San Francisco State University

School of Engineering

ENGR 100: Introduction to Engineering

Bulletin Description

ENGR 100: Introduction to Engineering (1 unit)

Description of the major engineering fields and their subfields. Day to day activities of engineers. Engineering professionalism, ethics, communication skills, lifelong learning and career planning. Survival skills. Safety issues and School of Engineering policies.

Prerequisites

High school algebra and trigonometry

Specific Learning Outcomes

- Students gain a basic understanding of engineering fields and their connection to real-world applications and job opportunities
- Students learn about the degree requirements and the expected coursework
- Students learn about the engineering fields by searching for information from various resources. Students demonstrate the ability to summarize and present an idea
- Students gain hands-on engineering experience
- Students learn about emerging technologies and trends in the engineering fields
- Student gain awareness of resources and opportunities for their study and career development

Instructors

- Dr. Xiaorong Zhang (Computer Engineering; Email: xrzhang@sfsu.edu; Office: SCI 213D)
- Dr. Mohammad Haji Aboli (Electrical Engineering; Email: mhaji@sfsu.edu; Office: SCI 112-A)
- Dr. Yarra Siddaiah (Civil Engineering; Email: syarra@sfsu.edu; Office: SCI 112)
- Dr. George Anwar (Mechanical Engineering; Email: ganwar@integratedmotions.com; Office:)

Course Material

No textbook is required. All lecture slides, supplementary materials, and assignments will be posted on iLearn (https://ilearn.sfsu.edu).

Class Schedule

Section	ENGR 100-01	ENGR 100-02	ENGR 100-03	ENGR 100-04
Location	SCI 256	SCI 166	SCI 256	SCI 166
Time	Fri 9:30-12:15pm	Fri 9:30-12:15pm	Fri 12:30-3:15pm	Fri 12:30-3:15pm
31-Jan	Zhang	Haji Aboli	Yarra	Anwar
7-Feb	Zhang	Haji Aboli	Yarra	Anwar
14-Feb	Zhang	Haji Aboli	Yarra	Anwar
21-Feb	Zhang	Haji Aboli	Yarra	Anwar
28-Feb	Haji Aboli	Zhang	Anwar	Yarra
6-Mar	Haji Aboli	Zhang	Anwar	Yarra
13-Mar	Haji Aboli	Zhang	Anwar	Yarra
20-Mar	Haji Aboli	Zhang	Anwar	Yarra
27-Mar	Spring Break			
3-Apr	Yarra	Anwar	Zhang	Haji Aboli
10-Apr	Yarra	Anwar	Zhang	Haji Aboli
17-Apr	Yarra	Anwar	Zhang	Haji Aboli
24-Apr	Anwar	Yarra	Haji Aboli	Zhang
1-May	Anwar	Yarra	Haji Aboli	Zhang
8-May	Anwar	Yarra	Haji Aboli	Zhang
15-May	Anwar	Yarra	Haji Aboli	Zhang

Topics to be Covered

- Computer Engineering:
    - Introduction to computer engineering, its subfields, and their applications
    - Overview of Computer Engineering major and minor curriculum
    - Introduction to computers, including basic computer architecture, software and hardware, network, etc.
    - Introduction to emerging computer engineering fields including artificial intelligence, Internet-of-Things, human-machine interfaces, etc.
    - Computer engineering career and opportunities; resources and communities

