

Electrical Engineering

Junior Meeting 2023
WELCOME!



Senior Elective Requirements

- ✓ 8 Courses and 32 units minimum
- ✓ EE Senior Capstone, ECE 188A-B-C is required (4 units each)
 - ECE 188A prerequisite is ECE 130A&B with a C- or better in both; *or* ECE 137A&B with a C- or better in both
- ✓ 1 Dept Approved Sequence
- 🌐 ✓ Approx. 4 (minimum 32 units total) single elective courses

Approval Process

- Discuss your senior elective plans with your faculty advisor and get course recommendations.
- Faculty Advisor must sign and approve your senior elective plans
- Email the signed form to ECE Student Office for final approval



Elective Sheets are Contracts

- 🌐 You **MUST** complete the required number of elective courses.
- 🌐 You do not have to list **ALL** electives you plan to take, just the required minimum (8 courses, 32 units minimum).
- 🌐 You are responsible for knowing the prerequisites of the courses.
- 🌐 **PLAN CAREFULLY!!**



2023-2024 EE Faculty Advisor Assignments

Last Name	Faculty Advisor	Faculty Email
A - D	https://www.ece.ucsb.edu/undergrad/current	
E - G	To be announced soon.	
H - J		
K - M		
N - Q		
R - V		
W - Z		

EE SENIOR ELECTIVE FORM



Electrical Engineering

Schedule of Senior EE Electives, 2016-17 & Later

Department of Electrical and Computer Engineering – University of California, Santa Barbara

Last Name, First Name

UCSB Email

Perm Number

Phone Number

STUDENTS ARE RESPONSIBLE FOR DETERMINING AND TAKING THE NECESSARY PREREQUISITES FOR THE CLASSES LISTED.

YOUR SENIOR ELECTIVES MUST INCLUDE:

- 1) A MINIMUM OF 32 UNITS;
- 2) A MINIMUM OF 8 COURSES;
- 3) EE SENIOR CAPSTONE PROJECT, ECE 188A-B-C (3 UNITS EACH, TOTAL OF 9 UNITS); AND ONE (1) ADDITIONAL SEQUENCE REQUIRED;
- 4) ADDITIONAL DEPARTMENTAL ELECTIVES OF YOUR CHOOSING.

	Course	Units
Capstone Senior Project		
Second Sequence		
Departmental Electives		
Total Units:		
Minimum Required:		32

Include all completed EE senior electives.

Student's Signature

Date

ECE Student Office Approval Signature

Date

Faculty Advisor's Signature

Date

Electrical Engineering Program Undergraduate Emphases

The ECE electives allow students to acquire more in-depth knowledge in one of several areas of specialization. Several possible tracks are illustrated below with recommendations for related electives. Note that these are NOT to be considered the only possibilities for electives. They are listed just to provide some guidance in choosing electives consistent with specific disciplines.

Course descriptions for many of these courses can be found in the General Engineering Academic Requirements (GEAR) <<https://engineering.ucsb.edu/undergraduate/academic-advising/gear-publications>>

Approved Departmental Electives

Computer Engineering

ECE122A-B
ECE 123
ECE150
ECE153A-B
ECE 154A-B

VLSI Design

ECE122AB
ECE153A-B
ECE157A-B

Control Systems/Robotics

ECE 130C
ECE 141A-B-C-3units ea.
ECE 147A-B-C (5 units ea.)
ECE 149
ECE 179D
ECE 179P
ECE 181
ECE 183

Electronic Systems

ECE122A-B
ECE125
ECE142
ECE144
ECE145A-B-C:
5 units each
ECE146A-B:
5 units each
ECE148

Engineering & Technology Management*

TMP 120
TMP 122

*Students may count ONE TMP course as a departmental elective

Signal Processing and Communications

ECE 130C
ECE 146A-B
ECE 148
ECE 158
ECE 160
ECE 178
ECE 180
ECE 181

Nanotechnology: Material & Devices

ECE 120A-B
ECE135
ECE141A-B-C (A&C-3 units ea)
ECE144
ECE162A-B-C
Materials 100A-C (3 units ea)
Materials 100B or Materials 101
- (3 units ea)

Other

ECE 192 or ECE 196 (4 units combined max)
ECE 194AA-ZZ (Except 194R)

Approved Departmental Sequences

Design Sequences

ECE 120A & ECE 120B
ECE 122A & ECE 122B
ECE 145A & ECE 145B (5 units each)
ECE 146A & ECE 146B (5 units each)
ECE 147A & ECE 147B (5 units each)
ECE 147A & ECE 147C (5 units each)
ECE 153A & ECE 153B
ECE 158 & ECE 178
ECE 178 & ECE 181
ECE 179D & ECE 179P

