

NAME: _____

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CSCI-1100	Computer Science I	4		ENGR-1200 or ENGR-1400	Eng. Graphics & CAD ¹ or Eng. Communications ¹	1	
MATH-1010	Calculus I	4			Science Elective ⁵	4	
ECSE-1010	Intro. to ECSE ⁷	4		MATH-1020	Calculus II	4	
	Hum., Arts or Soc. Sci. El.	4		PHYS-1100	Physics I	4	
					Hum., Arts or Soc. Sci. El.	4	
MATH-2400	Intro. to Differential Eqns.	4		ENGR-2350	Embedded Control	4	
PHYS-1200	Physics II	4		ECSE-2010	Electric Circuits	4	
	Multidisciplinary Elective ¹	4		ECSE-2610	Cptr. Comp. & Operations	4	
	Hum., Arts or Soc. Sci. El.	4		MATH-2010	Multivar Calc & Matrix Alg	4	
ENGR-2050	Intro. to Eng. Design	4		ECSE-2900	ECSE Enrichment Seminar	1	
ECSE-2050	Intro. to Electronics	4		ECSE-2100	Fields & Waves I	4	
ECSE-2410	Signals & Systems	3		ECSE-2210	Microelectronics Tech.	3	
ECSE-2500	Engineering Probability	3		ECSE-2110	Electrical Energy Systems	3	
	Professional Devel. II ^{1,3}	2			Free Elective ²	3-4	
ENGR-4010	Professional Devel. III ¹	1			Restricted Elective ^{1,4,6}	3	
ECSE-4900	Multidisc. Capstone Dsgn ¹	3			Restricted Elective ^{1,4,6}	3	
	Lab Elective ^{1,4}	3-4			Free Elective ^{1,2}	3-4	
	Technical Elective ^{1,4,6}	3-4			Free Elective (if needed) ²	3-4	
	Free Elective ^{1,2}	3-4			Hum., Arts or Soc. Sci. El.	4	
	Hum., Arts or Soc. Sci. El.	4					

¹ May be taken either term.² The free electives must total to at least 12 credits.³ This course will be fulfilled from a list published at the start of each semester.⁴ It is recommended that students use electives to form a concentration. See the ECSE web page for concentration listings.⁵ Students who wish to take ENGR-1600 Materials Science for Engineers as their Multidisciplinary Elective must take CHEM-1100.⁶ No more than one Independent Study course may be used to when satisfying the combined Technical and Restricted Elective requirements.⁷ May be replaced with ENGR-1100 Introduction to Engineering Analysis**128 credits minimum****RESTRICTED ELECTIVE**

Any 3 or 4 credit hour course with the designation ECSE 4xxx or ECSE 6xxx

TECHNICAL ELECTIVE

Any 3 or 4 credit hour course in engineering, mathematics, or science at the 4000 level or higher.

MULTIDISCIPLINARY ELECTIVESENGR-1600 Materials Science for Eng.
ENGR-2090 Engineering Dynamics
ENGR-2250 Thermal & Fluids Eng. I
ENGR-2530 Strength of Materials**LAB ELECTIVES**ENGR-4710 Manufacturing Proc. Lab I
ECSE-4090 Mechatronics
ECSE-4130 Electric Power Eng. Lab
ECSE-4220 VLSI Design
ECSE-4760 Real-Time Cntrl & Comm.
ECSE-4770 Cptr H'ware Design
ECSE-4790 Microprocessor Systems**SCIENCE ELECTIVE**CHEM-1100 Chemistry I
BIOL-1010 Introduction to Biology
BIOL-2120 Cell and Molecular Bio.

