Electrical Engineering Curriculum Checklist

	First Year							
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 [6]	4			MATH-1020	Calculus II	4	
	Hum., Arts or Soc. Sci. Elective	4			PHYS-1100	Physics I	4	
						Hum., Arts or Soc. Sci. Elective	4	
	Second Year							
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	
	Hum., Arts or Soc. Sci. El.	4			MATH-2010	Multivariable Calc & Matrix Algebra	4	
SUMMER ARCH SEMESTER			**Third Year**		**Fall or Spring**			
ECSE-2050	Intro. to Electronics	4			ECSE-2900	ECSE Enrichment Seminar	1	
ECSE-2410	Signals & Systems	3			ECSE-2100	Fields & Waves I	4	
ECSE-2500	Engineering Probability	3			ECSE-2210	Microelectronics Tech.	3	
	Professional Development II [3]	2			ECSE-2110	Electrical Energy Systems	3	
	Free Elective [2]	3-4				Math/Science Elective	4	
	Fourth Year							
ENGR-4010	Professional Development III [1]	1				Restricted Elective [1,4,5]	3	
ECSE-4900	Multidisc. Capstone Design [1]	3				Restricted Elective [1,4,5]	3	
	Lab Elective [1,4]	3-4				Free Elective [1,2]	3-4	
	Technical Elective [1,4,5]	3-4				Free Elective (if needed) [2]	3-4	
	Free Elective [1,2]	3-4				Hum., Arts or Soc. Sci. Elective	4	
	Hum., Arts or Soc. Sci. Elective	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 No more than one Independent Study course may be used to when satisfying the combined Technical and Restricted Elective requirements.
6 May be replaced with ENGR-1100 Introduction to Engineering Analysis

128 credits minimum

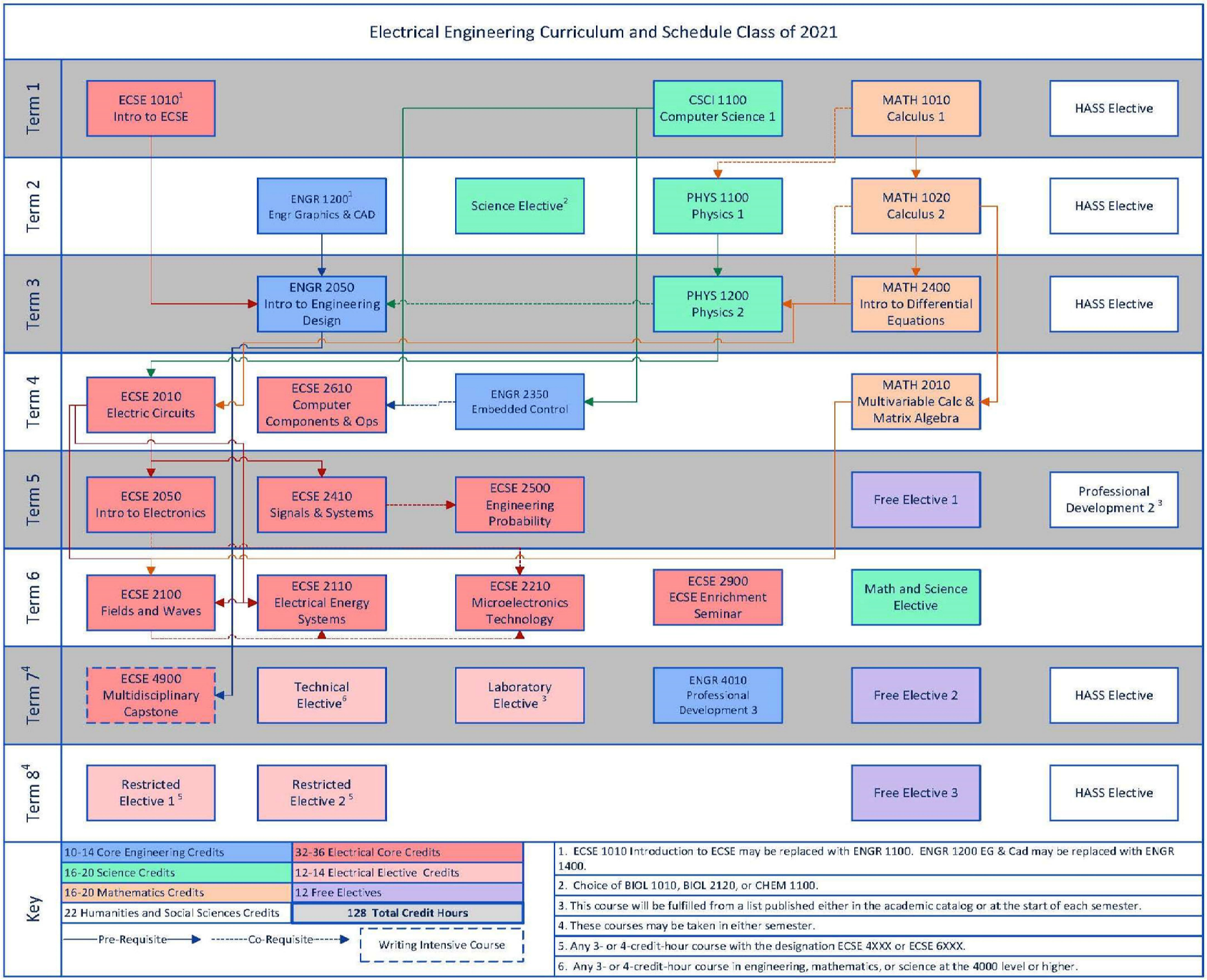
RESTRICTED ELECTIVE
Any 3 or 4 credit hour course with the designation ECSE-4xxx or ECSE-6xxx.

