

# INTRODUCTION TO ENGINEERING

ENGR 100A – Section 46058  
Santa Ana College  
Department of Engineering  
Fall 2024

Lectures: Thursday, 4:20 – 7:30 pm Room SC-134  
Units: 3  
Instructor: Craig Takahashi, Ph.D. takahashi\_craig@sac.edu  
Office/office hours: provided in class

## Description:

The course explores the branches of engineering, the functions of an engineer, and the industries in which engineers work. Explains the engineering education pathways and explores effective strategies for students to reach their full academic potential. Presents an introduction to the methods and tools of engineering problem solving and design including the interface of the engineer with society and engineering ethics. Develops communication skills pertinent to the engineering profession.

## Student Learning Outcomes

Students will be able to: (1) demonstrate knowledge & skills necessary to select and develop engineering careers, (2) demonstrate ability to complete a project as part of a design team.

## Textbook & Materials

1. Studying Engineering: A Road Map to a Rewarding Career, Raymond B. Landis, Discovery Press, 3<sup>rd</sup> Edition, 2007 (~\$20) (Optional)
2. Scientific calculator (calculator software on computers or cell phones are fine), USB flash drive
3. Materials for design projects – (1) Arduino kit (~\$36), (2) ME kit (~\$30 - \$60, or more). You may spend more if you like but this is not required.

## Grading

Grading is determined on a percentage system, not on a curve. Note – I do not GIVE out grades, you EARN them! Grading is based on mathematical computation, not by my manipulation or your life circumstances. A final score within 0.5% of the next higher grade is rounded up (e.g., 79.50% = B; 79.49% = C). A final score within 1.00-0.51% of the next higher grade, will round up to the next grade (e.g., 79.0 to 79.49% gets a B) ONLY IF the student does not “miss” (i.e., score < 50%) on more than 1 assignment for the whole semester. NO score > 1% from the next higher grade will round up (e.g., 78.9999 gets a C no matter what).

Grading Scale	Weighting of grades
A = 90 – 100%	Homework 35%
B = 80-89%      D = 60-69%	Exams 30%
C = 70-79%      F < 60%	Projects 35%

## Tentative Schedule (FALL)

Wk	Date	Topic	Wk	Date	Topic
1	8/22	Administrative & Intro, Syllabus	9	10/17	<b>Exam 3</b> , EE Proj, Trig Lab – EE Project Hw 7 due - unit conversion
2	8/29	Engineering Profession Lab/tech – bridge design intro Lab – start CE	10	10/24	ME (Mechanical E), ME Project <b>EE Project Due</b> Lab – start ME project Hw 8– EE cales, unit conv 2
3	9/5	<b>Exam 1</b> , Design & AutoCAD Lab – AutoCAD, CE Project Hw 1 due - Syllabus Qs	11	10/31	ME Project Calculations Lab – ME project Hw 9 due - ME Proj Qs
4	9/12	Bridge Project Calcs Lab – CE Proj Hw 2 due - CE Project Qs	12	11/7	<b>Exam 4</b> , Solidworks Lab – ME project
5	9/19	Civil Engineering (CE) Lab – CE project Hw 3 due – Schedule	13	11/14	Engr Education Personal Growth, Learning AND Other Branches of Engr Lab - ME project Hw 10 due - 3D model
6	9/26	<b>Exam 2</b> , EE & EE Project Lab – CE Project Hw 4 due – Arduino kit	14	11/21	Pursuing Engr / SAC Progs Lab – ME project Hw 11 due –
7	10/3	<b>CE Project Due</b> Lab - CE project presentations Hw 5 due – 2D CAD Drawing	15	11/28	<b>HOLIDAY –Thanksgiving</b>
8	10/10	(Open Day - guest speaker?) Lab – EE Project Hw 6 due - EE Project Qs	16	12/5	<b>ME Project Due, Exam 5</b>

## Online Communication

Students must be capable of electronic communication.

Course Website - most course items are posted on a course website (provided in class), NOT Canvas.

Canvas - students must know Canvas ([rscd.instructure.com/login/ldap](https://rscd.instructure.com/login/ldap)), a web based course management software. Contact Distance Education (714-564-6725, Room A-101, [sac\\_disted@sac.edu](mailto:sac_disted@sac.edu)) for Canvas issues. Canvas is mainly used to post grades & may possibly be used submit work, and conduct exams for some classes (except for transfer classes like 235, 240, 250 where exams are written on paper). Canvas utilization is subject to change based on instructor discretion.

Email – I regularly send class-wide emails using email addresses from the SAC enrollment system (Self Service), not Canvas, so you **MUST** have a valid email on this system. Students who miss emails (e.g., don't check them or have incorrect/inactive email on SAC system) must obtain the information from classmates.

When emailing me, always indicate which class you are in (E.g. Engr 235). If you change your email address in SAC enrollment system, notify me by email, indicating the class of mine you are in.

It is YOUR responsibility to check Canvas, the course website, and email regularly.