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ENGR-1200 or ENGR-1400	Eng. Graphics & CAD ¹ or Eng. Communications ¹	1			Science Elective	4	
ECSE-1010	Intro. to ECSE ⁷	4		MATH-1020	Calculus II	4	
MATH-1010	Calculus I	4		CSCI-1200	Data Structures	4	
CSCI-1100	Computer Science I	4			Hum., Arts or Soc. Sci. El	4	
	Hum., Arts or Soc. Sci. El.	4					
ENGR-2350	Embedded Control	4		ECSE-2660	Cptr Arch, Nets, & Op Sys	4	
ECSE-2610	Cptr. Comp. & Operations	4		MATH-2400	Intro. to Differential Eqns	4	
CSCI-2200	Foundations of Comp. Sci.	4		PHYS-1200	Physics II	4	
PHYS-1100	Physics I	4		CSCI-2300	Introduction to Algorithms	4	
ECSE-2900	ECSE Enrichment Seminar	1		ECSE-2410	Signals & Systems	3	
ENGR-2050	Intro. to Eng. Design	4		ECSE-2050	Intro. to Electronics	4	
ECSE-2010	Electric Circuits	4		ECSE-2500	Engineering Probability	3	
MATH-2010	Multivar Calc & Matrix Alg.	4			Free Elective ²	3-4	
	Hum., Arts or Soc. Sci. El.	4			Hum., Arts or Soc. Sci. El.	4	
ENGR-4010	Professional Devel. III ¹	1			Professional Devel. II ^{1,3,4}	2	
	Technical Elective ^{1,5,6}	3-4			Restricted Elective ^{1,5,6}	3-4	
	Restricted Elective ^{1,5,6}	3-4		ECSE-4900	Multidisc. Capstone Dsgn ¹	3	
	Computer Eng Elective ⁴	3-4			Free Elective ^{1,2}	3-4	
	Free Elective ^{1,2}	3-4			Hum., Arts or Soc. Sci. El.	4	
					Free Elective (if needed) ²	3-4	

- ¹ May be taken either term.
- ² The free electives must total at least 12 credits.
- ³ This course will be fulfilled from a list published at the start of each semester.
- ⁴ May be taken in the third year.
- ⁵ It is recommended that students use electives to form a concentration. See the ECSE web page for concentration listings.
- ⁶ No more than one Independent Study course may be used when satisfying the combined Technical and Restricted Elective requirements.
- ⁷ May be replaced with ENGR-1100 Introduction to Engineering Analysis

130 credits minimum

RESTRICTED ELECTIVE

Any 3 or 4 credit hour course with the designation ECSE 4xxx, ECSE 6xxx, CSCI 4xxx, or CSCI 6xxx

TECHNICAL ELECTIVE

Any course in engineering, mathematics, or science at the 4000 level or higher.

COMPUTER ENGINEERING ELECTIVES

- ECSE-4670 Comp. Comm. Networks
- ECSE-4750 Computer Graphics
- ECSE-4770 Computer Hardware Design
- ECSE-4790 Microprocessor Systems
- CSCI-4380 Database Systems
- CSCI-4440 Software Dsg & Doc

SCIENCE ELECTIVE

- CHEM-1100 Chemistry I
- BIOL-1010 Introduction to Biology
- BIOL-2120 Cell and Molecular Bio.

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ECSE-1010	Intro. to ECSE ³	4		ENGR-1200 or ENGR-1400	Eng. Graphics & CAD ¹ or Eng. Communications ¹	1	
CSCI-1100	Computer Science I	4		MATH-1020	Calculus II	4	
MATH-1010	Calculus I	4		CHEM-1100	Chemistry I	4	
	Hum., Arts or Soc. Sci. El.	4		PHYS-1100	Physics I	4	
					Hum., Arts or Soc. Sci. El.	4	
ENGR-2050	Intro. to Eng. Design	4		ENGR-2350	Embedded Control	4	
MATH-2400	Intro. to Differential Eqns.	4		ECSE-2010	Electric Circuits	4	
PHYS-1200	Physics II	4		ECSE-2610	Cptr. Comp. & Operations	4	
BIOL-1010	Intro. to Biology ¹	4		MATH-2010	Multivar. Calc. & Matrix Alg.	4	
ECSE-2900	ECSE Enrichment Seminar	1		ECSE-2210	Microelectronics Tech.	3	
ECSE-2050	Intro. to Electronics	4		PHYS-2220	Quantum Physics II	4	
ECSE-2410	Signals & Systems	3		PHYS-4210	Electromagnetic Theory	4	
PHYS-2210	Quantum Physics I	4		ECSE-2110	Electrical Energy Systems	3	
MATH-4600	Advanced Calculus	4			Hum., Arts or Soc. Sci. El.	4	
ECSE-2500	Engineering Probability	3					
ENGR-4010	Professional Devel. III ¹	1			Professional Devel. II ^{1,2}	2	
ECSE-4220	VLSI Design	3		ECSE-4900	Multidisc. Capstone Dsgn ¹	3	
PHYS-2330	Theoretical Mechanics	4		PHYS-4420	Thermody. & Stat. Mechanics	4	
PHYS-2350	Experimental Physics	4			EE Restricted Elective	3	
	Microelectronics Elective ¹	3-4			Hum., Arts or Soc. Sci. El.	4	
	Hum., Arts or Soc. Sci. El.	4					