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

LAB ELECTIVES
ENGR-4710 Adv. Manufacturing 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.

MATH/SCIENCE ELECTIVE
A 4-credit-hour course (or a 3-credit-hour course with a 1-credit-hour laboratory) in Science (ASTR, BIOL, CHEM, ERTH, PHYS) or Mathematics (MATH, MATP). An independent Study course cannot be used to satisfy this requirement.


Electrical Engineering Curriculum and Schedule Class of 2021
Term 1
ECSE 1010[1] Intro to ECSE
CSCI 1100 Computer Science 1
MATH 1010 Calculus 1
HASS Elective
Term 2
ENGR 1200[1] Engr Graphics & CAD
Science Elective[2]
PHYS 1100 Physics 1
MATH 1020 Calculus 2
HASS Elective
Term 3
ENGR 2050 Intro to Engineering Design
PHYS 1200 Physics 2
MATH 2400 Intro to Differential Equations
HASS Elective
Term 4
ECSE 2010 Electric Circuits
ECSE 2610 Computer Components & Ops
ENGR 2350 Embedded Control
MATH 2010 Multivariable Calc & Matrix Algebra
Term 5
ECSE 2050 Intro to Electronics
ECSE 2410 Signals & Systems
ECSE 2500 Engineering Probability
Free Elective 1
Professional Development 2[3]
Term 6
ECSE 2100 Fields and Waves
ECSE 2110 Electrical Energy Systems
ECSE 2210 Microelectronics Technology
ECSE 2900 ECSE Enrichment Seminar
Math and Science Elective
Term 7[4]
ECSE 4900 Multidisciplinary Capstone
Technical Elective[6]
Laboratory Elective[3]
ENGR 4010 Professional Development 3
Free Elective 2
HASS Elective
Term 8[4]
Restricted Elective 1[5]
Restricted Elective 2[5]
Free Elective 3
HASS Elective
Key
10-14 Core Engineering Credits
16-20 Science Credits
16-20 Mathematics Credits
22 Humanities and Social Sciences Credits
32-36 Electrical Core Credits
12-14 Electrical Elective Credits
12 Free Electives
128 Total Credit Hours
Pre-Requisite
Co-Requisite
Writing Intensive Course
1. ECSE 1010 Introduction to ECSE may be replaced with ENGR 1100. ENGR 1200 EG & Cad may be replaced with ENGR 1400.
2. Choice of BIOL 1010, BIOL 2120, or CHEM 1100.
3. This course will be fulfilled from a list published either in the academic catalog or at the start of each semester.
4. These courses may be taken in either semester.
5. Any 3- or 4-credit-hour course with the designation ECSE 4XXX or ECSE 6XXX.
6. Any 3- or 4-credit-hour course in engineering, mathematics, or science at the 4000 level or higher.