### Assessments:

- *Assignments* – include homework (hw), labs, projects, etc. Submissions may be in class (due at start of class) or via Canvas (due as specified on Canvas). The instructor will inform you which to submission to use. Late work receives no credit. Label paper submissions in the upper right of the front sheet with student first & last name, course #, & hw # (e.g., John Doe, Engr 100A, hw #1), except in **DRAFTING** classes (122, 125) where your name must appear in the title block of each sheet. Paper submissions must be written on WHITE COPY PAPER. Digital notes (eg - One Note) must use plain white background and black writing. Engineering paper, graph or heavy lined paper is not acceptable as it is hard to see your work. Work must be submitted with problems in the order assigned and with upright orientation or points will be deducted. The lowest assignment score will be dropped (Canvas drops the lowest grade automatically from day one). Emailed work and work attached in comments on Canvas are not accepted. Canvas submissions must meet requirements discussed in class.
- *Exams* - (**5 exams**) exams must be taken during the allotted time (not before, not after). There are NO make-up exams. Instead lowest exam score is dropped. Exams must be taken in class.
- *Projects* – (see tentative schedule) - NO late projects!
- *Lab work, conduct, safety* – (applicable to classes with a lab or hands-on activities) lab work is related to completion of hands-on exercises. Part of your lab grade is "lab conduct", which is based on how well students clean up, stay organized, and maintain lab safety. Lab safety is critical in a lab environment & it is part of your grade. Safety procedures handouts will be provided. Students must pass a safety exam prior to using the lab. Students must report any safety infractions by submitting a mandatory incident report to the instructor. Students who fail to report or who have repeated incidents may lose their lab privileges. Students who do not demonstrate the ability to work safely in lab may be restricted from using equipment and tools as determined by the instructor. All fabricated parts must have instructor pre-approval. Inappropriate items (weapons parts, offensive items, etc.) are prohibited.

### Course policy and conduct

- *Academic Honesty* – students are encouraged to communicate with classmates about course concepts (e.g., study groups) but may only turn in their own work. Graded work (assignment, exam, etc.) deemed plagiarized or copied receives a score of 0 (for both the copier and the one who allowed the copying). More generally, academic honesty policy of this course, including any resulting disciplinary action, is per the college catalog.
- *Grading* – students may challenge a grade on a graded work by submitting a "grade review" request using the following procedure: *Type* the request with a cover sheet having your full name, student number, date, description of the work in question, detailed explanation of why you feel the grade was incorrect, and a rationale for a higher score (using sketches or drawings if necessary). Submit the request within 1 week of the work being returned (except work in the last week of class, where it must be submitted within 2 days). A review evaluates the *entire* assignment, not just the questionable issue. Thus, the review may result in a lower overall score. Grades incorrectly entered on Canvas do not require a review, but inform me within 7 days of the grade posting (show or email a picture of the grade on the work).
- *Attendance/absences* – the instructor has the authority to drop any student for excessive absence as defined in the college catalog. Class meetings missed prior to adding class are also considered absences. Attendance is based on when the instructor takes roll, but it also requires student presence for the entire

class. Students are considered absent if they arrive late, leave early, or disappear in-between. Students who miss class must obtain any missed material from a classmate.

- *Lack of participation drop & grade policy* – the instructor has the authority to drop students for lack of participation per the college catalog. Participation means turning in graded assignments & taking exams. Graded work scoring < 50% is considered "missed." Attending class alone is not participation.
- *Withdraws* –students are responsible for dropping themselves from courses they no longer wish to complete. Withdraw policies, including withdraw deadlines, are specified in the college catalog. Dropped students may be reinstated at the instructor's discretion.
- *Student with Disabilities* – students requesting academic accommodations for a verifiable disability must first be evaluated by Disabled Student Programs & Services (DSPS; x6260, 6384 TDD for deaf students, U103) for authorization, and the student must inform the instructor within the first 2 weeks of class.
- *Cell Phones or Technology* – Silence cell phones. Disruptive students may be removed from class. Students may not make recordings (e.g., audio or video with a cell phone) in the classroom without prior instructor approval.
- *Food* – students may not bring food or drink into the classrooms. Water in a closable container is okay.
- *Other* – any student claims about something I verbally "allowed" (e.g., "you said there was no hw", "you said I could miss most of the lecture", etc.) must be substantiated with some type of verifiable documentation (e.g. – email from me). If it isn't documented, it didn't happen. Missed work gets a 0. Under extreme circumstances the instructor may at his discretion "not count" missed work if student provides documentation.
- *Digital submissions* – some work may be submitted digitally. Students must have the ability to produce digital documents (usually jpg or pdf, and for videos, mp4) and upload those to Canvas. The instructor will provide further details on the rules for submitting work on Canvas.
- *Illness procedures* – please do not come to class if you are sick (covid or any other respiratory illness). The instructor will try work with you to figure out how to accommodate lost class time due to illness. Cover coughs and sneezes. Please wear a mask & try to maintain social distance from other people.

**Engineering Dept Mission Statement:** Santa Ana College engineering department prepares students for university transfer or employment in engineering and engineering-related fields.

**SAC Mission Statement:** Santa Ana College inspires, transforms, and empowers a diverse community of learners.