¹ May be taken either term.² May be taken in the third year³ May be replaced with ENGR-1100 Introduction to Engineering Analysis**137 credits minimum**

* EE must be your first named major. Otherwise an additional 2 credit hours of H&SS are required.

MICROELECTRONICS ELECTIVE

ECSE-4080 Semiconductor Pwr Electronics

ECSE-4250 Int. Ckt. Process & Design

ECSE-4720 Solid-State Physics

EE RESTRICTED ELECTIVE

Any 3 or 4 credit hour course with the designation ECSE 4xxx or ECSE 6xxx

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ECSE-1010	Intro. to ECSE ⁵	4		ENGR-1200 or ENGR-1400	Eng. Graphics & CAD ¹ or Eng. Communications ¹	1	
MATH-1010	Calculus I	4		MATH-1020	Calculus II	4	
CSCI-1100	Computer Science I	4			Science Elective ⁴	4	
	Hum., Arts or Soc. Sci. El.	4		CSCI-1200	Data Structures	4	
					Hum., Arts or Soc. Sci. El.	4	
ENGR-2350	Embedded Control	4		ECSE-2660	Cptr Arch, Nets, & Op Sys	4	
ECSE-2610	Cptr. Comp. & Operations	4		MATH-2400	Intro. to Differential Eqns	4	
CSCI-2200	Foundations of Comp. Sci.	4		CSCI-2300	Introduction to Algorithms	4	
PHYS-1100	Physics I	4		PHYS-1200	Physics II	4	
ENGR-2050	Intro. to Eng. Design	4		ECSE-2900	ECSE Enrichment Seminar	1	
ECSE-2010	Electric Circuits	4		ECSE-2050	Intro. to Electronics	4	
	Multidisc. Elective ¹	4		ECSE-2100	Fields & Waves I	4	
MATH-2010	Multivar Calc & Matrix Alg	4		ECSE-2410	Signals & Systems	3	
	Hum., Arts or Soc. Sci. El.	4		ECSE-2500	Engineering Probability	3	
				ECSE-2110	Electrical Energy Systems	3	
ENGR-4010	Professional Devel. III ¹	1			Professional Devel. II ^{1,2}	2	
ECSE-2210	Microelectronics Tech.	3		ECSE-4900	Multidisc. Capstone Dsgn ¹	3	
	Computer Eng Elective ¹	3-4			Restricted Elective ^{1,3}	3-4	
	Lab Elective ^{1,3}	3-4			Restricted Elective ^{1,3}	3-4	
	Technical Elective ^{1,3}	3-4			Hum., Arts or Soc. Sci. El.	4	
	Hum., Arts or Soc. Sci. El.	4					

¹ May be taken either term.² May be taken in the third year³ It is recommended that students use electives to form a concentration. See the ECSE web page for concentration listings.⁴ Students who wish to take ENGR-1600 Materials Science for Engineers as their Multidisciplinary Elective must take CHEM-1100.⁵ May be replaced with ENGR-1100 Introduction to Engineering Analysis**135 credits minimum****RESTRICTED ELECTIVE**

Any 3 or 4 credit hour course with the designation ECSE 4xxx, ECSE 6xxx, CSCI 4xxx, or CSCI 6xxx

TECHNICAL ELECTIVE

Any 3 or 4 credit hour course in engineering, mathematics, or science at the 4000 level or higher.

