ROBOTICS ENGINEERING (BS) / ROBOTICS ENGINEERING (MS) (COMBINED OPTION)

Program Map

BS/MS Robotics Engineering Non-Thesis Option 1

Course	Title		
First Year Fall			
ENGL 1101	English Composition I (minimum grade of C)		
MATH 1131	Calculus with Analytic Geometry I (minimum grade of C)		
CHEM 1211	Principles of Chemistry I (minimum grade of C)		
CHEM 1211L	Principles of Chemistry I Lab (minimum grade of C)	/ I Lab (minimum 1	
ENGR 1701	Introduction to Robotics (minimum grade of C)	obotics (minimum grade 1	
ENGR 2255	Engineering Graphics and Computer Aided Design (minimum grade of C)	led 3	
Area B2	Institutional Options Elective ¹	1	
	Credit Hours	16	
Spring			
ENGL 1102	English Composition II (minimum grade of C)	3	
MATH 1132	Calculus with Analytic Geometry II (minimum grade of C)		
PHYS 2211	Principles of Physics I (minimum grade of C)		
PHYS 2311	Principles of Physics I Lab (minimum grade of C)	e 1	
Area H	Elective (minimum grade of C) ²	3	
KINS 1106 or PHED 1205	Lifetime Wellness		
	Credit Hours	16	
Second Year Fall			
MATH 2115	Introduction to Linear Algebra (minimum grade of C)	3	
PHYS 2212	Principles of Physics II (minimum grade of C)	ade of 3	
PHYS 2312	Principles of Physics II Lab (minimum grade of C)	1	
ENGR 2115	Statics (minimum grade of C)	3	
ENGR 2221	Computing for Engineers 1 (minimum grade of C)		
Area E	Behavioral Science Elective ³	3	
	Credit Hours	16	

