

Multidisciplinary Minor in Robotics Curriculum

Each student is required to complete the 7 courses in one of the tracks below (i.e., **one row** of the table), plus a multidisciplinary robotics senior design project, by taking ROBO410, ROBO420, and ROBO430¹³.

#	Track	1	2	3	4	5	6	7	Electives ¹¹ [tracks which may take each are listed in brackets]	
1	CSSE with Controls ^{1,2,3}	Intro to Robotics Programming (CSSE120R) ⁹	Mechatronics (ME430)	(DC Circ. (ECE203) + AC Circ. (ECE204)) OR (Elec. Sys. (ES203) + Elec. Eng. (ECE207))		Dynamical Systems (ECE205) ¹⁰	Mobile Robotics (ECE425)	Elec	Artificial Intelligence (CSSE 413) [1,3-5,9] Computer Vision (CSSE 461)[1-9] Image Recognition (CSSE 463)[1-9] Swarm Intelligence (CSSE 490)[1-3,5,9] Teamwork and Robotics (CSSE 290)[1-9] Linear Controls (ECE 320)[2,3] Signals and Systems(ECE 300)[1,2,3,8-9] Wireless Systems (ECE 414)[1-9] Mobile Robotics (ECE 425)[2,3] Advanced Dynamics(EM 502)[8-9] Intelligent Control Methods (ME 597)[1-9] Kinematics of Machinery (ME 403)[1,2,4-6] Control Systems (ME 406)[2,3] Robotics Engineering (ME 435)[1,4,6,7] Advanced Control Sys (ME 506)[1,3-9] Advanced Kinematics (ME 518)[3,7-9] Microsensors (EP 408)[1-5,7-9] Image Proc (ECE 480/PH 437)[1-9] if not used as req course for track 6 Adv Image Proc (ECE 582/PH 537)[1-9] Senior Capstone Design Credits above Major Requirements (ROBO410,420,430)[8-9]	
2	CSSE with Hardware ^{1,2}			(DC Circ. (ECE203) + AC Circ. (ECE204)) OR (Elec. Sys. (ES203) + Elec. Eng. (ECE207))		Robotics Engineering (ME435)	Artificial Intelligence (CSSE413)	Elec		
3	CSSE with Mechanics ^{1,2,4}			Conservation & Acct. Princ. (ES201)	Mechanical Systems (ES204)	Kinematics (ME403)	Robotics Engineering (ME435)	Elec		
4	CPE ⁵			Linear Control Systems (ECE320)	Data Structures and Analysis (CSSE230)	Statics & Mech. of Materials I (EM121)	Mobile Robotics (ECE425)	Elec		
5	EE with Programming ⁶			Object-oriented Software Dev (CSSE220)	Data Structures and Analysis (CSSE230)	Robotics Engineering (ME435)	Mobile Robotics (ECE425)	Elec		
6	ECE with Sensors ⁶			Optical Systems (OE295)	Microsensors (EP408)	Image Proc. (ECE480/PH437) or Wireless Sys. (ECE414)	Mobile Robotics (ECE425)	Elec		
7	ECE with Mechanics ⁶			Conservation & Acct. Princ. (ES201)	Mechanical Systems (ES204)	Kinematics (ME403)	Mobile Robotics (ECE425)	Elec		
8	ME with Electronics ^{7,8,12}			Kinematics (ME403)	Introduction to Logic Design (ECE130)	Electronic Device Modeling (ECE250)	Robotics Engineering (ME435)	Digital Systems (ECE333)		Extra Cap Des Cred (ROBO4x0)
9	ME with Programming ⁷			Kinematics (ME403)	Object-oriented Software Dev (CSSE220)	Data Structures and Analysis (CSSE230)	Robotics Engineering (ME435)	Mobile Robotics (ECE425)		Extra Cap Des Cred (ROBO4x0)

