ROBOTICS ENGINEERING (2024-2025)

FRESHMAN YEAR

First Semester	Credits	Second Semester	Credits
MATH 1131Q – Calculus I	4	MATH 1132Q – Calculus II	4
CHEM 1127Q – Gen. Chem. I	4	PHYS 1501Q – Engineering Physics I[1]	4
CSE 1010 – Intro. to Computing for Engr.	3	ENGR 1166 – Foundations of Engineering	3
ENGL 1007 – Writing	4	ECE 1401 – Programming for Elec. Engineers	3
ENGR 1000 – Orientation to Engr.	1	Content Area course[2]	3
	16		17

SOPHOMORE YEAR

First Semester	Credits	Second Semester	Credits
ECE 2001 – Electric Circuits	4	ECE 3101 – Signals and Systems	3
MATH 2110Q – Multivariable Calculus	4	MATH 2210Q – Applied Linear Algebra	3
MATH 2410Q – Differential Equations	3	ECE 3411 – Microprocessor Applications	3
PHYS 1502Q – Engineering Physics II[1]	4	ECE/ME 3161 – Introduction to Robotics	3
CSE 2050 – Data Structures and OO Design	3	CSE 2500 – Intro. to Discrete Systems or MATH 2710 – Transition to Adv. Maths	3
	18		15

JUNIOR YEAR

First Semester	Credits	Second Semester	Credits
ECE 3111 – Systems Analysis or ME 3253 – Linear System Theory	4/3	ECE/ME 3163 – Robot Control & Dynamics	3
ECE/ME 3162 –Robot Motion Planning	3	CSE 4820 – Intro to Machine Learning	3
CSE 3500 – Algorithms	3	Track Elective[3]	3
STAT 3345 – Prob. Models Engineers[4]	3	PHIL 1104 – Philosophy and Social Ethics[2]	3
Content Area course[2]	3	Content Area course[2]	3
	16/15		15

SENIOR YEAR

First Semester	Credits	Second Semester	Credits
ECE 4901/4900W[5] or ME 4972 or CSE 4939W[5] – Design I	3	ECE 4902 or ME 4973W[5] or CSE 4940 – Design II	3
ECE 4161: Robotics Systems Laboratory	3	Track Elective[3]	3
Track Elective[3]	3	Robotics Elective[6]	3
Content Area course[2]	3	Robotics Elective[6]	3
Elective	2/3	Content Area course[2]	3
	14/15		15

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[1] Either the two-semester sequence of PHYS 1401Q-1402Q or the three-semester sequence of PHYS 1201Q-1202Q followed by PHYS 1230 or 1530 may be taken instead to satisfy this requirement. However, only eight credits of PHYS 1201-1202-1230/1530 can be used toward the required 126 credits for the Engineering degree.

[2] The courses from content areas one (Arts and Humanities) and two (Social Sciences) must be from four different departments. One course from either content area one (Arts and Humanities) or content area two (Social Sciences) may also be used to fulfill one of the requirements from content area four (Diversity and Multiculturalism). One course from content area four must be an international course.

[3] Choose three (3) courses from one of the defined tracks: Electronics, Systems, Mechanical, Biomedical

[4] STAT 3345 can be replaced with MATH 3160, though STAT 3345 is recommended

[5] One additional W course must be taken, typically as one of the content-area courses.

[6] Choose two (2) courses from any of the tracks, but not already chosen as a track elective

Track Electives:

Choose 3 courses from one of the following tracks

Electronics Track

CSE 2301: Principles and Practice of Digital Logic Design
ECE 3201: Electronic Circuit Design and Analysis
ECE 3211: Power Electronics
ECE 3212: Electric Machines and Drives

Systems Track

CSE 3100: Systems Programming
CSE 4705: Artificial Intelligence
CSE 4709: Networked Embedded Systems
ECE 4131: Digital Signal Processing
ECE 4132: Image Processing Systems Laboratory

Mechanical Track

CE 2110: Applied Mechanics I
ME 2120: Applied Mechanics II
CE 3110: Mechanics of Materials
ME 3220: Mechanical Vibrations
ME 3221: Manufacturing Automation
ME 3227: Design of Machine Elements
ME 3262: Applied Measurements & Data Analysis
ME 3256: Aerospace Control Systems

Biomedical Track

BME 3500: Biomedical Engineering Measurements
BME 3600: Biomechanics
BME 4120: Neural Information Processing and Sensory Coding
BME 4130: Neural Prostheses
BME 4300: Physiological Control Systems
BME 4500: Bioinstrumentation