Spring		
MATH 3107	Differential Equations (minimum grade of C)	3
ENGR 2206	Digital Logic (minimum grade of C)	
ENGR 2125	Dynamics of Rigid Bodies (minimum grade of C)	
Area H	Elective (minimum grade of C) ²	
Area B1	Institutional Options Elective ⁴	3
Third Year	Credit Hours	16
Fall		
MATH 2135	Calculus with Analytic Geometry 3 (minimum grade of C)	4
ENGR 3235	Circuit Analysis (minimum grade of C)	3
ENGR 3236	Introduction to Signal Processing (minimum grade of C)	3
ENGR 5245U	minimum grade of C	2
Area C1	Humanities Elective ⁵	3
Spring	Credit Hours	15
MATH 3175	Introduction to Probability (minimum grade of C)	3
ENGR 3255	Sensors and Actuators (minimum grade of C)	3
ENGR 3275	Feedback Control Systems (minimum grade of C)	3
Area H	Elective (minimum grade of C) ²	3
PEDS	Physical Education course 1***	1
PEDS Area C2	Physical Education course 1*** Fine Arts Elective ⁶	
Area C2	Physical Education course 1***	1
Area C2 Fourth Year	Physical Education course 1*** Fine Arts Elective ⁶	1
Area C2 Fourth Year Fall	Physical Education course 1*** Fine Arts Elective ⁶ Credit Hours	1 3 16
Fourth Year Fall ENGR 4391	Physical Education course 1*** Fine Arts Elective ⁶ Credit Hours Robotics Senior Design 1 (minimum grade of C)	1 3 16
Fourth Year Fall ENGR 4391 ENGR 5161U	Physical Education course 1*** Fine Arts Elective ⁶ Credit Hours Robotics Senior Design 1 (minimum grade of C) Elements of Machine Intelligence (minimum grade of C)	1 3 16
Fourth Year Fall ENGR 4391 ENGR 5161U ENGR 5176U	Physical Education course 1*** Fine Arts Elective ⁶ Credit Hours Robotics Senior Design 1 (minimum grade of C) Elements of Machine Intelligence (minimum grade of C) Kinematics and Dynamics (minimum grade of C)	1 3 16 2 3
Fourth Year Fall ENGR 4391 ENGR 5161U ENGR 5176U ENGR 5236G	Physical Education course 1*** Fine Arts Elective ⁶ Credit Hours Robotics Senior Design 1 (minimum grade of C) Elements of Machine Intelligence (minimum grade of C) Kinematics and Dynamics (minimum grade of C) Microelectronic Circuits	1 3 16 2 3 3
Fourth Year Fall ENGR 4391 ENGR 5161U ENGR 5176U	Physical Education course 1*** Fine Arts Elective ⁶ Credit Hours Robotics Senior Design 1 (minimum grade of C) Elements of Machine Intelligence (minimum grade of C) Kinematics and Dynamics (minimum grade of C) Microelectronic Circuits American History ⁷	1 3 16 2 3 3 3
Fourth Year Fall ENGR 4391 ENGR 5161U ENGR 5176U ENGR 5236G Area E	Physical Education course 1*** Fine Arts Elective ⁶ Credit Hours Robotics Senior Design 1 (minimum grade of C) Elements of Machine Intelligence (minimum grade of C) Kinematics and Dynamics (minimum grade of C) Microelectronic Circuits	1 3 16 2 3 3
Fourth Year Fall ENGR 4391 ENGR 5161U ENGR 5176U ENGR 5236G Area E Spring	Physical Education course 1*** Fine Arts Elective 6 Credit Hours Robotics Senior Design 1 (minimum grade of C) Elements of Machine Intelligence (minimum grade of C) Kinematics and Dynamics (minimum grade of C) Microelectronic Circuits American History 7 Credit Hours	1 3 16 2 3 3 3 14
Fourth Year Fall ENGR 4391 ENGR 5161U ENGR 5176U ENGR 5236G Area E Spring ENGR 4392	Physical Education course 1*** Fine Arts Elective 6 Credit Hours Robotics Senior Design 1 (minimum grade of C) Elements of Machine Intelligence (minimum grade of C) Kinematics and Dynamics (minimum grade of C) Microelectronic Circuits American History 7 Credit Hours Robotics Senior Design 2 (minimum grade of C)	1 3 16 2 3 3 3 14
Fourth Year Fall ENGR 4391 ENGR 5161U ENGR 5176U ENGR 5236G Area E Spring ENGR 4392 ENGR 5238G	Physical Education course 1*** Fine Arts Elective 6 Credit Hours Robotics Senior Design 1 (minimum grade of C) Elements of Machine Intelligence (minimum grade of C) Kinematics and Dynamics (minimum grade of C) Microelectronic Circuits American History 7 Credit Hours Robotics Senior Design 2 (minimum grade of C) Introduction to Embedded Systems	1 3 16 2 3 3 3 14
Fourth Year Fall ENGR 4391 ENGR 5161U ENGR 5176U ENGR 5236G Area E Spring ENGR 4392 ENGR 5238G ENGR 5151U	Physical Education course 1*** Fine Arts Elective 6 Credit Hours Robotics Senior Design 1 (minimum grade of C) Elements of Machine Intelligence (minimum grade of C) Kinematics and Dynamics (minimum grade of C) Microelectronic Circuits American History 7 Credit Hours Robotics Senior Design 2 (minimum grade of C) Introduction to Embedded Systems Computer Vision 1 (minimum grade of C)	1 3 16 2 3 3 3 14 2 3 3