1. CSSE220,230 already required for CS and SE majors.
2. SE majors should pursue the corresponding domain track.
3. CSSE majors pursuing this track need only 1 additional class to obtain an ECE minor. To do that, they will need ECE203+ECE204.
4. Students in this track will need to obtain electronics experience to satisfy the ME430 prerequisites.
5. CSSE220, ECE130, ECE203, ECE204, ECE333 already required for CPE majors
6. ECE203, ECE204, ECE230, ECE320 already required for EE majors
7. ME430 already required for ME majors. **ME majors must also choose ME406 Controls, not Vibrations, as a restricted elective.**
8. Students in this track will need to take ECE203 and ECE204 instead of ES203 and ECE207, as a prerequisite for ECE250. This is a standard substitution.
9. CSSE221 (Honors) or CSSE120 can substitute here.
10. A student may substitute ME406 Controls. This currently requires a longer list of prerequisites.
11. This list is intended to exclude all robotics electives already required by the student's chosen major or track.
12. Students in this track need only 1 additional ECE class to obtain an ECE minor. To do that, they will need to take ECE203 + ECE204 instead of ES203 + ECE207.
13. ROBO410, 420 and 430 replaces ECE361, 460, 461, and 462 for ECE majors, ME471, 472, and 6 credit hours of technical electives for ME majors, and CSSE497, 498 and 499 for CSSE majors.

Color Key

Computer Science and Software Engineering
Electrical and Computer Engineering
Mechanical Engineering
Physics and Optical Engineering

Prerequisite analysis (to ensure every major can complete a track without overloading)

Major		1	2	3	4	5	6	7 Notes	Total electives
1 CSSE with Controls	CSSE120R replaces CSSE120	ME430 (FE)	ECE203 (TE)	ECE204 (TE)	ECE205 (FE)	ECE425 (FE)	Elec (AE)	Need PH113 (SciE), MA211 (TE). SE choose Robotics application domain track.	CS: 1 AE, 3 TE, 3 FE (2 FE remaining) SE: 1 AE, 1 TE, 5 FE (2 FE remaining)
2 CSSE with Hardware	CSSE120R replaces CSSE120	ME430 (FE)	ECE203 (TE)	ECE204 (TE)	ME435 (FE)	CSSE413 (AE)	Elec (AE)	Need PH113 (SciE). SE choose Robotics application domain track.	CS: 2 AE, 3 TE, 2 FE (3 FE remaining) SE: 1 AE, 1 TE, 5 FE (2 FE remaining)
3 CSSE with Mechanics	CSSE120R replaces CSSE120	ME430 (FE)	ES201 (FE)	ES204 (FE)	ME403 (FE)	ME435 (FE)	Elec (AE)	Need PH113 (SciE). SE choose Mech. Robotics application domain track.	CS: 1 AE, 1 TE, 5 FE (2 TE remaining) SE: 1 AE, 1 TE, 5 FE (2 FE remaining)
4 CPE	CSSE120R replaces CSSE120	ME430 (TE)	ECE320 (FE)	CSSE230 (TE)	EM121 (FE)	ECE425 (AE)	Elec (AE)	If elective is a 400+-level ECE course (an AE), then no overload is required.	2 AE, 2 TE, 2 FE (1 AE remaining)
5 EE with Programming	CSSE120R replaces CSSE120	ME430 (FE)	CSSE220 (TE)	CSSE230 (TE)	ME435 (FE)	ECE425 (AE)	Elec (AE)	If elective is a 400+-level ECE course (an AE), then no overload is required.	2 AE, 2 TE, 2 FE (1 AE remaining)
6 ECE with Sensors	CSSE120R replaces CSSE120	ME430 (TE)	OE295 (TE)	EP408 (FE)	ECE480/414 (AE)	ECE425 (AE)	Elec (FE)	If elective were 400+-level ECE course (an AE), then they would still have a FE instead of an AE.	2 AE, 2 TE, 2 FE (1 AE remaining)
7 ECE with Mechanics	CSSE120R replaces CSSE120	ME430 (TE)	ES201 (FE)	ES204 (FE)	ME403 (TE)	ECE425 (AE)	Elec (AE)	If elective is a 400+-level ECE course (an AE), then no overload is required.	2 AE, 2 TE, 2 FE (1 AE remaining)
8 ME with Electronics	CSSE120R replaces ME123	ME403 (TE)	ECE130 (FE)	ECE250 (TE)	ME435 (AE)	ECE333 (TE)	Sr Des. Credits (FE)		3 TE, 1 AE, 2 FE (none remaining)
9 ME with Programming	CSSE120R replaces ME123	ME403 (TE)	CSSE220 (FE)	CSSE230 (TE)	ME435 (AE)	ECE425 (FE)	Sr Des. Credits (TE)		3 TE, 1 AE, 2 FE (none remaining)

Key

AE = area elective

TE = technical elective

SciE = science elective

FE = free elective