Other Sequences

ECE 122A & ECE 120A
ECE 123 & ECE 122B
ECE 141A & ECE 141B (ECE 141A: 3 units)
ECE 141A & ECE 141C (3 units each)
ECE 144 & ECE 135
ECE 145A & ECE 145C (5 units each)
ECE 145A & ECE 146A (5 units each)
ECE 148 & ECE 158
ECE 148 & ECE 178
ECE 154A & ECE 154B
ECE 157A & ECE 157B
ECE 158 & ECE 181
ECE 160 & ECE 178
ECE 160 & ECE 181
ECE 162A & ECE 162B

EE Senior Elective Summary

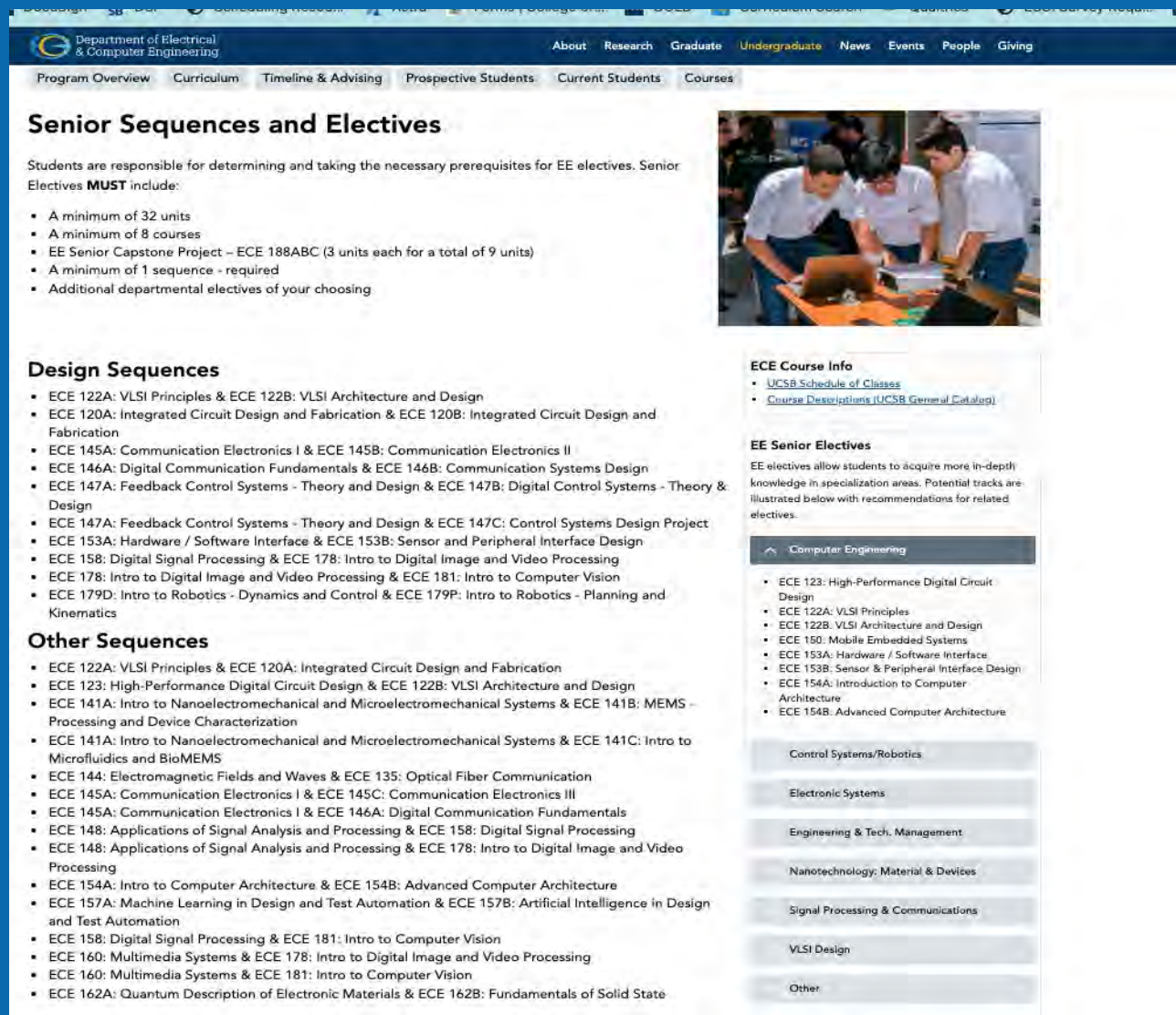
- 🌐 Capstone Project: ECE 188 ABC; Include your completed electives!
Run quarterly progress report
 - 🌐 One (1) Sequence
 - 🌐 32 units, 8 courses
-



Important
FORMS

Elective Course Scheduling Resources

ECE course scheduling, go to ece.ucsb.edu



The screenshot shows the Department of Electrical & Computer Engineering website. The main navigation bar includes links for About, Research, Graduate, Undergraduate, News, Events, People, and Giving. Below this, a secondary navigation bar lists Program Overview, Curriculum, Timeline & Advising, Prospective Students, Current Students, and Courses. The main content area is titled "Senior Sequences and Electives" and includes a list of requirements for EE electives. To the right of this text is a photograph of three students working together at a table with a laptop. Below the requirements, there are sections for "Design Sequences" and "Other Sequences", each with a list of course numbers and titles. On the right side of the page, there is a sidebar with "ECE Course Info" (including links to the schedule of classes and course descriptions) and "EE Senior Electives" (with a paragraph explaining that EE electives allow for specialization). At the bottom of the sidebar, there is a list of course categories: Computer Engineering, Control Systems/Robotics, Electronic Systems, Engineering & Tech. Management, Nanotechnology: Material & Devices, Signal Processing & Communications, VLSI Design, and Other.