Fourth Year Fall ENGR 4391 ENGR 5161U ENGR 5176U ENGR 5236G Area E Spring ENGR 4392 ENGR 5238G ENGR 5238G ENGR 5151U POLS 1101	Physical Education course 1*** Fine Arts Elective 6 Credit Hours Robotics Senior Design 1 (minimum grade of C) Elements of Machine Intelligence (minimum grade of C) Kinematics and Dynamics (minimum grade of C) Microelectronic Circuits American History 7 Credit Hours Robotics Senior Design 2 (minimum grade of C) Introduction to Embedded Systems Computer Vision 1 (minimum grade of C) American Government	1 3 16 2 3 3 3 14 2 3 3 3
Fourth Year Fall ENGR 4391 ENGR 5161U ENGR 5176U ENGR 5236G Area E Spring ENGR 4392 ENGR 5238G ENGR 5151U	Physical Education course 1*** Fine Arts Elective 6 Credit Hours Robotics Senior Design 1 (minimum grade of C) Elements of Machine Intelligence (minimum grade of C) Kinematics and Dynamics (minimum grade of C) Microelectronic Circuits American History 7 Credit Hours Robotics Senior Design 2 (minimum grade of C) Introduction to Embedded Systems Computer Vision 1 (minimum grade of C) American Government World Cultures Elective 8	1 3 16 2 3 3 3 14 2 3 3 3 3
Fourth Year Fall ENGR 4391 ENGR 5161U ENGR 5176U ENGR 5236G Area E Spring ENGR 4392 ENGR 5238G ENGR 5151U POLS 1101 Area E	Physical Education course 1*** Fine Arts Elective 6 Credit Hours Robotics Senior Design 1 (minimum grade of C) Elements of Machine Intelligence (minimum grade of C) Kinematics and Dynamics (minimum grade of C) Microelectronic Circuits American History 7 Credit Hours Robotics Senior Design 2 (minimum grade of C) Introduction to Embedded Systems Computer Vision 1 (minimum grade of C) American Government	1 3 16 2 3 3 3 14 2 3 3 3
Fourth Year Fall ENGR 4391 ENGR 5161U ENGR 5176U ENGR 5236G Area E Spring ENGR 4392 ENGR 5238G ENGR 5151U POLS 1101 Area E Fifth Year	Physical Education course 1*** Fine Arts Elective 6 Credit Hours Robotics Senior Design 1 (minimum grade of C) Elements of Machine Intelligence (minimum grade of C) Kinematics and Dynamics (minimum grade of C) Microelectronic Circuits American History 7 Credit Hours Robotics Senior Design 2 (minimum grade of C) Introduction to Embedded Systems Computer Vision 1 (minimum grade of C) American Government World Cultures Elective 8	1 3 16 2 3 3 3 14 2 3 3 3 3
Fourth Year Fall ENGR 4391 ENGR 5161U ENGR 5176U ENGR 5236G Area E Spring ENGR 4392 ENGR 5238G ENGR 5151U POLS 1101 Area E Fifth Year Fall	Physical Education course 1*** Fine Arts Elective 6 Credit Hours Robotics Senior Design 1 (minimum grade of C) Elements of Machine Intelligence (minimum grade of C) Kinematics and Dynamics (minimum grade of C) Microelectronic Circuits American History 7 Credit Hours Robotics Senior Design 2 (minimum grade of C) Introduction to Embedded Systems Computer Vision 1 (minimum grade of C) American Government World Cultures Elective 8 Credit Hours	1 3 16 2 3 3 3 14 2 3 3 3 3 14
Fourth Year Fall ENGR 4391 ENGR 5161U ENGR 5176U ENGR 5236G Area E Spring ENGR 4392 ENGR 5238G ENGR 5151U POLS 1101 Area E Fifth Year Fall Area 1	Physical Education course 1*** Fine Arts Elective 6 Credit Hours Robotics Senior Design 1 (minimum grade of C) Elements of Machine Intelligence (minimum grade of C) Kinematics and Dynamics (minimum grade of C) Microelectronic Circuits American History 7 Credit Hours Robotics Senior Design 2 (minimum grade of C) Introduction to Embedded Systems Computer Vision 1 (minimum grade of C) American Government World Cultures Elective 8 Credit Hours Graduate Elective 9	1 3 16 2 3 3 3 14 2 3 3 3 3 14
Fourth Year Fall ENGR 4391 ENGR 5161U ENGR 5176U ENGR 5236G Area E Spring ENGR 4392 ENGR 5238G ENGR 5151U POLS 1101 Area E Fifth Year Fall	Physical Education course 1*** Fine Arts Elective 6 Credit Hours Robotics Senior Design 1 (minimum grade of C) Elements of Machine Intelligence (minimum grade of C) Kinematics and Dynamics (minimum grade of C) Microelectronic Circuits American History 7 Credit Hours Robotics Senior Design 2 (minimum grade of C) Introduction to Embedded Systems Computer Vision 1 (minimum grade of C) American Government World Cultures Elective 8 Credit Hours	1 3 16 2 3 3 3 14 2 3 3 3 3 14