MULTIDISCIPLINARY ELECTIVESENGR-1600 Materials Science for Eng.
ENGR-2090 Engineering Dynamics
ENGR-2250 Thermal & Fluids Eng. I
ENGR-2530 Strength of Materials**COMPUTER ENGINEERING ELECTIVES**ECSE-4670 Comp. Comm. Networks
ECSE-4750 Computer Graphics
ECSE-4790 Microprocessor Systems
CSCI-4380 Database Systems
CSCI-4440 Software Dsg & Doc**LAB ELECTIVES**ENGR-4710 Manufacturing Proc. Lab I
ECSE-4090 Mechatronics
ECSE-4160 Electric Power Eng. Lab
ECSE-4220 VLSI Design
ECSE-4760 Real-Time Cntrl & Comm.
ECSE-4770 Cptr. H'ware Design
ECSE-4790 Microprocessr Sys**SCIENCE ELECTIVE**CHEM-1100 Chemistry I
BIOL-1010 Introduction to Biology
BIOL-2120 Cell and Molecular Bio.

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ECSE-1010	Intro. to ECSE ⁴	4		MATH-1020	Calculus II	4	
ENGR-1200 or ENGR-1400	Eng. Graphics & CAD ¹ or Eng. Communications ¹	1		CSCI-1200	Data Structures	4	
MATH-1010	Calculus I	4		BIOL-1010	Intro. to Biology ¹	3	
CSCI-1100	Computer Science I	4		BIOL-1015	Intro. to Biology Lab	1	
	Hum., Arts or Soc. Sci. El.	4			Hum., Arts or Soc. Sci. El.	4	
ENGR-2350	Embedded Control	4		ECSE-2660	Cptr Arch, Nets, & Op Sys	4	
ECSE-2610	Cptr. Comp. & Operations	4		PHYS-1200	Physics II	4	
CSCI-2200	Foundations of Comp. Sci.	4		MATH-2400	Intro. to Differential Eqns	4	
PHYS-1100	Physics I	4		CSCI-2300	Introduction to Algorithms	4	
ECSE-2900	ECSE Enrichment Seminar	1		ECSE-2410	Signals & Systems	3	
ENGR-2050	Intro. to Eng. Design	4		CSCI-4430	Programming Languages	4	
ECSE-2010	Electric Circuits	4		CSCI-4210	Operating Systems	4	
CSCI-2600	Principles of Software	4		ECSE-2050	Introduction to Electronics	4	
	Hum., Arts or Soc. Sci. El.	4		ECSE-2500	Engineering Probability	3	
ENGR-4010	Professional Devel. III ¹	1			Professional Devel. II ^{1,2}	2	
	Free Elective ³			ECSE-4900	Multidisc. Capstone Dsgn ¹	3	
MATH-2010	Multivar Calc & Matrix Alg.	4			CSCI Option/Capstone ¹	3-4	
	CSCI Option/Capstone ¹	3-4			CSCI Option/Capstone ¹	3-4	
	Hum., Arts or Soc. Sci. El.	4			Hum., Arts or Soc. Sci. El.	4	

¹ May be taken either term.² May be taken in the third year³ If necessary to make the program must total at least 128 credit hours.⁴ May be replaced with ENGR-1100 Introduction to Engineering Analysis

* CSE must be your first named major. Otherwise an additional 2 credit hours of H&SS are required.

130 credits minimum**CSCI OPTION**

Courses of three or four credits at the 4000 or 6000 level. For this purpose, courses in the series CSCI 4xxx, CSCI 6xxx, ECSE 46xx, and ECSE 47xx may be used, excluding ECSE 4630, ECSE 4640, ECSE 4720, and reading and independent study courses. The Pass/No Credit option cannot be used for these courses.

CSCI CAPSTONE

A culminating experience selected from one of the two categories below (note that the P/NC option cannot be used for any of the courses below):

1. Software-focused capstone consisting of either (a) the CSCI 4440 Software Design and Documentation course or (b) a 4-credit RCOS Capstone project for students who have already satisfactorily participated in RCOS in a prior semester. The RCOS

Capstone project entails criteria agreed upon by the Undergraduate Curriculum Committee (UCC) and RCOS directors, including leading an RCOS project, serving as an RCOS mentor, publishing an open source project, etc.