Department of Electrical & Computer Engineering

About Research Graduate Undergraduate News Events People Giving

Program Overview Curriculum Timeline & Advising Prospective Students Current Students Courses

Senior Sequences and Electives

Students are responsible for determining and taking the necessary prerequisites for EE electives. Senior Electives **MUST** include:

- A minimum of 32 units
- A minimum of 8 courses
- EE Senior Capstone Project – ECE 188ABC (3 units each for a total of 9 units)
- A minimum of 1 sequence - required
- Additional departmental electives of your choosing

Design Sequences

- ECE 122A: VLSI Principles & ECE 122B: VLSI Architecture and Design
- ECE 120A: Integrated Circuit Design and Fabrication & ECE 120B: Integrated Circuit Design and Fabrication
- ECE 145A: Communication Electronics I & ECE 145B: Communication Electronics II
- ECE 146A: Digital Communication Fundamentals & ECE 146B: Communication Systems Design
- ECE 147A: Feedback Control Systems - Theory and Design & ECE 147B: Digital Control Systems - Theory & Design
- ECE 147A: Feedback Control Systems - Theory and Design & ECE 147C: Control Systems Design Project
- ECE 153A: Hardware / Software Interface & ECE 153B: Sensor and Peripheral Interface Design
- ECE 158: Digital Signal Processing & ECE 178: Intro to Digital Image and Video Processing
- ECE 178: Intro to Digital Image and Video Processing & ECE 181: Intro to Computer Vision
- ECE 179D: Intro to Robotics - Dynamics and Control & ECE 179P: Intro to Robotics - Planning and Kinematics

Other Sequences

- ECE 122A: VLSI Principles & ECE 120A: Integrated Circuit Design and Fabrication
- ECE 123: High-Performance Digital Circuit Design & ECE 122B: VLSI Architecture and Design
- ECE 141A: Intro to Nanoelectromechanical and Microelectromechanical Systems & ECE 141B: MEMS - Processing and Device Characterization
- ECE 141A: Intro to Nanoelectromechanical and Microelectromechanical Systems & ECE 141C: Intro to Microfluidics and BioMEMS
- ECE 144: Electromagnetic Fields and Waves & ECE 135: Optical Fiber Communication
- ECE 145A: Communication Electronics I & ECE 145C: Communication Electronics III
- ECE 145A: Communication Electronics I & ECE 146A: Digital Communication Fundamentals
- ECE 148: Applications of Signal Analysis and Processing & ECE 158: Digital Signal Processing
- ECE 148: Applications of Signal Analysis and Processing & ECE 178: Intro to Digital Image and Video Processing
- ECE 154A: Intro to Computer Architecture & ECE 154B: Advanced Computer Architecture
- ECE 157A: Machine Learning in Design and Test Automation & ECE 157B: Artificial Intelligence in Design and Test Automation
- ECE 158: Digital Signal Processing & ECE 181: Intro to Computer Vision
- ECE 160: Multimedia Systems & ECE 178: Intro to Digital Image and Video Processing
- ECE 160: Multimedia Systems & ECE 181: Intro to Computer Vision
- ECE 162A: Quantum Description of Electronic Materials & ECE 162B: Fundamentals of Solid State

ECE Course Info

- [UCSB Schedule of Classes](#)
- [Course Descriptions \(UCSB General Catalog\)](#)

EE Senior Electives

EE electives allow students to acquire more in-depth knowledge in specialization areas. Potential tracks are illustrated below with recommendations for related electives.

Computer Engineering

- ECE 123: High-Performance Digital Circuit Design
- ECE 122A: VLSI Principles
- ECE 122B: VLSI Architecture and Design
- ECE 150: Mobile Embedded Systems
- ECE 153A: Hardware / Software Interface
- ECE 153B: Sensor & Peripheral Interface Design
- ECE 154A: Introduction to Computer Architecture
- ECE 154B: Advanced Computer Architecture

Control Systems/Robotics

Electronic Systems

Engineering & Tech. Management

Nanotechnology: Material & Devices

Signal Processing & Communications

VLSI Design

Other

ece.ucsb.edu/undergrad/curriculum

Elective Course Scheduling Resources

Department of Electrical & Computer Engineering

About Research Graduate **Undergraduate** News Events People Giving

Program Overview Curriculum Timeline & Advising Prospective Students Current Students **Courses**

ECE Undergraduate Courses 2023-24

This proposed schedule is subject to change. To review the most up-to-date listings of all courses, instructors, times and locations refer to [GOLD \(UCSB Student Gaucho On-line Data\)](#). If you do not have access to GOLD, refer to the [UCSB Schedule of Classes](#).