ENGR 6399	Graduate Research Project	3
	Credit Hours	12
Spring		
Area 1	Graduate Elective ⁹	3
Area 1	Graduate Elective ⁹	3
Area 2	Graduate elective from Area 1 list ⁹	3
ENGR 6399	Graduate Research Project	3
	Credit Hours	12
	Total Credit Hours	147

Footnotes

Area B2: ITDS 1779 (2) or LEAD 1705 (2) or PERS 1506 (1; may be repeated with different topic) or PERS 1507 (2).

² Area H: ENGR 1000+, MATH/STAT 3000+, CPSC 3000+, MATH 2125, Science 1000+

- ³ ECON 2105 or ECON 2106 (recommended)
- ⁴ Area B1: COMM 1110 or FL 1001, 1002, 2001, 2002
- Area C1: ENGL 2111, 2112; ITDS 1145,1155, 2125; PHIL 2010
- ⁶ Area C2: ARTH 1100, 2125, 2126; ITDS 1145, MUSC 1100, THEA 1100
- ⁷ HIST 2111 or HIST 2112
- World Culture: ANTH 1105, 1107, 2105, 2136; HIST 1111, 1112; ENGL 2136, GEOG 1101, ITDS 1156
- ⁹ Area 1 Graduate electives:
 - ENGR 6137 Dynamic Optimization
 - ENGR 6145 Human-Robot Interactions
 - ENGR 6148 Military Applications in Robotics
 - ENGR 6152 Computer Vision 2
 - · ENGR 6162 Machine Intelligence and Synthesis
 - ENGR 6167 Multi-Robot Systems
 - ENGR 6172 Multivariable Linear Controls
 - ENGR 6173 Nonlinear Controls
 - ENGR 6178 Biomechanics
 - ENGR 6239 Embedded Systems Design
 - ENGR 6555 Selected Topics in Robotics
 - any 5000+ CPSC/MATH class with advisor approval

BS/MS Robotics Engineering Non-Thesis Option 2

Title	Credit Hours
English Composition I (minimum grade of C)	3
Calculus with Analytic Geometry I (minimum grade of C)	4
Principles of Chemistry I (minimum grade of C)	3
Principles of Chemistry I Lab (minimum grade of C)	1
Introduction to Robotics (minimum grade of C)	1
Engineering Graphics and Computer Aided Design (minimum grade of C)	3
	English Composition I (minimum grade of C) Calculus with Analytic Geometry I (minimum grade of C) Principles of Chemistry I (minimum grade of C) Principles of Chemistry I Lab (minimum grade of C) Introduction to Robotics (minimum grade of C) Engineering Graphics and Computer Aided

	Credit Hours	16
Spring		
ENGL 1102	English Composition II (minimum grade of C)	
MATH 1132	Calculus with Analytic Geometry II (minimum grade of C)	
PHYS 2211	Principles of Physics I (minimum grade of C)	
PHYS 2311	Principles of Physics I Lab (minimum grade of C)	
Area H	Elective (minimum grade of C) 2	3
KINS 1106	Lifetime Wellness	2
or PHED 1205	or Concepts of Fitness	
Second Year Fall	Credit Hours	16
MATH 2115	Introduction to Linear Algebra (minimum grade of C)	3
PHYS 2212	Principles of Physics II (minimum grade of C)	3
PHYS 2312	Principles of Physics II Lab (minimum grade of C)	1
ENGR 2115	Statics (minimum grade of C)	3
ENGR 2221	Computing for Engineers 1 (minimum grade of C)	3
Area E	Behavioral Science Elective ³	3
	Credit Hours	16
Spring		
MATH 3107	Differential Equations (minimum grade of C)	3
ENGR 2206	Digital Logic (minimum grade of C)	4
ENGR 2125	Dynamics of Rigid Bodies (minimum grade of C)	3
Area H	Elective (minimum grade of C) ²	3
Area B1	Institutional Options Elective ⁴	3
	Credit Hours	16
Third Year Fall		
MATH 2135	Calculus with Analytic Geometry 3 (minimum grade of C)	4
ENGR 3235	Circuit Analysis (minimum grade of C)	3
ENGR 3236	Introduction to Signal Processing (minimum grade of C)	3
ENGR 5245U	minimum grade of C	2
Area C1	Humanities Elective ⁵	3
	Credit Hours	15
Spring		
MATH 3175	Introduction to Probability (minimum grade of C)	3
ENGR 3255	Sensors and Actuators (minimum grade of C)	3
ENGR 3275	Feedback Control Systems (minimum grade of C)	3

