PENNSTATE

Introduction to Engineering Design

EDSGN100 – Section 011 Spring 2010

Scientists investigate that which already is; engineers create that which has never been.
- Theodore von Karman, aerospace engineer

Instructor: Elizabeth (Liz) Kisenwether Assistant Professor, School of Engineering Design

e-mail: exk13@psu.edu

Office Phone: 863-1531 **Office FAX:** 863-7229 **Office:** 213 Hammond Building

Office Hours: Monday 1-2 p.m. Wed. 2-3 p.m. Thursday 10-11 a.m., and by appt.

Class times: MWF 10:10 – 12:05
Mon.: Graphics /306 Hammond Wed.: Computer /315 Hammond Fri.: Design/312 Hammond

Teaching Assistant:
Computer and Design Lab: TBD

Course Overview:

EDSGN100 is a first-year engineering course - required for most engineering majors. Titled ***Introduction to Engineering Design***, the class uses a design-driven curriculum with emphasis placed on skills such as team-based design, communication skills (graphical, oral and written), and computer-aided analysis tools. The course will introduce you to the engineering approach to problem solving with strong references to basic science and math skills, as well as testing and evaluation design ideas by building prototypes. The design projects are a total of at least 30 hours of in-class work (one-third of the course). Two major design projects will be assigned during the semester, and each will require you to work in a team. **Your course grade will reflect your ability to function effectively as a team member.**

Course Learning Objectives:

1. understand and use the design process well in all the course projects, ability to extend the design process to general problem solving, and recognize the value of creativity in the engineering design process.
2. develop basic skills in 3-D solid modeling CAD (Computer-Aided Design) using SolidWorks
3. acquire 3D visualization skills to draw and communicate design ideas and concepts.
4. contribute on team-based projects, solve inter-team problems and develop communication skills.
5. produce a well-organized website summarizing your EDSGN100 project work

---

Skills acquired by students in EDG100:

Computing: Solid Modeling/CAD (SolidWorks), EXCEL (spreadsheet), PowerPoint (multimedia presentations)
Internet Skills: use PSU access accounts and internet resources, create HTML documents, develop and post an EDSGN100 web page using the Penn State PASS system and/or ftp (file transfer protocol)

Graphics: understand and draw multiview, isometric, and oblique sketches; use scales, dimension drawings, develop section views, and understand working drawings
Lab skills: experimental methods, data acquisition and analysis, prototype building and testing
Design Methods/skills: customer needs assessments, concept generation, design requirement, specifications and selection matrices, safety, cost effectiveness, presentations, teamwork, ethics
Presentation Skills: develop and present a technical presentations both as part of a team and individually

---

Academic Integrity

Academic integrity is a basic guiding principle for all academic activity at The Pennsylvania State University. You are expected to act in accordance with this principle. Academic integrity is the pursuit of scholarly activity in an open, honest and responsible manner. Academic integrity includes a commitment not to engage in or tolerate acts of falsification, misrepresentation or deception. Such acts of dishonesty violate the fundamental ethical principles of the University community and compromise the worth of work completed by others. The list of academic integrity violations includes cheating, copying on a test, plagiarism, acts of aiding or abetting, submitting previous work, tampering with work, ghosting, altering exams and computer theft of programs/materials. An explicit list of examples of academic integrity violations is found at: http://www.engr.psu.edu/Forms/AcademicIntegrity/precedent_students.pdf

This class will be expected to follow the academic integrity guidelines. Violations will be addressed using the steps outlined at http://www.engr.psu.edu/Forms/AcademicIntegrity/policies.pdf . Students will be required to complete the **Academic Integrity Form** (see http://www.engr.psu.edu/Forms/AcademicIntegrity/form.pdf) which becomes part of the student's permanent record.

Required text

- Introduction to Engineering Design - McGraw Hill Learning Solutions,©2008 ISBN-13: 978-0-07-723421-8 (paperback). See reading assignment schedule. Copies of this text are on reserve in the Engineering Library (3rd floor Hammond Building).

Equipment required - three options

- **Option 1:** Staedler Geoset - 8 piece Geometry Set; available at Penn State Bookstore; includes 45/90 degree triangle, 30/60 degree triangle, compass, protractor, 0.5 mm fine line pencil, 6" ruler, eraser, leads

- **Option 2:** traditional Engineering Drafting Kit - used in previous semesters. Kit includes:

Bow compass and divider set	30/60 degree triangle
45/90 degree triangle	6" 180 degree Protractor
Circle template	12" architect's scale
12" engineer's scale	Erasing shield
Drafting tape (3/4" x 10 feet)	Eraser, white vinyl
Mechanical pencil - with 2F leads	Kit case

- **Option 3:** (for the budget-minded) - 0.5 mm fine line pencil, leads, good quality eraser (such as Staedtler Mars Plastic), 6" or longer ruler (inches and metric).