Students are responsible for determining and completing the necessary prerequisites for all ECE courses.

[See ECE Graduate Courses -->](#)

Undergraduate Courses

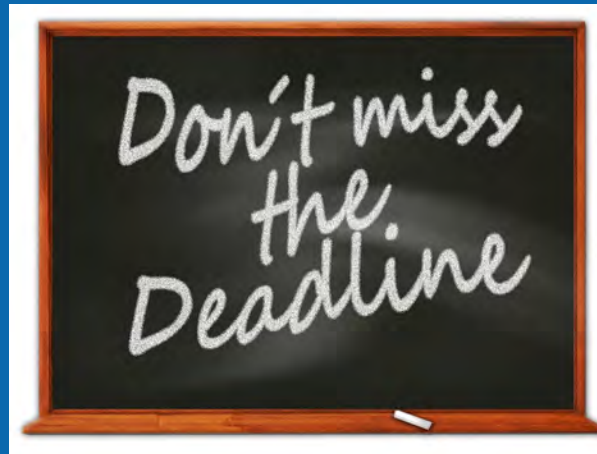
Courses Offered: X = ECE Instructor | XD = External Dept Instructor

Number	Undergraduate Course	F2023	W2024	S2024	M2024
1A	Computer Engineering Seminar		X		
1B	Ten Puzzling Problems in Computer Engineering			X	
3	Introduction to Electrical Engineering	X	X		
5	Introduction to Electrical and Computer Engineering	X	X		
6	The Physics of Energy, Information, and Communication			X	
10A/10AL	Foundations of Analog and Digital Circuits & Systems	X	X		
10B/10BL	Foundations of Analog and Digital Circuits & Systems		X	X	
10C/10CL	Foundations of Analog and Digital Circuits & Systems	X		X	
15A	Fundamentals of Logic Design	X	X		
120A	Integrated Circuit Design & Fabrication		X		
120B	Integrated Circuit Design & Fabrication			X	
122A	VLSI Principles	X			
122B	VLSI Architecture and Design			X	
130A	Signal Analysis & Processing	X	X		
130B	Signal Analysis & Processing		X	X	
130C	Introduction to Applied Linear Algebra			X	
132	Intro to Solid State Electronic Devices	X			

ece.ucsb.edu/undergrad/courses

DUE DATES

- Elective Sheets are due *no later than Friday, June 14, 2024!*
- Students who have not turned in an elective sheet will be placed on a **REGISTRATION BLOCK!**



Progress Checks

- Can be run on GOLD using the degree audit system.
- GE/College level questions refer to the College of Engineering advisors, coe-info@engineering.ucsb.edu or:
 - Frances Fouch francesf@engineering.ucsb.edu
 - Shariq Hashmi shasmi@engineering.ucsb.edu
 - Sarah Ocampo socampo@engineering.ucsb.edu
- Major level questions refer to the ECE Student Office ugrad-advisor@ece.ucsb.edu or undergrad@ece.ucsb.edu

BS/MS Program

- 🌐 **Electrical & Computer Engineering BS/MS**
- 🌐 BS in EE and MS in ECE.
 - 🌐 Go to: <https://www.ece.ucsb.edu/grad/bs-ms>
- 🌐 For Fall 2024 admission, the application deadline is June 14, 2024.
 - 🌐 Applications for the BS/MS in ECE are due at the end of the spring quarter of the junior year. As this is an accelerated program, it is expected that all of the required courses for the CE major are completed including all of the junior required courses. GRE exams are not required to apply.
 - 🌐 Contact the Graduate Admissions Coordinator for questions about applying to the BS/MS program: grad-admit@ece.ucsb.edu



BS/MS Programs

- BS in EE and MS in MATRL, see the Materials Department website:
materials.ucsb.edu/academics/bsms-5-year-program
- Express your interest as early as possible by emailing:
 - academic@engineering.ucsb.edu

Maddie W. Foster

Associate Director, Career Education

Engineering + Technology

UC SANTA BARBARA
Career Services

Discover Options Gain Experience Get Hired Explore Grad School Career Paths Communities Grad Students

Career Advising

Career Peer Advising

Start here for all of your career planning needs by meeting with a Career Peer Advisor in a 15-minute session. Choose from two methods below.

DROP-IN

Hours:

- Mon-Fri, 9:00 a.m.–4:00 p.m.

Step 1: Enter the queue in QLess

Step 2: Select your preferred medium:

- In-person (Career Resources Room, Building 599)
- Virtual (Zoom)
- Phone (Zoom)

Step 3: Check your phone for updates – when it's your turn, you will receive a text with information to begin your meeting

[Enter QLess](#)

APPOINTMENT

Hours:

- Mon-Fri, 11:00 a.m.–3:00 p.m.

