Message from the Director

Computer Engineering continues to be one of the most marketable degrees and with some of the best salaries. In fact, Computer Engineers are in the best position to help solve some of our society’s most pressing problems by designing novel systems with emerging technologies.

The CE Undergraduate Program at UCSB starts with a foundation of hardware and software fundamentals and extends that foundation with advanced elective sequences. Students then bring all this knowledge together in a Senior Computer Systems Project sequence (ECE or CS 198) that culminates in a final presentation event.

Our website was created with the student in mind. We wanted prospective and current students to have access to a Freshmen to Senior Year Timeline & Advising Information and CE’s curriculum including the 4-Year Course Plan, Senior Elective Sequences, and the Senior Capstone Project.

If students would like to move on, Graduate degrees for current CE undergraduate students are offered with the BS/MS option or incoming students can pursue a CE-focused degree from either the ECE or CS departments.

We’re sure you will find what you need on our website. If you don’t, feel free to call us at 805/893-5685 or email usinfo@ece.ucsb.edu.

We look forward to the 2021-22 academic year — Li-C. Yang, Director, CE Program
Overview

Computer Engineering Program

ECE
Electrical & Computer Engineering Department

CE
COMPUTER ENGINEERING PROGRAM
Jointly offered by the Computer Science and Electrical & Computer Engineering Departments

CMPSC
Computer Science Department

Processes, Tools, and Products

Problems that need solutions

www.ce.ucsb.edu

Curriculum

• Solid Foundation in the Basic Sciences and Fundamentals
• Specialized Senior Elective Sequences:
  • Computer Networks
  • Computer Systems Design
  • Design & Test Automation
  • Distributed Systems
  • Machine Learning
  • Multimedia
  • Programming Languages
  • Real-Time Computing & Control
  • Robotics
  • Signals & Systems
  • System Software Architecture
  • Very Large Scale Integration (VLSI)
  (a sequence contains 2-3 classes)

• Senior “Capstone” Project

www.ce.ucsb.edu
Degree Options

Four-Year B.S. Degree
Freshman – 51 units ~ Sophomore - 53 units ~ Junior – 44 units ~ Senior – 43 units

Five-Year Combined B.S./M.S. Degrees

- An additional year of specialization in either CMPSC or ECE Master’s Degree Programs
- Obtain both a B.S. and a M.S. degree in about five years
- Take graduate level courses in the last half of the Senior year
- Apply at the end of the Junior year

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ECE & CS 189 Senior Capstone Projects

During the senior year, ECE students are required to take the Senior Computer Systems Project courses also known as the Senior “Capstone” Project. This course helps satisfy CE Major Degree Requirements in the Senior Elective Study Plan.

The Capstone Project gives CE students the opportunity to put their education into practice. Students, working in small teams, design and engineer innovative hardware and software systems using techniques from robotics, distributed systems, circuit design, networking, and real-time systems to solve problems and create a final “marketable” project.

Every year at the end of the fall quarter the projects are presented at full-day, industry-sponsored events where student groups publicly present their projects and participate in a project demonstration and poster event.

2020-21 Capstone Design Projects

- **Anchorless** (Coast Lab): aims to remove the buoy’s reliance on an anchor by designing a system that autonomously repositions the buoy within a designated zone
- **BlueFinder** (CACI/LGS Labs): identifies and locates local Bluetooth devices using XTRX software-defined radios and direction finding algorithms
- **CAT** (Alcon TrueVision): an object detection system that prevents a robotic arm from collisions in the operating theater
- **Project Argus** (NASA): a standardized and autonomous tracking solution for maintenance and assembly procedures
- **Pierra** (Aerovironment): a RADAR based system that enables collision avoidance and autonomous movement of drones at an extremely low cost
- **Seashield** (Navsea): a drone system that fights rust and corrosion with automated flight planning and application of a corrosion inhibiting liquid
- **Parkingbase** (Qualcomm, Laritech): a real-time parking tracker using a custom low-cost, long-lasting, wireless parking lot sensor
- **TRAC** (Aptitude, Laritech): a handheld device that uses a blood test for rapid detection of coagulopathy, a deadly condition that affects approximately a quarter of trauma patients
2020-21 Capstone Design Projects
CMPSC 189A/B

- O(MG) (Appfolio): Survey distribution and processing for managers to judge their team's cohesion
- STORKEAI (Invoca): Improve social experience for individuals with Autism Spectrum Disorder
- POWWOW++ (AGMonitor): Mobile app to help farms with water efficiency and fertigation issues
- SALT (Teladoc Health): Identify malpractice in the doctor's office
- ALPRO (Alcon/TrueVision): NGENUITY 3D Visualization Automation
- LOG (Well Health): Bridge the communication gap between patients and doctors
- TRANSFORM (QAD): Build a virtual assistant on top of the QAD ERP platform
- BINARY BROS (Novacoast): Discover phishing domains to protect users from accessing them
- RUNTIME TERROR (LogMeIn): Unique communication tool for the Special Olympics
- #STUB (Teladoc Health): Integrate health devices in telehealth settings

2020-2021 Project Awards

Best Computer Science 189 Projects:

- 1st Place – ALPRO (Alcon/TrueVision): Robot controller for eye surgery
- 2nd Place – SALT (Teladoc Health): Automated support for telemedicine consultations
- 3rd Place – BINARY BROS (Novacoast): Phishing attack prevention
2020-2021 Project Awards

Best ECE 189 Projects:

- **1st Place** – Pterra (Aerovironment): a RADAR based system that enables collision avoidance and autonomous movement of drones
- **2nd Place** – Parkingbase (Qualcomm, Laritech): a real-time parking tracker using a custom low-cost, wireless parking lot sensor
- **3rd Place** – TRAC (Aptitude, Laritech): a handheld device that uses a blood test for rapid detection of coagulopathy
- **Faculty Choice** – Project Argus (NASA): an autonomous tracking solution for maintenance and assembly procedures