

# **Robotics Engineering**

Fall Quarter	Units	Winter Quarter	Units	Spring Quarter	Un
		FIRST YEAR			
ENGL 001A	4	ENGL 001B	4	Breadth	4
Beginning Composition		Intermediate Composition		Humanities/Social Sciences	
MATH 009A	4	MATH 009B	4	MATH 009C	4
First Year Calculus		First Year Calculus		First Year Calculus	
CS 010A	4	CS 010B	4	CS 010C	4
Intro to Computer Science I		Intro to Computer Science II		Intro to Data Structures & Alg	orithms
ME 009	4	PHYS 040A	5	PHYS 040B	5
Engineering Graphics & Design		Physics (Mechanics)		Physics (Heat/Waves/Sound)	
		SECOND YEAR			
CS 100	4	EE 106	4	CS 061	4
Software Construction	Programming Practical Robotics		;	Machine Org & Assembly Lang Prog	
MATH 010A	4	MATH 046	4	MATH 011	4
Multivariable Calculus		Differential Equations		Intro to Discrete Structures	
PHYS 040C	5	EE 005	4	MATH 031	5
Physics (Electricity/Magnetism)		Circuits and Electronics		Applied Linear Algebra	
Breadth	4	Breadth	4	ME 010	4
Humanities/Social Sciences		Biological Science		Statics	
		THIRD YEAR			
EE/ME 144	4	CS/EE 120A	4	CS/EE 120B	4
Foundations of Robotics		Logic Design		Embedded Systems	
EE 111	4	EE 114	4	EE 132	4
Digital &Analog Sig & Systems		Prob, Rand Variables & Rand Pro	cess	Automatic Control	
ME 120	4	ME 103	4	Technical Elective	4
Linear Systems and Control		Dynamics			
Breadth	4	Breadth	4	ENGR 180W	4
Humanities/Social Sciences		Humanities/Social Sciences		Technical Communication	
		FOURTH YEAR			
EE 142 / CS 171	4	EE/ME 145	4	Technical Elective	4
Intro to Mach Learning & Data N	⁄lining	Robotic Planning and Kinematic	s		
SENIOR DESIGN 1*	4	SENIOR DESIGN 2*	4	Technical Elective	4
ENCS, ELEN or MCEN		ENCS, ELEN or MCEN			
Breadth	4	Technical Elective	4	Breadth	4
Humanities/Social Sciences				Humanities/Social Sciences	

<sup>\*</sup> Students have the option to complete one of the following sequences to satisfy senior design: ENCS (CS 178A & 178B), ELEN (EE 175A &175B) or MCEN (ME 175B & 175C)

To earn a B.S., you must complete all College and University requirements. For a full list of requirements, refer to www.catalog.ucr.edu.

Catalog Year: 2024

#### **ENGLISH COMPOSITION\***

A "C" or better is required in all English
Composition courses to satisfy the graduation
requirement. ENGR 180W fulfills the third
quarter of English Composition.

#### **BREADTH REQUIREMENTS**

For an approved list of Breadth courses, go to http://student.engr.ucr.edu/policies/requirements/ breadth.html.

Humanities: (3 courses)

- A. World History:
- B. Fine Arts, Lit., PHIL or RLST:
- C. Human Persp. on Science:

Social Sciences: (3 courses)

- A. ECON or POSC:
- B. ANTH, PSYC, or SOC:
- C. General Social Science:

Ethnicity: (1 course)

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Upper Division: (2 courses)

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- 2

## **TECHNICAL ELECTIVES \*\***

Please note that Technical Electives may be offered throughout the Academic Year.
Consult with your Academic Advisor about potential offerings. See approved technical electives on back.

Course Plan is subject to change.

184

**Total Units:** 

## **Robotics Technical Electives**

You must complete 4 courses (at least 16 units) of Technical Elective coursework.

## **Technical Electives**

CS 111: Discrete Structures (4)

CS 122A: Intermediate Embedded and Real-Time Systems (5)
CS 122B: Advanced Embedded and Real-Time Systems (5)

CS 135: Virtual Reality (4)

CS 141: Intermediate Data Structures and Algorithms (4)
CS 145: Combinatorial Optimization Algorithms (4)

CS 150: Automata and Formal Languages (4)

CS 160: Concurrent Programming and Parallel Systems (4)

CS 170: Introduction to Artificial Intelligence (4)

CS 173: Introduction to Natural Language Processing (4)

ME 110: Mechanics of Materials (4)

ME 122: Vibrations (4)

ME 130: Kinematic and Dynamic Analysis of Mechanisms (4)

ME 131: Design of Mechanisms (4)

ME 133: Introduction to Mechatronics (4)
ME 153: Finite Element Methods (4)

EE 100A: Electronic Circuits (4)

EE 115: Introduction to Communication Systems (4)
EE 128: Sensing and Actuation for Embedded Systems (4)

EE 141: Digital Signal Processing (4)

EE 146: Computer Vision (4)

EE 147: Graphics Processing Unit Computing and Programming (4)

EE 150: Digital Communications (4)
EE 151: Introduction to Digital Control (4)

EE 152: Image Processing (4)

ENGR 160: Introduction to Engineering Optimization Techniques (4)