Step 1: Login to Handshake and click the Career Center menu to find the Appointments option (must schedule 24+ hours prior)

Step 2: Choose the Career Peer Advising appointment category, include details about your request in the Help Requested box, and select your preferred medium:

- In-person (Career Resources Room, Building 599)
- Virtual (Zoom)
- Phone (Zoom)

Step 3: Review your confirmation email for instructions to check in to your appointment

[Login to Handshake](#)

Career Path Advising

Dive deeper into your goals in a 30-minute session with a Career Counselor. Gain a referral from Career Peer Advising to utilize this service.

APPOINTMENT

Hours:

- Mon-Fri, 8:30 a.m.–6:00 p.m.

Step 1: Login to Handshake and click the Career Center menu to find the Appointments option (must schedule 24 hours prior)

Step 2: Choose the best appointment category and type, include details about your request in the Help Requested box, and select your preferred medium:

- Virtual (Zoom)



Maddie.Foster@sa.ucsb.edu

career.ucsb.edu

Career Paths

Your Gaucho Paths to Success



Engineering + Technology

Get Your Gears Turning



How many engineering disciplines can you name?

UCSB educates students in five key areas: chemical engineering, mechanical engineering, electrical engineering, computer engineering, and computer science. However, there are over 50 other engineering disciplines to discover including aerospace, automotive, biochemical, civil, environmental, geotechnical, industrial, manufacturing, nanotechnology, nuclear, petroleum, security, telecommunications, and traffic engineering. All areas overlap with basic engineering knowledge and skills.

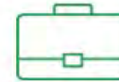
Learn how you can pursue your discipline or pivot your UCSB education into the area of your choice through a career path in Engineering + Technology.

Recent Postings

Click to view opportunities related to **Engineering + Technology** in Handshake. Customize your filters and learn how to search for UCSB career success!



[Related Events >>](#)
[How to Prepare for Success >>](#)




[Related Jobs & Internships >>](#)
[How to Search / Search Safely >>](#)

Handshake Help Center



Handshake is the premium platform for Gauchos to find **jobs, internships, and career connections**. Ranging from part-time to full-time positions, on-campus and off-campus, Handshake is a gateway to gainful employment in the world of work. Many postings are viewable exclusively to students/alumni of UCSB, providing an edge to engage with employers. Handshake also offers approved Work-Study positions, a database of thousands of employers, and much more.

 Looking to schedule an appointment via Handshake? Visit our [Students](#) page.

HANDSHAKE HELP CENTER

[GET ACCESS TO HANDSHAKE](#)

[COMPLETE YOUR PROFILE](#)

[UPDATE YOUR CAREER INTERESTS](#)

[SEARCH THE PLATFORM](#)

[PREPARE FOR VIRTUAL FAIRS](#)

Get Access to Handshake

Who Has Access?

Access is available to all **registered students** with an active UCSB NetID and all **UCSB alumni**. For others looking to login to Handshake, visit our Handshake information for [Alumni](#), [Faculty and Staff](#), and [Recruiters](#).

Special Note During COVID: UCSB students who take time off due to COVID can request access to Handshake for the first quarter of their time off. Inquiries can be directed to CareerHelp@sa.ucsb.edu.

<https://career.ucsb.edu/handshake-help-center>

An aerial photograph of the University of California, Santa Barbara campus during sunset. The sky is a gradient of blue and orange, with the sun low on the horizon. The campus features several buildings, a large parking lot filled with cars, and a prominent tower on the right side. The text is overlaid on the image in a large, white, sans-serif font with a slight drop shadow.

Winter 2024 Career & Internship Fair Science, Technology & Engineering

Wed., January 24, 2024,
10am – 4pm, Corwin Pavilion

career.ucsb.edu

Website



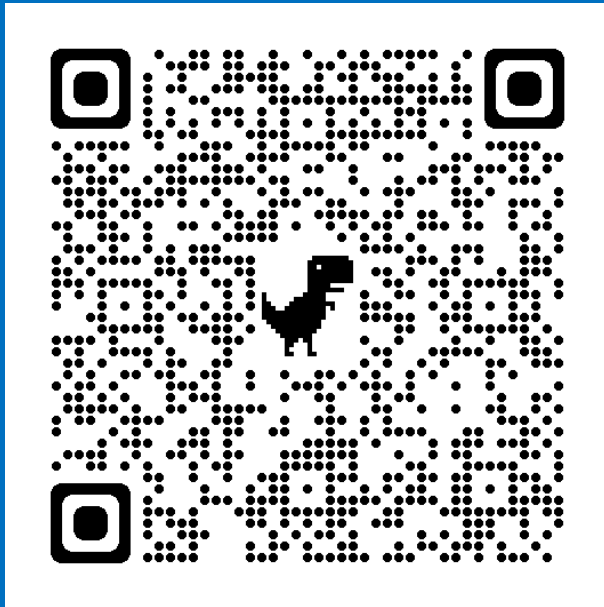
<http://www.ece.ucsb.edu/undergrad/>

This website has all the information regarding the undergraduate program.