- Civil Engineering:
  - Introduction to Civil Engineering Presentation
  - Review of the CE Curriculum and Requirements
  - Tour of the CE Labs
  - Structural/Earthquake Engineering Presentation - Examples of Related Projects
  - Project Management/ Construction Engineering Presentation
  - Transportation Engineering Presentation – Examples of Related Projects
  - Geotechnical Engineering Presentation - Examples of Related Projects
  - Environmental Engineering Presentation - Examples of Related Projects
- Mechanical Engineering:
  - Introduction to Mechanical Engineering Discipline & Areas
  - Introduction to ME Program & Curriculum
  - Introduce ME Labs and Student Resources
  - Assignment of ME example problem
  - Team Challenge - ME Design Project
  - Team Challenge - ME Build Project
- Electrical Engineering
  - Introduction to electrical engineering, its relation to science and mathematics
  - Lectures on topics from various major fields of work in electrical engineering includes
    - *Electrical Power Systems*
      - Characteristics of industrial and residential consumption/load
      - The concept of power-factor correction and the use of the capacitor reactors
    - *Information and Communication Systems*
      - Common features in all coding systems, from Morse-code to today's advanced coding ones
      - Examples of implemented communication systems in Simulink to highlight the impact of noise and signal power of bit error rate
    - *Signal and image processing*
      - Showcases demonstrations of the concepts such as noise filtering
      - Image formation in digital camera (CCD/CMOS) sensors. Bayer filter for color imaging using single image sensor systems (i.e. Demosaicing)
    - *Integrated circuits (tentative depends on time)*
      - A historical background
      - Challenges related to the cost and yield factor (Moore's Law)
      - The current trend of gate size (i.e. nano-sized technologies) and its relation to the operational speed of the circuits. Power consumption and cost

Important Dates

ADD/DROP/AUDIT deadline (for students) (ADD with permission numbers)	Feb. 14 (F)
Withdrawal (serious & compelling reasons)	Feb. 15 (S) – Apr. 27 (M)

Withdrawal (serious & compelling/plus documentation)	Apr. 28 (T) – May 14 (Th)
Instruction ends	May 15 (F)
Spring Recess (no classes/offices open)	Mar. 23 (M) – Mar. 28 (S)

Grading Policy:

Grades will be based on total points earned through the following activities:

Civil engineering activities/assignments	25%
Computer engineering activities/assignments	25%
Electrical engineering activities/assignments	25%
Mechanical engineering activities/assignments	25%
Total	100%

Grade assignment:

A from 100 to 94	A- from 93 to 90	
B+ from 89 to 87	B from 86 to 84	B- from 83 to 80
C+ from 79 to 77	C from 76 to 74	C- from 73 to 70
D+ from 69 to 67	D from 66 to 64	D- from 63 to 60
F below 60		

Policies on Plagiarism

Plagiarism is defined as using someone else's ideas or work as one's own without giving proper credit to the source. The source includes public (books, journals, magazines, newspapers, internet, etc.) as well as private (unpublished reports, internal documents, personal work, etc.) materials. The instructor will not accept excuses such as "I forgot to give credit to …," "It's an oversight," or "It's a clerical error."

Students are solely responsible for materials submitted for the course so "My roommate must have done that without my knowledge" is not an acceptable excuse either. That is, no excuses will be accepted if plagiarism is discovered. If a submitted work is found to contain plagiarized material, the work will receive zero credit and the student may be reported to the Student Judiciary Affairs for disciplinary actions. Cheating on tests will also be reported to the Student Judiciary Affairs. Disciplinary actions may include disqualification from the university.

Disability Access

Students with disabilities who need reasonable accommodations are encouraged to contact the instructor. The Disability Programs and Resource Center (DPRC) is available to facilitate the reasonable accommodations process. The DPRC is located in the Student Service Building and can be reached by telephone (voice/415-338-2472, video phone/415-335-7210) or by email (dprc@sfsu.edu).

Student Disclosures of Sexual Violence

SF State fosters a campus free of sexual violence including sexual harassment, domestic violence, dating violence, stalking, and/or any form of sex or gender discrimination. If you disclose a personal experience as an SF State student, the course instructor is required to notify the Title IX Coordinator by completing the report form available at http://titleix.sfsu.edu, emailing vpsaem@sfsu.edu or calling 338-2032.

To disclose any such violence confidentially, contact:

- The SAFE Place - (415) 338-2208; http://www.sfsu.edu/~safe_plc/
- Counseling and Psychological Services Center - (415) 338-2208; http://psyservs.sfsu.edu/
- For more information on your rights and available resources: http://titleix.sfsu.edu

Policy on observance of religious holidays

If a student wishes to observe religious holidays and such observances require the student to be absent from class activities, it is the responsibility of the student to inform the instructor, in writing, about such holidays during the first two weeks of the class each semester. If such holidays occur during the first two weeks of the semester, the student must notify the instructor, in writing, at least three days before the date that he/she will be absent. Please check http://www.interfaithcalendar.org/ for world religious days.