Institutional Options Elective 1

Area B2

	Total Credit Hours	147
	Credit Hours	12
ENGR 6689	Supervised Graduate Internship	3
Area 2	Graduate elective from Area 1 list ⁹	3
Area 1	Graduate Elective ⁹	3
Area 1	Graduate Elective ⁹	3
Spring	Credit Hours	12
ENGR 6689	Supervised Graduate Internship	3
Area 1	Graduate Elective ⁹	3
Area 1	Graduate Elective ⁹	
Area 1	Graduate Elective 9	3
Fall		
Fifth Year	Credit Hours	14
Area E	World Cultures Elective 8	3
POLS 1101	American Government	
ENGR 5151U	Computer Vision 1 (minimum grade of C)	3
ENGR 5238G	Introduction to Embedded Systems	3
ENGR 4392	Robotics Senior Design 2 (minimum grade of C)	2
Spring		
	Credit Hours	14
Area E	American History ⁷	3
ENGR 5236G	Microelectronic Circuits	3
ENGR 5176U	Kinematics and Dynamics (minimum grade of C)	
ENGR 5161U	Elements of Machine Intelligence (minimum grade of C)	
ENGR 4391	Robotics Senior Design 1 (minimum grade of C)	2
Fourth Year Fall	orealt riours	10
7.1.00.02	Credit Hours	3 16
Area C2	Fine Arts Elective ⁶	
PFDS	Physical Education course 1***	
Area H	Elective (minimum grade of C) ²	3

Footnotes

- Area B2: ITDS 1779 (2) or LEAD 1705 (2) or PERS 1506 (1; may be repeated with different topic) or PERS 1507 (2)
- Area H: ENGR 1000+, MATH/STAT 3000+, CPSC 3000+, MATH 2125, Science 1000+
- ³ ECON 2105 or ECON 2106 (recommended)
- 4 Area B1: COMM 1110 or FL 1001, 1002, 2001, 2002
- ⁵ Area C1: ENGL 2111, 2112; ITDS 1145, 1155, 2125; PHIL 2010
- ⁶ Area C2: ARTH 1100, 2125. 2126; ITDS 1145, MUSC 1100, THEA 1100
- ¹ HIST 2111 or HIST 2112
- World Culture: ANTH 1105, 1107, 2105, 2136; HIST 1111, 1112; ENGL 2136, GEOL 1101, ITDS 1156
- ⁹ Area 1 Graduate electives:
 - · ENGR 6137 Dynamic Optimization
 - · ENGR 6145 Human-Robot Interactions
 - ENGR 6148 Military Applications in Robotics

- ENGR 6152 Computer Vision 2
- · ENGR 6162 Machine Intelligence and Synthesis
- · ENGR 6167 Multi-Robot Systems
- ENGR 6172 Multivariable Linear Controls
- · ENGR 6173 Nonlinear Controls
- · ENGR 6178 Biomechanics
- · ENGR 6239 Embedded Systems Design
- · ENGR 6555 Selected Topics in Robotics
- any 5000+ CPSC/MATH class with advisor approval

BS/MS Robotics Engineering Thesis Option

DO/ INIO 110001	ios Engineering Thesis option		
Course	Title		
First Year			
Fall			
ENGL 1101	English Composition I (minimum grade of C)	3	
MATH 1131	Calculus with Analytic Geometry I (minimum grade of C)		
CHEM 1211	Principles of Chemistry I (minimum grade of C)		
CHEM 1211L	Principles of Chemistry I Lab (minimum grade of C)	(minimum 1	
ENGR 1701	Introduction to Robotics (minimum grade of C)	1	
ENGR 2255	Engineering Graphics and Computer Aided Design (minimum grade of C)	3	
Area B2	Institutional Options Elective ¹	1	
	Credit Hours	16	
Spring			
ENGL 1102	English Composition II (minimum grade of C)	3	
MATH 1132	Calculus with Analytic Geometry II (minimum grade of C)	4	
PHYS 2211	Principles of Physics I (minimum grade of C)	3	
PHYS 2311	Principles of Physics I Lab (minimum grade of C)	1	
Area H	Elective (minimum grade of C) ²	3	
KINS 1106 or PHED 1205	Lifetime Wellness or Concepts of Fitness		
	Credit Hours	16	
Second Year Fall			
MATH 2115	Introduction to Linear Algebra (minimum grade of C)	3	
PHYS 2212	Principles of Physics II (minimum grade of C)	3	
PHYS 2312	Principles of Physics II Lab (minimum grade of C)	1	
ENGR 2115	Statics (minimum grade of C)	3	
ENGR 2221	Computing for Engineers 1 (minimum grade of C)	3	