For course offerings in ECE, the website is:

<http://www.ece.ucsb.edu/undergrad/courses/>

Mandatory - Sign in Below:



-  Will let us know who is in attendance
-  Give us feedback!



<https://forms.gle/m1hSuwdXk4Xcc7z1A>

QUESTIONS?

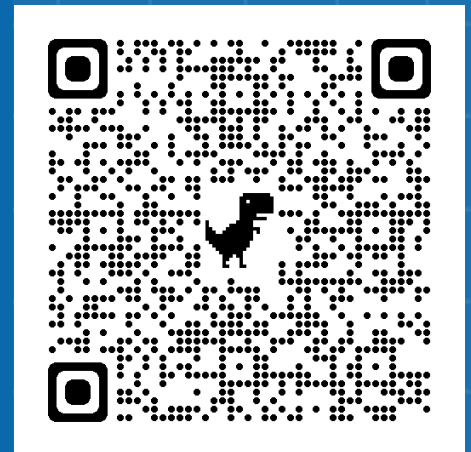


Beth English
ugrad-advisor@ece.ucsb.edu

or

Joanna Villalobos
undergrad@ece.ucsb.edu

Submit an
inquiry below:



What is Electronics/Photonics?

- Understanding the physics of devices
 - diodes, transistors, lasers, detectors, ...
- Understand the materials
 - semiconductors, metals, insulators, superconductors
- Application to IC design and fabrication
 - analog, digital, microwave, optical

Senior Electives

- Semiconductor physics: ECE162ABC
- Integrated electronics: ECE 123, 120A/120B, 122A
- MEMs: ECE141ABC
- High frequency electronics: ECE145ABC
- E/M and optical fiber: ECE144, 135

Semiconductor Physics Series

162A **Quantum Mechanics**

- learn to think small! put an electron in a box

162B **Solid State Physics**

- crystal structure, electrons in solids, applications

162C **Optoelectronic Materials and Devices**

- “sheds light” on semiconductor photonic devices!
- lasers, LEDs, detectors, solar cells

- Prerequisites: ECE 130AB + ECE 134

Integrated Electronics

122A (F), 122B (W)

VLSI Principles

- IC design at the transistor level
- Issues in nanoscale CMOS
- CAD tools
- Interconnections and packaging
- Design project
- ECE 122A prerequisites: ECE152A
- ECE 122B prerequisites: ECE 123 or ECE 122A

Integrated Electronics

120A or 123 and 120B

IC Design and Fabrication (WS)

- Semiconductor device processing
- Fabricate ICs in the solid state lab
- **ECE 120A prerequisite: ECE132**

Micro-Electro-Mechanical (MEMs)

- ECE141ABC MicroElectroMechanical Systems (MEMS)
 - Integrated actuators, sensors, processing techniques, microfluids
- Prerequisites: ECE130A; ECE137A

High Frequency Electronics

- 145AB Communication Electronics (FW)
 - Design of high frequency wireless communication circuits
- 145C High Speed Bipolar Mixed Signal IC design (S)
 - High speed circuits for broadband communications
- Prerequisites: ECE137A/B

E/M and applications

- ECE144 Electromagnetic Fields & Waves (W)
 - Physics and applications of E&M
- Prerequisite: ECE134
- ECE135 Optical Fiber Communication (S)
 - Physics, components, and applications
- Prerequisites: ECE132 and ECE134

Other Sequences

- ECE 120A & 120B
- ECE 122A & 120A
- ECE 122A & 122B
- ECE 123 & 122B
- ECE 145A & 145C
- ECE 145A & 145B



CE Senior Elective Courses



- **ECE 122A** **VLSI Principles**
- **ECE 122B** **VLSI Architecture and Design**
- **ECE 123** **High-Performance Digital Circuit Design**
- **ECE 153A** **The Hardware/Software Interface**
- **ECE 153B** **Sensor and Peripheral Interface Design**
- **ECE 154A** **Introduction to Computer Architecture**
- **ECE 154B** **Advanced Computer Architecture**
- **ECE 157A** **Machine Learning in Design/Test Automation**
- **ECE 157B** **Artificial Intelligence in Design/Test Automation**
- **ECE 189A-189B-189C** **Computer Engineering Project (Senior Capstone)**



CE Senior Elective Track Courses



- **Very Large Scale Integration (VLSI)** **ECE 123/122A or 122A/B**
- **Embedded Systems Design** **ECE 153A/B**
- **Computer Architecture** **ECE 154A/B**
- **Design and Test Automation** **ECE 157A/B**
- **Capstone Design Project** **ECE 189A/B/C**



ECE 123/122B or 122A/B Very Large Scale Integration



- **Modern VLSI design of integrated circuits**
 - **Architectural and circuit design issues and constraints for high-performance, low-power, large-scale systems**
 - **Field effect transistors, layout rules, parasitics, pin limitations, noise and crosstalk, clock and power distribution**
- **Practical issues in integrated circuit design**
 - **Noise/Crosstalk/EMI, variability and yield**



