASSIGNMENTS:**
Students **must** read the sections in the text listed on the reading assignment by the date indicated. It is not expected that you will fully understand the material at that time. Reading the material first and identifying what you are unclear on, or have deeper interest in will enhance classtime experience and facilitate meaningful questions and discussions.
**Written Assignments:**

All homework assignments **must be submitted on time**, and **typed or created with a word processor** unless otherwise indicated. Unless it is work on your team design project, the work submitted must be your own. When doing drawings or sketches, use pencil, use a straightedge and label components and drawings clearly. Strive for clarity and lack of ambiguity. Always put your best foot forward.

**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 (ext 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 should be familiar with the [Honor Code](#) of the 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 Voland textbook on pages 511-514).

Although students are encouraged to discuss homework assignments in a broad and general context and work together to develop a deeper understanding of the topics presented, submission of others' work, efforts, or ideas as your own will not be tolerated under any circumstance. Each student is expected to prepare and submit his/her own programs, reports, drawings, and other materials unless otherwise designated as collaborative work.

Copying of computer files, documents, spreadsheets, or drawings is not allowed. If two students' work is suspiciously similar, a penalty may be assessed to both students. If a situation arises in which you are uncertain if 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 on the work, student placed on probation, submission of judicial findings in the students’ permanent record, and jeopardy of the students’ status in the Engineering Program.

**Expectations:**

1. I expect that you will successfully learn the course material and that you will earn a good 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.

2. I expect that you will read (not necessarily fully understand) the assigned readings **before** coming to class.
I expect that you will strive to attend every class, take comprehensive notes and participate (you are not simply a recorder). Sometimes statements or comments not written on the board are important and should be noted. I expect that you will study your notes and the texts.

If you miss a class, I expect that you will get the notes from a classmate and review them before the next class.

I expect that you will do your homework and submit it according to specifications on the date due.

I expect that you will organize a study group for this course. I know of no better way to overcome hurdles when doing homework or to prepare for an exam.

I expect you to be an active learner and take responsibility for learning the material - not just surviving homework assignments and exams. Seek help from me or from members of your study group.

I expect that you will treat other members of the class with respect and not represent the work of others as your own.

I expect your project team to work together on all aspects of your design project. If there are any conflicts or problems, I expect you will resolve them or bring them to me early in the semester to be resolved. I expect your team to work as professionals to accomplish your goals for your projects.

I also expect that we will have a good time and learn a lot.