Robotics Engineering (BS) / Robotics Engineering (MS) (Combined Option)

A 5	Data with a lock on a floor in 3	3
Area E	Behavioral Science Elective ³	
Consider as	Credit Hours	16
Spring	Differential Equations (minimum grade of	3
MATH 3107	Differential Equations (minimum grade of C)	
ENGR 2206	Digital Logic (minimum grade of C)	
ENGR 2125	Dynamics of Rigid Bodies (minimum grade of C)	
Area H	Elective (minimum grade of C) ²	
Area B1	Institutional Options Elective ⁴	
	Credit Hours	16
Third Year Fall		
MATH 2135	Calculus with Analytic Geometry 3 (minimum grade of C)	
ENGR 3235	Circuit Analysis (minimum grade of C)	3
ENGR 3236	Introduction to Signal Processing	3
	(minimum grade of C)	
ENGR 5245U	minimum grade of C	2
Area C1	Humanities Elective ⁵	3
	Credit Hours	15
Spring		
MATH 3175	Introduction to Probability (minimum grade of C)	3
ENGR 3255	Sensors and Actuators (minimum grade of C)	
ENGR 3275	Feedback Control Systems (minimum grade of C)	
Area H	Elective (minimum grade of C) ²	3
PEDS	Physical Education course 1***	1
Area C2	Fine Arts Elective ⁶	3
	Credit Hours	16
Fourth Year		
Fall		
ENGR 4391	Robotics Senior Design 1 (minimum grade of C)	2
ENGR 5161U	Elements of Machine Intelligence (minimum grade of C)	
ENGR 5176U	Kinematics and Dynamics (minimum grade of C)	
ENGR 5236G	Microelectronic Circuits	
Area E	American History ⁷	3
	Credit Hours	14
Spring		
ENGR 4392	Robotics Senior Design 2 (minimum grade of C)	2
ENGR 5238G	Introduction to Embedded Systems	
ENGR 5151U	Computer Vision 1 (minimum grade of C)	3
POLS 1101	American Government	3
Area E	World Cultures Elective ⁸	3
	Credit Hours	14
Fifth Year Fall		
Area 1	Graduate Elective ⁹	3

Area 1	Graduate Elective ⁹	3
Area 1	Graduate Elective ⁹	3
ENGR 6999	Thesis Research	3
	Credit Hours	12
Spring		
Area 1	Graduate Elective ⁹	3
Area 1	Graduate Elective ⁹	3
ENGR 6999	Thesis Research	3
ENGR 6999	Thesis Research	3
ENGR 6000	Thesis Defense	0
	Credit Hours	12
	Total Credit Hours	147

Footnotes

- ¹ Area B2: ITDS 1779 (2) or LEAD 1705 (2) or PERS 1506 (1; may be repeated with different topic) or PERS 1507 (2)
- Area H: ENGR 1000+, MATH/STAT 3000+, CPSC 3000+, MATH 2125,
 Science 1000+
- $^{3}\,$ ECON 2105 or ECON 2106 (recommended)
- ⁴ B1: COMM 1110 or FL 1001, 1002, 2001, 2002
- ⁵ Area C1: ENGL 2111, 2112; ITDS 1145, 1155, 2125; PHIL 2010
- $^6\,$ Area C2: ARTH 1100, 2125, 2126; ITDS 1145, MUSC 1100, THEA 1100
- ⁷ HIST 2111 or HIST 2112
- World Culture: ANTH 1105, 1107, 2105, 2136; HIST 1111, 1112; ENGL 2136, GEOG 1101, ITDS 1156
- ⁹ Area 1 Graduate electives:
 - ENGR 6137 Dynamic Optimization
 - · ENGR 6145 Human-Robot Interactions
 - ENGR 6148 Military Applications in Robotics
 - ENGR 6152 Computer Vision 2
 - · ENGR 6162 Machine Intelligence and Synthesis
 - ENGR 6167 Multi-Robot Systems
 - ENGR 6172 Multivariable Linear Controls
 - ENGR 6173 Nonlinear Controls
 - ENGR 6178 Biomechanics
 - ENGR 6239 Embedded Systems Design
 - ENGR 6555 Selected Topics in Robotics
 - any 5000+ CPSC/MATH class with advisor approval