EDSGN 100 - Engineering Design and Graphics

Instructor: Dr. Khaled Amleh, Associate Professor of Electrical Engineering
Web: http://www.personal.psu.edu/kaa13
E-mail: kaa13@psu.edu
Phone: (717)749-6208
Office location: 314 Sci/Tech. Building
Office Hours: MWF 1:00 - 2:30
Course title: EDSGN 100 "Engineering Design and Graphics"
Section: 002
Credits: 3
Class Meeting: MWF 2:30 - 4:20 in 313 Sci./Tech. Building

Text and Material:

- There is no textbook for this course. All necessary materials will be posted on Canvas (https://canvas.psu.edu). You will need your user ID and password to access the material.

- For the CAD-section, we will use SolidWorks, an industrial-strength solid-modeling computer program which is installed on all computers in the computer lab in the Bookstore Building and 313 Science/Technology Bldg.

Course Overview:

Welcome to the first-year engineering course, Introduction to Engineering Design! This is a design-driven curriculum with emphasis placed on skills such as: team work, communication skills (graphical, oral, and written), and computer-aided analysis tools. The curriculum will introduce you to the engineering approach to problem solving with strong references to basic science and math skills, as well as testing and evaluating design ideas by building working prototypes. The design projects are the total of 30 hours of in-class work (one third of the course).

Course Objectives:

- use the design process well in all the course projects, be able to extend the design process to general problem solving, and recognize the value of creativity in the engineering design process

- develop basic skills in 3-D solid modeling CAD (Computer-Aided Design)

- acquire 3D visualization skills to draw and communicate design ideas and concepts.

- operate well within a team, solve inter-team problems and develop communication skills.

- produce a website summarizing your EDSGN 100 project work.
Skills Acquired by Students in EDSGN 100:

- **Computing**: Solid Modeling/CAD (SolidWorks), PowerPoint (multimedia presentations), Matlab.

- **Internet Skills**: Creating a website, archiving design reports on the web servers.

- **Graphics**: multi-view, isometric, and oblique drawing; scales, dimensioning, section, working drawings, sketching and solid modeling.

- **Lab skills**: experimental methods, data acquisition and analysis, prototype building and testing.

- **Design Methods**: customer needs assessments, concept generation, design selection matrices, safety, cost effectiveness, presentations, teamwork, ethics.

Class Policies

The following are ground rules to help us maintain a steady progress through the semester:

- **Attendance**
  - Attendance will not be taken on regular basis, however, students are expected to attend all classes.
  - Lab attendance is mandatory. If you miss a lab, you will receive a zero for that lab experiment.

- **Assignments and Reports**
  - Assignments are mix of writing, projects, and oral presentations.
  - Throughout this course, you need to follow the Design Process and Report guidelines.
  - Assignments will be posted on Canvas (https://canvas.psu.edu) on weekly basis.
  - Assignments are due at the start of the class before the lecture begins. Late assignments will not be accepted.
  - Lab experiments will be completed during one lab session and the lab report will be due the following week at the beginning of the lab period.
  - Make up exams/homework are only permitted for extreme cases and must be supported by written documentation, such as a doctor’s note.
  - It is the student’s responsibility to get any missing notes or assignments. If you miss a class, make sure to contact me or some one else in class to get important information that you might have missed.
  - Assignment papers must be clean, easy to follow and stapled. Do not fold or rip from a spiral notebook.
  - Students are encouraged to work in groups to study. However, you have to submit your own original work.
• **General Conduct**

  – Upon completion of your laboratory assignment, you will be expected to clean up your lab bench, put cables and other materials away, and turn off the instruments.
  
  – The computers provided in the laboratory are for use with the assignment and/or to access copies of the laboratory assignments. These computers are not to be used to “surf the net” or for any other purposes.
  
  – Food and drink are not allowed in the laboratory. Spills can lead to serious electrical shock and damage to equipment.
  
  – All phones and any other electronic devices must be turned off during the class session.
  
  – Courteous and mature behavior is expected. Inappropriate behavior towards other students or inappropriate comments will not be tolerated.

• **Contacts**

  – I will keep in touch with you over the course of the semester through e-mail. Please check your e-mail, frequently.
  
  – When sending me an email, make sure to use your PSU email account. I do not respond to emails from unidentified sources.
  
  – Feel free to send me any comment or thought about the course. I will be glad to hear from you.