2. Coursework concentration capstone consisting of three 4000- or 6000-level CSCI courses in one of the following topic areas: (a) Theory and Mathematics; (b) Systems and Software Engineering; (c) Artificial Intelligence and Data; and (d) Vision, Graphics, Robotics, and Games. All 4000- and 6000-level CSCI catalog courses that are not part of the required undergraduate core are assigned to one or more topic areas.

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ENGR-1200	Eng. Graphics & CAD ¹	1		ENGR-1300	Engineering Processes ¹	1	
ENGR-1100	Intro. to Eng. Analysis	4		CSCI-1100	Computer Science I	4	
MATH-1010	Calculus I	4		MATH-1020	Calculus II	4	
CHEM-1100	Chemistry I	4		PHYS-1100	Physics I	4	
	Hum., Arts or Soc. Sci. El.	4			Hum., Arts or Soc. Sci. El.	4	
ENGR-2050	Intro. to Eng. Design	4		ECSE-2010	Electric Circuits	4	
ENGR-2350	Embedded Control	4		ECSE-2610	Cptr. Comp. & Operations	4	
ENGR-2530	Strength of Materials	4		ENGR-2090	Engineering Dynamics	4	
MATH-2400	Intro. to Differential Eqns.	4		ENGR-2250	Thermal and Fluids Eng I	4	
PHYS-1200	Physics II	4		MATH-2010	Multivar Calc & Matrix Alg	4	
ECSE-2900	ECSE Enrichment Seminar	1		ECSE-2100	Fields & Waves I	4	
ECSE-2050	Intro. to Electronics	4		ECSE-2210	Microelectronics Tech.	3	
ECSE-2410	Signals & Systems	3		MANE	Mechanical Eng. Core Mod.	6	
ECSE-2500	Engineering Probability	3		ECSE-2110	Electrical Energy Systems	3	
MANE	Mechanical Eng. Core Mod	6			Professional Devel. II ¹	2	
ENGR-4010	Professional Devel. III ¹	1			Design Elective ¹	3	
ENGR-1600	Materials Science for Eng	4			ECSE Restricted Elective ¹	3	
	ECSE Lab Elective ¹	3-4			MANE Technical Elective	3	
	MANE Computational Elec.	3			Hum., Arts or Soc. Sci. El.	4	
	ECSE Restricted Elective ¹	3			Hum., Arts or Soc. Sci. El.	4	
	Hum., Arts or Soc. Sci. El.	4					

- ¹ May be taken either term.
² The free electives must total to at least 12 credits.
³ Students are encouraged to select a life science course, such as BIOL-1010.

141 credits minimum

ECSE RESTRICTED ELECTIVE
 Any 3 or 4 credit hour course with the designation ECSE 4xxx or ECSE 6xxx

MANE COMPUTATIONAL ELECTIVE
 MANE-4240 Intro Finite Elements
 MANE-4963 Intro Comp Fluid Dynamics
 MANE-4280 Dsgn Optimization: Theory and Practice
 MTLE-4500 Comp. Methods for Materials Dsgn

MANE TECHNICAL ELECTIVE
 MANE-4xxx, MANE-6xxx, or a course from the following list. If one of the courses below is used, you can omit one ECSE Restricted Elective, reducing the total credit hours for the dual degree.
 ECSE-4090 Mechatronics
 ECSE-4120 Electromechanics
 ECSE-4080 Robotics I
 ECSE-4090 Robotics II

MANE CORE MODULES
 Thermal and Fluids Module:
 MANE-4010 Therm & Fluids Eng II
 MANE-4020 Therm & Fluids Eng. Lab.

Mechanical Design Module:
 MANE-4030 Elem. of Mech. Dsgn.
 MANE-4040 Mech. Dsgn. Lab

ECSE LAB ELECTIVES
 ENGR-4710 Manufacturing Proc. Lab I
 ECSE-4090 Mechatronics
 ECSE-4160 Electric Power Eng. Lab
 ECSE-4220 VLSI Design
 ECSE-4760 Real-Time Cntrl & Comm.
 ECSE-4770 Cptr H'ware Design
 ECSE-4790 Microprocessor Systems

DESIGN ELECTIVES
 ECSE-4900 Multidisc Cap Dsgn (F, S)
 MANE-4260 Multidisc Cap Dsgn (F, S)