Strongly Suggested but not required

File storage media such as memory stick/thumb drive for CAD projects, spreadsheet data, digital camera photos, word processing, etc.

Material cost coverage

Students may be asked to up to $10 to purchase materials for design prototypes or models for design projects. The EDSGN100 course will make attempts to purchase prototyping items in bulk for use in multiple sections, and a small allotment will be made for use of the rapid prototyping machine, if desired, in order to minimize costs to the student.

Provided in Computer Lab (not to be purchased)

SolidWorks
All SolidWorks CAD effort can be done in the EDSGN100 Computer Lab (315 Hammond) or in Penn State ITS labs. The SolidWorks software can also be downloaded by Penn State students (150 day student version) from www.engr.psu.edu/swdownload. Note: students must be logged in to the Penn State network and indentified as a Penn State student to get Solidworks site license download access.

Grading

Due dates listed below are current best estimates at the start of the Fall08 semester.
Any updates will be provided in class as soon as changes are known.

Grading Topic	Weight	Grade Type	Date
Quiz #1: Design Project 1 + graphics	10%	Individual	Monday, Feb 22
Design Project #1	15% total: 10% - Prototype complete ; presentation 5% - report	Team	Friday Feb. 26 Wed. March 3
Personal EDSGN100 website	10% total 5% - first version *5% - final version**	Individual	Wed. Feb 10 Monday, May 3
SolidWorks	20% total; In-class Quiz 10% *Final CAD project 10%** [Completion of in-class tutorials and assignments assumed.]	Individual	Wed. March 24 Monday May 3
Graphics homework	10% (approx. 10 homework assignments)	Individual	across semester
Technology Presentations	5%	2-person teams	across semester
Design Project #2	20% total: 5% each - Project results, final presentation, in-class competition, *Project #2 website**	Team	Weeks of April 19 and 26
Quiz #2: Design Project #2 + graphics	10%	Individual	April 30

**checked as part of personal webpage. Final webpage grading will start on Monday May 3, 2010.*

Note: one team will be selected to attend the Project Showcase on Thursday April 29 from 1-3:30 p.m. This team gets +5% added to Design Project #2 team score.

Grading Policy:

> 93% = A	90% - 93% = A -	87% - 89% = B+	83% - 86% = B
80% - 82% = B -	75% - 79% = C+	70% - 74% = C	60% - 69% = D
< 59% = F			

EDSGN100 Class Policies

1. **Attendance and on-time arrival are expected for all class periods.** Because EDSGN100 meets for two hours each session, significant material is covered each meeting time. You need to be present to learn and contribute to your team's success. Course grade will be dropped to the next lower grade (such as from A - to B+) for every three classes missed that are not illness-related. All excused absences should be supported with some type of documentation, such as Penn State athletics travel notice, ROTC notice, etc. Missing class due to family vacation is not an excused absence. Please discuss participation in other significant Penn State activities, such as the Dance Marathon, with Prof. Kisenwether prior to the event. Two late arrivals (>10 minutes late) equates to one missed class.

To the best of your ability, send e-mail to the instructor (Prof. Kisenwether - exk13@psu.edu) before class if you are sick or injured and will not be attending class.

2. An assignment is considered late if not received by date/time specified. Graphics homework turned in late will be recorded as "late". All graphics homework will be accepted, regardless of how late, but may only get a check-mark, recognizing you did the work. Non-graphics assignments turned late will be graded, but with a 20% grade reduction for each day late.

3. Communication within a team is critical. Teams should first address team member problems (such as missed meetings or not completing work). However, do not let a small team issue or problem develop into a major issue. Team communication is key. Contact Prof. Kisenwether or the TA to help address and correct the problem early!

4. Excellent team work can improve your project grade by as much as 2% per design project. Poor teamwork can lower your course grade by 2% per design project. Team peer evaluations will be used to help determine your final score for that project.

5. No makeup labs will be available for the Design or Computer Labs during the daytime. These facilities are shared with **16** other EDSGN100 sections, and our section meeting times are limited to the scheduled days.

6. Follow all safety guidelines for the 313 Hammond Woodshop: safety glasses must be worn at all times while in 313 Hammond, and open-toed shoes are prohibited. A bin of safety glasses are located by each entry door into 313 Hammond.

OTHER INFORMATION: The 315 Hammond Computer Lab will open evenings Sunday → Thursday from 7-9 p.m. starting approximately the third week in the semester. Computer TAs are available to help with all questions related to EDSGN100 computer lab software (EXCEL, PowerPoint, SolidWorks). The exact evening hours for extra computer and design lab time will be announced in class.