Computer and Systems Engineering Curriculum Checklist

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

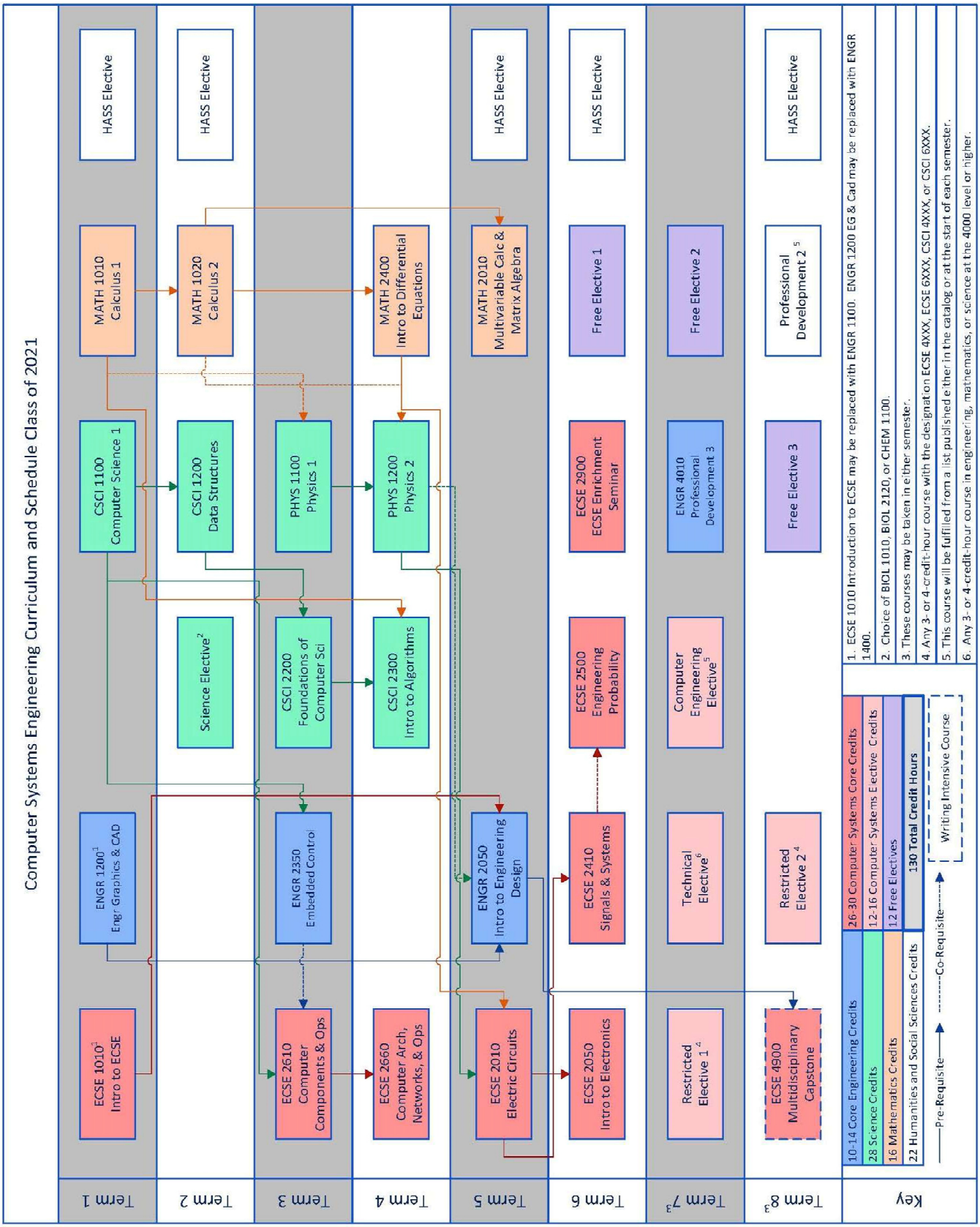
1 May be taken either term.
2 The free electives must total at least 12 credits.
3 This course will be fulfilled from a list published at the start of each semester.
4 May be taken in the third year.
5 It is recommended that students use electives to form a concentration. See the ECSE Web page for concentration 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.

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.

COMPUTER ENGINEERING ELECTIVES
ECSE-4670 Computer Comm. Networks
ECSE-4750 Computer Graphics
ECSE 4740 - Applied Parallel Computing for Engineers
ECSE-4770 Computer Hardware Design
ECSE-4790 Microprocessor Systems
CSCI-4380 Database Systems
CSCI-4440 Software Design & Doc

SCIENCE ELECTIVE
BIOL-1010 Introduction to Biology
BIOL-2120 Intro to Cell and Molecular Biology
CHEM-1100 Chemistry I