ECE 153 A/B

Embedded Systems Design



- **Technology from which modern embedded digital computer systems are built**
 - **Real time programming**
 - **Modal and reactive systems**
- **Major hardware/software components, design issues, implementation mechanisms, and interfaces between components**
 - **Hardware/software interface**
 - **Sensor and peripheral interface**



ECE 154 A/B

Computer Architecture



- **ECE 154A: Introduction to Computer Architecture**
- **ECE 154B: Advanced Computer Architecture**
 - **Topics include computer architectures with various types (data-, task-, instruction level) of parallelism and memory systems design.**



ECE 157 A/B

Design and Test Automation



- Hardware design and verification through use of software tools: applying machine learning for data analytics in hardware design and verification process
- Design workflows to model engineering processes in hardware test and verification: capturing human perception in an engineering workflow with AI approaches



ECE 189 A/B/C

Computer Engineering Project



- **Design and implementation of a complete digital system including both hardware and software**
 - **ECE 189A (Fall) – Project definition, high-level system requirements, detailed system design, ready for manufacture**
 - **ECE 189B (Winter)- Printed circuit boards(PCB) are fabricated and assembled. Focus shifts to software development on a development kit**
 - **ECE 189C (Spring) – Final assembly, debugging, verification, subsystem and system integration, final presentation**

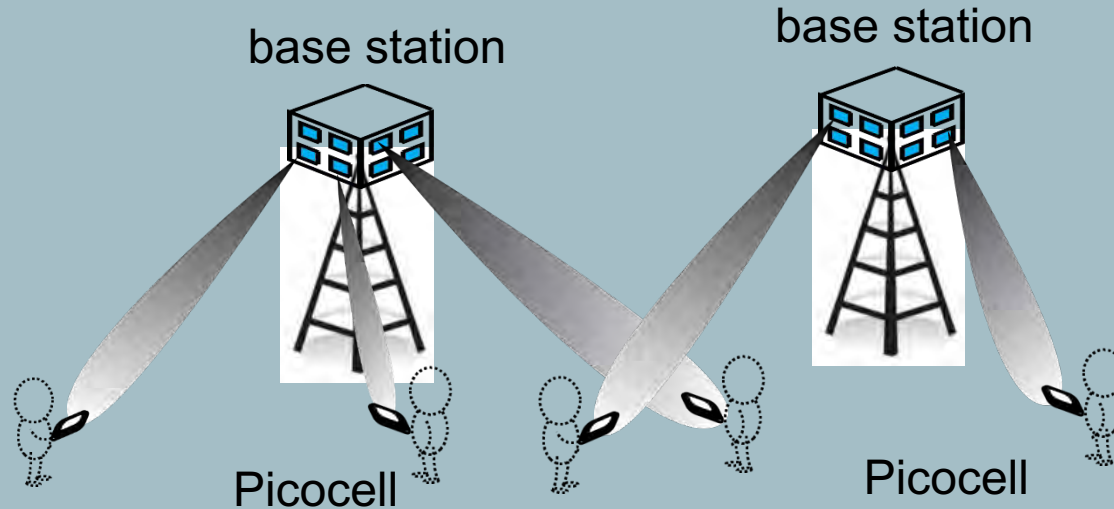
COMMUNICATIONS, CONTROLS & SIGNAL PROCESSING (CCSP)

- Communications
- Control
- Signal Processing

COMMUNICATIONS

Has completely transformed our lives over the last 2-3 decades
Internet Edge--Cellular, WiFi (Qualcomm, Broadcom, Apple, Samsung)
Internet core (Cisco, Juniper)
Applications (Google, Facebook)

UCSB's ComSender aims to drive the next phase in this revolution



1000-10000X increased capacity at the edge

COMMUNICATIONS SEQUENCE

- ECE 146A: Digital Communication Fundamentals
- ECE 146B: Communication Systems Design

