ENS 209-A (20746)
Introduction to Computer Aided Drafting and Solid Modeling
Spring 2023 – 2024 (202302)

Lecture Time and Location:  
Monday 09:40-11:30 (FENS G035)  
Wednesday 16:40-17:30 (FENS G032)

Section A:  
(TA: Atakan Alkan)  
LAB: (20749)  
Fri 09:40-11:30 (FENS L065)  
REC: (20760)  
Fri 11:40-12:30 (FENS L065)

Section B:  
(TA: Ali Rashed)  
LAB: (22019)  
Fri 14:40-16:30 (FENS L027)  
REC: (20762)  
Fri 16:40-17:30 (FENS L027)

Instructor:  
Utku Seven, Ph.D.

Office: FENS L017  
e-mail: useven@sabanciuniv.edu or utku.seven@sabanciuniv.edu  
Office hours: WED 13:40-15:30  
Tel: 9595

Teaching Assistants/Office Hours (contact your TA for location or appointment):  
Atakan Alkan (atakan.alkan@sabanciuniv.edu) Office Hour (TBA TBA@TBA)  
Ali Rashed (rashed@sabanciuniv.edu) Office Hour (TBA TBA@TBA)

Grading Assistants/Office Hours (contact your TA for location or appointment):  
Atakan Alkan (atakan.alkan@sabanciuniv.edu) Office Hour (TBA TBA@TBA)  
Ali Rashed (rashed@sabanciuniv.edu) Office Hour (TBA TBA@TBA)

Course Book:  
Purchase link: https://www.homerbooks.com/urun/technical-drawing-with-engineering-graphics

Supplementary References:  
Catalog Description:
ENS 209 is concerned with the basic and important principles in computer-aided drafting and design (CADD), and 3D solid modeling. Based on an understanding of engineering drawing, the course will further introduce the use of computers for 2D drafting and 3D solid modeling. Topics include engineering drawing, tolerances, computer-aided technical drafting and design, geometric models and data structures, representation and manipulation of curves and surfaces and 3D solid modeling, and assembly modeling and analysis. Engineering materials, mechanical parts and manufacturing methods.

Objective of the course (Course Learning Outcomes):
At the conclusion of this course, you should be able to:
- Describe the design process and product life cycle,
- Describe the advantages of using computers in design process,
- Identify different technical drawings based on the projection system used,
- Sketch the different views of a given 3D component,
- Interpret drawings that include section views,
- Assign dimensions and tolerances on the views correctly (properly),
- Represent and manipulate free-form curves and surfaces,
- Understand and draw sections and cutting planes,
- Use conventional and geometric dimensions and tolerance to describe size, shape and geometric tolerances accurately on an engineering drawing,
- Model 3D objects using solid modeling techniques,
- Identify and apply dimensioning guidelines,
- Interpret a technical drawing,
- Develop assembly drawings using constraints,
- Design for Assembly and Manufacturing (Design for X),
- Work with a CAD software (Solidworks) to design an assembly and generate technical drawings of its components and assembly drawings,
- Work effectively in a team to analyze a product (assembly) to dissect and design it by using a CAD software.

