

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)

<b>LAB:</b> (20749)	<b>Fri 09:40-11:30</b>	<b>(FENS L065)</b>
<b>REC:</b> (20760)	<b>Fri 11:40-12:30</b>	<b>(FENS L065)</b>

**Section B:**  
(TA: Ali Rashed)

<b>LAB:</b> (22019)	<b>Fri 14:40-16:30</b>	<b>(FENS L027)</b>
<b>REC:</b> (20762)	<b>Fri 16:40-17:30</b>	<b>(FENS L027)</b>

**Instructor:**  
Utku Seven, Ph.D.

**Office:** FENS L017  
**e-mail:** [useven@sabanciuniv.edu](mailto:useven@sabanciuniv.edu) or [utku.seven@sabanciuniv.edu](mailto: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	<a href="mailto:atakan.alkan@sabanciuniv.edu">(atakan.alkan@sabanciuniv.edu)</a>	Office Hour ( <b>TUE</b> 17:00-19:00@ZOOM)
Ali Rashed	<a href="mailto:rashed@sabanciuniv.edu">(rashed@sabanciuniv.edu)</a>	Office Hour ( <b>FRI</b> 12:30-14:30@ZOOM)

**Grading Assistants/Office Hours (contact your TA for location or appointment):**

Atakan Alkan	<a href="mailto:atakan.alkan@sabanciuniv.edu">(atakan.alkan@sabanciuniv.edu)</a>	Office Hour ( <b>TUE</b> 17:00-19:00@ZOOM)
Ali Rashed	<a href="mailto:rashed@sabanciuniv.edu">(rashed@sabanciuniv.edu)</a>	Office Hour ( <b>FRI</b> 12:30-14:30@ZOOM)

**Course Book:**

- Technical Drawing with Engineering Graphics, 14/E by Giesecke, Hill, Spencer, Mitchell, Dygdon, Novak, Lockhart & Goodman, Prentice Hall, ISBN-10: 0135090490.

**Purchase link:** <https://www.homerbooks.com/urun/technical-drawing-with-engineering-graphics>

**Supplementary References:**

- Engineering Design Graphics with Solidworks 2019, 1/e by Bethune, Prentice Hall, ISBN-10: 0135401755
- Principles of CAD/CAM/CAE, 1/e by Lee, Prentice Hall, ISBN-10: 0201380366

### 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> 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 6<sup>th</sup> 12:00 - 14:00** and **May 18<sup>th</sup> 12:30 - 14:30**. **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.

- **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.**

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

Assignments + Quizzes	10%
Midterm Exams (IN-CLASS)	20% x 2
Project	15%
Final Exam (IN-CLASS)	25%
Lab Final Exam	10%
-----	
Total	100%

**Tentative Schedule**

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