Intellectual framework

Probabilistic modeling, Systematic design principles

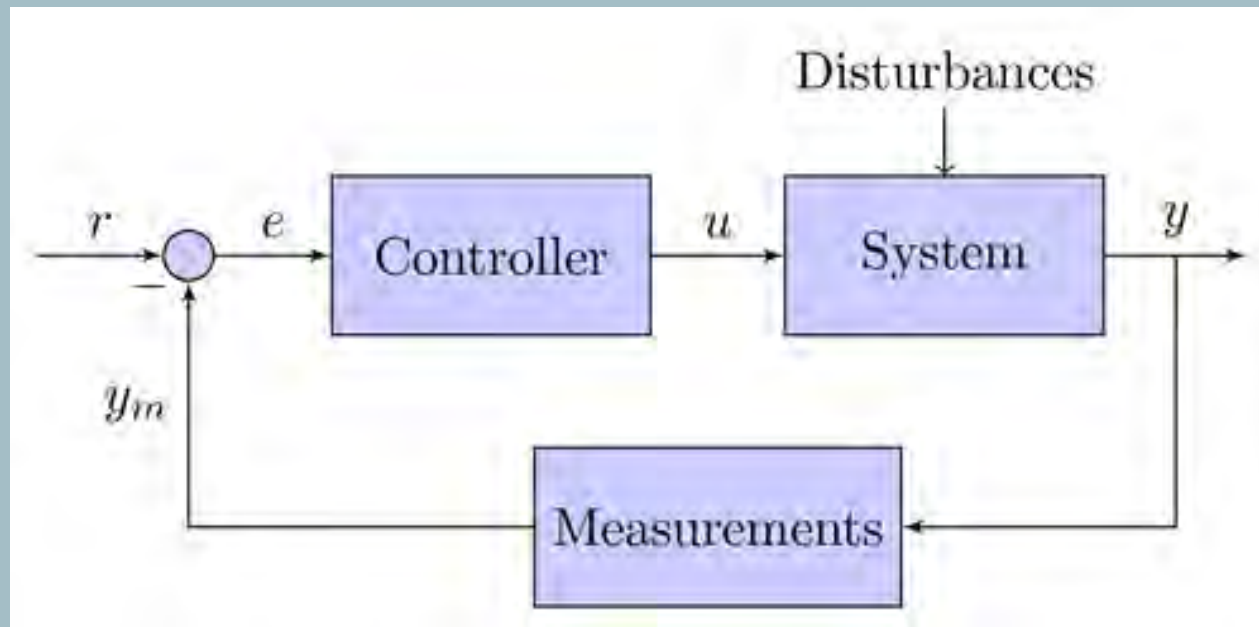
Goal is to approach fundamental limits

Portable skillset in modeling and signal processing algorithms

CONTROLS

How feedback can be used to make systems behave in a desired manner

Planes, trains, automobile, robots,...



UCSB is a world leader in controls

Center for Control, Dynamical Systems and Control (CCDC) spans multiple depts in CoE

CONTROL SEQUENCE

- ECE 147A: Feedback Control Systems – Theory and Design
- ECE 147B: Digital Control Systems – Theory and Design
- ECE 147C: Control System Design Project

SIGNAL PROCESSING

Very broad term: Understanding and manipulating signals

Core skillset used in pretty much every engineering discipline

Communications, control, sensing/imaging

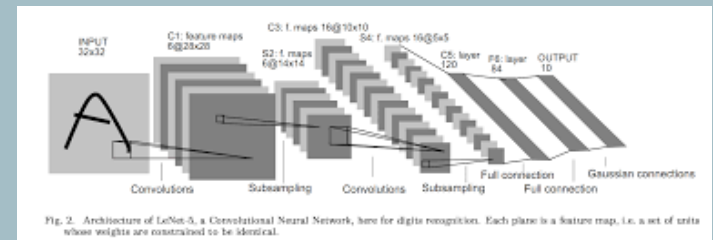


Fig. 2. Architecture of LeNet-5, a Convolutional Neural Network, here for digit recognition. Each plane is a feature map, i.e. a set of units whose weights are constrained to be identical.

SIGNAL PROCESSING SEQUENCE

- ECE 148: Applications of Signal Analysis and Processing
- ECE 158: Digital Signal Processing
- ECE 178: Introduction to Digital Image and Video Processing
- ECE 181: Introduction to Computer Vision

PLAN EE ELECTIVES/SEQUENCES ECE UNDERGRADUATE COURSES 2023-24

<https://www.ece.ucsb.edu/undergrad/courses>

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[See ECE Graduate Courses -->](#)

Undergraduate Courses

Courses Offered: X = ECE Instructor | XD = External Dept Instructor

Number	Undergraduate Course	F2023	W2024	S2024	M2024
1A	Computer Engineering Seminar		X		
1B	Ten Puzzling Problems in Computer Engineering			X	
3	Introduction to Electrical Engineering	X	X		
5	Introduction to Electrical and Computer Engineering	X	X		
6	The Physics of Energy, Information, and Communication			X	
10A/10AL	Foundations of Analog and Digital Circuits & Systems	X	X		
10B/10BL	Foundations of Analog and Digital Circuits & Systems		X	X	
10C/10CL	Foundations of Analog and Digital Circuits & Systems	X		X	
15A	Fundamentals of Logic Design	X	X		
120A	Integrated Circuit Design & Fabrication		X		
120B	Integrated Circuit Design & Fabrication			X	
122A	VLSI Principles	X			
122B	VLSI Architecture and Design			X	
130A	Signal Analysis & Processing	X	X		
130B	Signal Analysis & Processing		X	X	
130C	Introduction to Applied Linear Algebra			X	
132	Intro to Solid State Electronic Devices	X			

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- ECE 147A & B, 147A & C
- ECE 178 & 181
- ECE 158 & 178

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Winter

Spring

ECE 145A

ECE 145B

COMPLEMENTARY SEQUENCES

■ Fall

Winter

Spring

■ ECE 145A

ECE 145B

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ECE 144

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OTHERS

- ECE 192: ECE projects
- ECE 193: Research internship
- ECE 196: Undergraduate research
- ECE 199: Independent study
- ECE 200+: Graduate courses