Policies and Procedures:
- **Homepage:** [https://sucourse.sabanciuniv.edu/plus](https://sucourse.sabanciuniv.edu/plus) We will be using SUCourse+ which is a MOODLE based course management system. The outline of lecture notes, assignments, projects and other course material will be posted on SUCourse+.
- **Lecture Hours:** Lecture Hours will be held IN-CLASS. Participation policies will be announced during the first lecture hour.
- **Laboratory Hours:** Laboratory Hours will be held IN-CLASS. Attendance will be taken.
- **Recitation Hours:** Recitation Hours will be held IN-CLASS.
- **Midterm Exams:** There will be IN-CLASS midterm exams (progressive) during the semester. The midterm exams will be on April 5th and May 10th from 19:40 to 22:00. The questions in the exams will not be same as the solved example questions.
- **Final Exam:** Final Exam will be held as an IN-CLASS exam. It will be provided during the final exam weeks. Final exam date will be assigned and announced by the faculty.
- **Assignments:** Homework assignments will be assigned regularly.
- **Quizzes:** Quizzes will be held during Recitation and Lecture hours. No late submissions will be accepted!!!
- **There will not be any extra-credit or assignments other than assigned.**
- **Missed Exams:** No excuses for missed exams will be accepted other than certified medical excuses from the campus health center or permission papers approved by the university’s president. A single comprehensive make-up exam will be offered after or before the final exam. Make-up exam can replace ONE missed exam only.
- **Projects:** There will be a semester-project and groups of four will be formed to work on the projects. The details of the project will be provided in coming weeks.
- **Individual effort:** Any academic dishonesty (i.e. cheating, plagiarism...) shall be resolved according to the University’s Academic Integrity Policy. Any academic dishonesty such as cheating, plagiarism or unauthorized sharing will result in an “F” Grade in the course and/or disciplinary actions.
- **Team effort:** Teams will periodically be asked to submit individual effort assessment. Teams having problem working together should make every effort to resolve them by themselves. If that doesn’t work, contact the instructor for help.

ENS 209, 202302 (Utku Seven) 2 / 3
• **Objections to grading:** If there is any objection to grading, the student must inform the instructor via an e-mail after grades are released. The students must clearly explain why he/she deserves the missed credit(s).

• **Attendance:** Formal roll may be held on an occasional basis during the Lectures. Attendance to Laboratory & Recitation hours is compulsory and final grade will be highly affected by Laboratory & Recitation Attendance. **If you do not satisfy 70% of attendance either in Laboratory or Recitation hours without any excuse, you’ll get “NA”**. For this semester, you will **FAIL** the course if you miss 5 days. Laboratory Attendance will be taken by using your weekly submissions.

• **Computer usage:** You are expected and supposed to do CAD assignments, quizzes, project etc. on your own computer unless any prior approval of the instructor is given. Otherwise, you will get “0” from CAD assignments. **Your laptops will be registered by your TAs during the laboratory hours.**

• **Final Exam:** If your Final Exam grade is below **25** points, you will directly get “F”.

• **Lab Final Exam:** Lab Final Exam effects the overall grade with 10% weight.

• **Course grade:** A weighted-average grade will be calculated, and letter grades will be assigned to the overall grades.

• **Time conflict override:** If you are registered to the course by time conflict override, you are the one who is responsible of any inconvenience regarding attendance, any missed lecture content, quiz etc.

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**Tentative Grade Distribution for the course is as follows:**

<table>
<thead>
<tr>
<th>Assignments + Quizzes</th>
<th>10%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midterm Exams (IN-CLASS)</td>
<td>20% x 2</td>
</tr>
<tr>
<td>Project</td>
<td>15%</td>
</tr>
<tr>
<td>Final Exam (IN-CLASS)</td>
<td>25%</td>
</tr>
<tr>
<td>Lab Final Exam</td>
<td>10%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

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**Tentative Schedule**

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Week</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction, Product development</td>
<td>8</td>
<td>Dimensioning and Tolerancing</td>
</tr>
<tr>
<td>2</td>
<td>Layouts, Technical Sketching</td>
<td>9</td>
<td>Geometric Dimensioning and Tolerancing (GD&amp;T)</td>
</tr>
<tr>
<td>3</td>
<td>Geometric construction, Projections</td>
<td>10</td>
<td>Assembly Modeling (Assembly Mates)</td>
</tr>
<tr>
<td>4</td>
<td>Representation and manipulation of curves and surfaces</td>
<td>11</td>
<td>Assembly Modeling (Mechanical Parts)</td>
</tr>
<tr>
<td>5</td>
<td>Solid modeling</td>
<td>12</td>
<td>Design for Assembly, Manufacturing etc.</td>
</tr>
<tr>
<td>6</td>
<td>2D representations</td>
<td>13</td>
<td>Engineering Materials</td>
</tr>
<tr>
<td>7</td>
<td>Sections, Auxiliary views</td>
<td>14</td>
<td>Manufacturing Methods</td>
</tr>
</tbody>
</table>