**Grading System**

• There are no exams in this course. Your grade will depend on Homework assignments/lab reports and the final design project. Grades will be distributed as follows:

  – All Homeworks 60%
  – Design Project 40%

• Final letter grade will be assigned as follows:

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<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>A</td>
<td>94 – 100</td>
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<tr>
<td>A-</td>
<td>90 – 93</td>
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<tr>
<td>B+</td>
<td>87 – 89</td>
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<tr>
<td>B</td>
<td>83 – 86</td>
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<tr>
<td>B-</td>
<td>80 – 82</td>
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<tr>
<td>C+</td>
<td>75 – 79</td>
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<tr>
<td>C</td>
<td>70 – 74</td>
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<tr>
<td>D</td>
<td>60 – 69</td>
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<td>F</td>
<td>below 60</td>
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**Academic Integrity:**

All students are expected to act with civility, personal integrity; respect other students’ dignity, rights and property; and help create and maintain an environment in which all can succeed through the fruits of their own efforts. An environment of academic integrity is requisite to respect for self and others and a civil community.

Academic integrity includes a commitment to not engage in or tolerate acts of falsification, misrepresentation or deception. Such acts of dishonesty include cheating or copying, plagiarizing, submitting another persons’ work as one’s own, using Internet sources without citation, fabricating field data or citations, ”ghosting” (taking or having another student take an exam), stealing examinations, tampering with the academic work of another student, facilitating other students’ acts of academic dishonesty, etc.

Students charged with a breach of academic integrity will receive due process and, if the charge is found valid, academic sanctions may range, depending on the severity of the offense, from F for the assignment to F for the course. The University’s statement on academic integrity, from which the above statement is drawn, is available at [http://undergrad.psu.edu/aappm/G-9-academic-integrity.html](http://undergrad.psu.edu/aappm/G-9-academic-integrity.html)

**Services for Students with Disabilities:**

Penn State welcomes students with disabilities into the University’s educational programs. If you have a disability-related need for reasonable academic adjustments in this course, contact the Disability Coordinator, Kendra Sites, located on the first floor of the General Studies Building in the Student Success Center. She can be reached at 749-6045 or kmw24@psu.edu. For further information regarding the Penn State Student Disability Resources, please visit their web site at [www.equity.psu.edu/ods/](http://www.equity.psu.edu/ods/). Instructors should be notified as early in the semester as possible regarding the need for reasonable academic adjustments.

**Counseling and Psychological Services:**

Many students at Penn State face personal challenges or have psychological needs that may interfere with their academic progress, social development, or emotional wellbeing. The university offers a variety of confidential services to help you through difficult times, including individual and group counseling, crisis intervention, consultations, online chats, and mental health screenings. These services are provided by staff that welcome all students and embrace a philosophy respectful of clients cultural and religious backgrounds, and sensitive to differences in race, ability, gender identity and sexual orientation. Counseling Services at Mont Alto in 104 Conklin Hall Phone: 717-749-6125 or drp16@psu.edu (Darlene Pasi) Penn State Crisis Line (24 hours/7 days/week): 877-229-6400 Crisis Text Line (24 hours/7 days/week): Text LIONS to 741741

**Educational Equity and Report Bias:**

Penn State takes great pride to foster a diverse and inclusive environment for students, faculty, and staff. Acts of intolerance, discrimination, or harassment due to age, ancestry, color, disability, gender, gender identity, national origin, race, religious belief, sexual orientation, or veteran status are not tolerated and can be reported through Educational Equity via the Report Bias webpage [http://equity.psu.edu/reportbias](http://equity.psu.edu/reportbias).
## Schedule

The table below shows the topics covered on weekly basis.

| Week 1 | Introduction to Using Technology at PSU.  
|        | Introduction to Library Search |
| Week 2 | Web Page Design |
| Week 3 | Web Page Design (continue)  
|        | Introduction to Matlab |
| Week 4 | Introduction to Matlab (continue)  
|        | Data analysis |
| Week 5 | Introduction to Electric Circuits |
| Week 6 | Lab 1: Elementary Measurements.  
|        | Mechanical Behavior of Engineering Material |
| Week 7 | Lab 2: Strain Gage Applications  
|        | Lab 3: Building a Wheatstone Bridge Circuit |
| Week 8 | Lab 4: Designing and Building a Prototype  
|        | Design Documentation, Presentation, and Evaluation  
|        | Introducing Final Design Project |
| Week 9 | Engineering Graphics  
|        | Freehand sketching |
| Week 10 | Computer-Aided Design and Drafting (CAD)  
|        | Modeling Parts in SolidWorks |
| Week 11 | Modeling Parts in SolidWorks (continue)  
|        | Creating a working Drawings |
| Week 12 | Creating a working Drawings (continue) |
| Week 13 | Final Design Project |
| Week 14 | Final Design Project and Presentation |