



# Computer Engineering CE Senior Electives 2016-2017 & Later

Computer Engineering Program · UC Santa Barbara

LAST NAME, FIRST NAME \_\_\_\_\_ Perm # \_\_\_\_\_

UCSB EMAIL \_\_\_\_\_ PHONE # \_\_\_\_\_

STUDENTS ARE RESPONSIBLE FOR DETERMINING AND TAKING THE NECESSARY PREREQUISITES FOR THE CLASSES LISTED BELOW AS THEY DO CHANGE. FOR THE MOST UP-TO-DATE INFORMATION, CHECK WITH THE COMPUTER SCIENCE STUDENT OFFICE FOR CS COURSES AND THE ECE STUDENT OFFICE FOR ECE COURSES.

COURSE – Include all completed electives	UNITS
“Capstone” Project (ECE189A/B/C or CS 189A/B)	
Sequence 1 (2 courses min.)	
Sequence 2 (2 courses min.)	
Other Electives	
<b>MIN. REQUIRED</b>	<b>48</b>
<b>TOTAL UNITS:</b>	

Total Units: A minimum total of at least twelve courses (48 units) including two sequences plus a Capstone Project. Include all completed CE senior electives.

Student’s Signature \_\_\_\_\_

Date \_\_\_\_\_

Faculty Advisor’s Signature \_\_\_\_\_

Date \_\_\_\_\_

ECE Student Office \_\_\_\_\_

Date \_\_\_\_\_

Check Here	Sequence Topics	Senior Elective Sequences (choose 2)
	Computer Networks	<ul style="list-style-type: none"> <li>• CMPSC 176A (Intro to Comp Communication Networks)</li> </ul> <b>AND</b> <ul style="list-style-type: none"> <li>• CMPSC 176B (Network Computing)</li> </ul>
	Computer Systems Design	<ul style="list-style-type: none"> <li>• ECE 153A <b>OR</b> CMPSC 153A (Hardware/Software Interface)</li> </ul> <b>AND</b> <ul style="list-style-type: none"> <li>• ECE 153B (Sensor and Peripheral Interface Design)</li> </ul>
	Distributed Systems	<ul style="list-style-type: none"> <li>• CMPSC 171: Distributed Systems</li> </ul> <b>AND ONE OR BOTH OF THE FOLLOWING COURSES:</b> <ul style="list-style-type: none"> <li>• CMPSC 176A: Intro. to Computer Networks</li> <li>• CMPSC 176B: Network Computing</li> </ul>
	Multimedia	<b>Choose TWO OR MORE of the following courses:</b> <ul style="list-style-type: none"> <li>• ECE 178 (Fundamentals of Computer Image Processing)</li> <li>• ECE 181 <b>OR</b> CMPSC 181 (Introduction to Computer Vision)</li> <li>• ECE 160 (Multimedia Computing)</li> </ul>
	Programming Languages	<ul style="list-style-type: none"> <li>• *CMPSC 160 (Translation of Programming Languages)</li> <li>• *CMPSC 162 (Programming Languages)</li> </ul> <b>(*Note: CMPSC 138, a Junior year course, is the prerequisite for both CMPSC 160 &amp; 162)</b>
	Real-Time Computing & Control	<ul style="list-style-type: none"> <li>• *ECE 147A (Feedback Control Systems - Theory and Design, 5 units)</li> </ul> <b>(*Note: ECE 147A prerequisite is ECE 130AB – Junior year)</b> <ul style="list-style-type: none"> <li>• ECE 147B (Digital Control Systems - Theory and Design, 5 units)</li> </ul>
	Very Large Scale Integration (VLSI)	<ul style="list-style-type: none"> <li>• ECE 122A (VLSI Principles) <b>OR</b> ECE 123 (High-Performance Digital Circuit Design)</li> <li>• ECE 122B (VLSI Architecture and Design)</li> </ul>
	Robotics	<ul style="list-style-type: none"> <li>• ECE 179D (Introduction to Robotics: Dynamics and Control)</li> <li>• ECE 179P (Introduction to Robotics: Planning and Kinematics)</li> </ul>
	Signals & Systems	<ul style="list-style-type: none"> <li>• ECE 130A (Signal Analysis &amp; Processing)</li> <li>• ECE 130B (Signal Analysis &amp; Processing)</li> </ul>
	Design & Test Automation	<ul style="list-style-type: none"> <li>• ECE 157A (Machine Learning in Design and Test Automation)</li> <li>• ECE 157B (Artificial Intelligence in Design and Test Automation)</li> </ul>
	Machine Learning	<ul style="list-style-type: none"> <li>• CMPSC 165A (Artificial Intelligence)</li> <li>• CMPSC 165B (Machine Learning)</li> </ul>
	Systems Software Architecture	<ul style="list-style-type: none"> <li>• CMPSC 170 (Operating Systems)</li> <li>• CMPSC 171 (Distributed Systems)</li> </ul>

### Required Senior “Capstone” Computer Systems Project

12 Units	<b>*ECE 189A/B/C</b> (3 qtr. course, 4 units/qtr., 12 units) <b>(*Note: ECE 153B, Sensor &amp; Peripheral Interface Design, is a prerequisite for ECE 189A/B/C)</b>	<b>OR</b>	<b>*CMPSC 189A/B</b> (2 qtr. course, 4 units/qtr., 8 units) <b>(*Note: CMPSC 156, Advanced Applications Programming, is a prerequisite course CMPSC189A/B)</b>	8 Units
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### Acceptable Additional Courses

CMPSC 130B (Data Structures and Algorithms II)	4	ECE 130C (Signal Analysis and Processing)	4
CMPSC 138 (Automata and Formal Languages)	4	ECE 147A (Feedback Control Sys-Theory & Design)	5
CMPSC 160 (Translation of Programming Languages)	4	ECE 147B (Digital Control-Theory & Design)	5
CMPSC 162 (Programming Languages)	4	ECE 149 (Game Theory)	4
CMPSC 165A (Artificial Intelligence)	4	ECE 150 (Mobile Embedded Systems)	4
CMPSC 165B (Machine Learning)	4	ECE 153A/CMPSC 153A (Hardware/Software Interface)	4
CMPSC 170 (Operating Systems)	4	ECE 153B (Sensor and Peripheral Interface Design)	4
CMPSC 171 (Distributed Systems)	4	ECE 154B (Advanced Computer Architecture)	4
CMPSC 174A (Fundamentals of Database Systems)	4	ECE 157A (Machine Learning in Design & Test Automation)	4
CMPSC 176A (Intro to Comp Communication Networks)	4	ECE 157B (A.I. in Design & Test Automation)	4
CMPSC 176B (Network Computing)	4	ECE 160 (Multimedia Computing)	4
CMPSC 176C (Advanced Topics in Internet Computing)	4	ECE 178 (Fund. of Computer Image Processing)	4
CMPSC 177 (Computer Security)	4	ECE 179D (Intro to Robotics: Dynamics & Control)	4
CMPSC 178 (Introduction to Cryptography)	4	ECE 179P (Intro to Robotics: Planning & Kinematics)	4
ECE 122A (VLSI Principles)	4	ECE 180 (Introduction to Deep Learning)	4
ECE 122B (VLSI Architecture and Design)	4	ECE 181/CMPSC 181 (Introduction to Computer Vision)	4
ECE 123 (High-Performance Digital Circuit Design)	4	ECE 194AA-194ZZ (except ECE 194R) (Special Topics in ECE)	4
ECE 130A (Signal Analysis and Processing)	4		
ECE 130B (Signal Analysis and Processing)	4	CMPSC 156 (Advanced Applications Programming)	4