Computer Systems Engineering Curriculum and Schedule Class of 2021
Term 1
Term 2
Term 3
Term 4
Term 5
Term 6
Term 7[3]
Term 8[3]
ECSE 1010[1] Intro to ECSE
ENGR 1200[1] Engr Graphics & CAD
MATH 1010 Calculus 1
CSCI 1100 Computer Science 1
HASS Elective
Science Elective[2]
CSCI 1200 Data Structures
MATH 1020 Calculus 2
HASS Elective
ECSE 2610 Computer Components & Ops
ENGR 2350 Embedded Control
CSCI 2200 Foundations of Computer Sci
PHYS 1100 Physics 1
HASS Elective
ECSE 2660 Computer Arch, Networks, & Ops
CSCI 2300 Intro to Algorithms
PHYS 1200 Physics 2
MATH 2400 Intro to Differential Equations
ECSE 2010 Electric Circuits
ENGR 2050 Intro to Engineering Design
MATH 2010 Multivariable Calc & Matrix Algebra
HASS Elective
ECSE 2050 Intro to Electronics
ECSE 2410 Signals & Systems
ECSE 2500 Engineering Probability
ECSE 2900 ECSE Enrichment Seminar
Free Elective 1
HASS Elective
Restricted Elective 1[4]
Technical Elective[6]
Computer Engineering Elective[5]
ENGR 4010 Professional Development 3
Free Elective 2
ECSE 4900 Multidisciplinary Capstone
Restricted Elective 2[4]
Free Elective 3
Professional Development 2[5]
HASS Elective
Key
10-14 Core Engineering Credits
28 Science Credits
16 Mathematics Credits
22 Humanities and Social Sciences Credits
26-30 Computer Systems Core Credits
12-16 Computer Systems Elective Credits
12 Free Electives
130 Total Credit Hours
Pre-Requisite
Co-Requisite
Writing Intensive Course
1. ECSE 1010 Introduction to ECSE may be replaced with ENGR 1100. ENGR 1200 EG & Cad may be replaced with ENGR 1400.
2. Choice of BIOL 1010, BIOL 2120, or CHEM 1100.
3. These courses may be taken in either semester.
4. Any 3- or 4-credit-hour course with the designation ECSE 4XXX, ECSE 6XXX, CSCI 4XXX, or CSCI 6XXX.
5. This course will be fulfilled from a list published either in the catalog or at the start of each semester.
6. Any 3- or 4-credit-hour course in engineering, mathematics, or science at the 4000 level or higher.

EE and CSE Dual Major Curriculum Checklist

Fall						Spring		
				First Year				
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	
Fall				**Second Year**		Spring		
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	Intro to Algorithms	4	
Summer				**Third Year**		Spring or Fall		
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	
Fall				**Fourth Year**		Spring		
ENGR-4010	Professional Devel. III[1]	1				Professional Devel. II[1,2]	2	
ECSE-2210	Microelectronics Tech.	3			ECSE-4900	Multidisc. Capstone Design [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 year
3. 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 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 ELECTIVES
ENGR-1600 Materials Science
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 Adv. Manufacturing 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

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

EE and Mechanical Engineering Dual Major Curriculum Checklist

**Please note using a template form a different class year other than your own may result in graduation delays. Please discuss all templates with your advisors in each department.

Fall						Spring		
				First Year				
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	
Fall				**Second Year**		Spring		
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	
Summer				**Third Year**		Fall or Spring		
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			MANE	Mechanical Eng. Core Mod.	6	
MANE	Mechanical Eng. Core Mod	6			ECSE-2110	Electrical Energy Systems	4	
						Professional Devel. II[1]	2	
Fall				**Fourth Year**		Spring		
ENGR-4010	Professional Devel. III[1]	1			ECSE-2900	ECSE Enrichment Seminar	1	
ENGR-1600	Materials Science	4				Design Elective[1]	3	
	ECSE Lab Elective[1]	3-4				ECSE Restricted Elective[1]	3	
	MANE Technical Elective I	3				MANE Technical Elective II	3	
	ECSE Restricted Elective[1]	3				Hum., Arts or Soc. Sci. El.	4	
	Hum., Arts or Soc. Sci. El.	4				Hum., Arts or Soc. Sci. El.	4	

[1] May be taken either term.

141 credits minimum

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

MANE TECHNICAL ELECTIVE I
MANE-4xxx or MANE-6xxx

MANE TECHNICAL ELECTIVE II
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. Design Lab

ECSE LAB ELECTIVES
ENGR-4710 Adv. Manufacturing 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 ECSE Design (F, S)
MANE-4260 Design of Mech. Sys (F,S)

CSE and Computer Science Dual Major Curriculum Checklist

**Please note using a template form a different class year other than your own may result in graduation delays. Please discuss all templates with your advisors in each department.

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

[1] May be taken either term.
[2] May be taken in the third year.
[3] May be replaced with ENGR-1100 Introduction to Engineering Analysis.
[4] This course is offered exclusively in the fall semester.

***CSE must be your first named major. Otherwise an additional 2 credit hours of H&SS are required.**
129 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 or two categories below (note that the P/NC option cannot be used for any of the courses below):

1. The research-focused capstone consists of a 4-credit Undergraduate Research Project (URP) supervised by a CSCI (or CSCI-affiliated) faculty member. Students must register for these credits (i.e. CSCI 4941) in one of their final two undergrad semesters (not including co-op). Further, the student is required to have taken a 4000 level course or an earlier 4000 level URP with the faculty supervisor. The student will complete a formal written research project report or paper approved by the faculty supervisor. For the URP, the student must either (a) complete a formal written research project report or paper or (b) write and present a conference-quality presentation / poster approved by the faculty supervisor. If students meet the above requirements, they are also encouraged to consider participating in the Honors Research Thesis Program for Undergraduates. Students must include the following information in their URP proposal: (a) Description of the research project, (b) Relevance & significance of the research, (c) Milestones & timeline of the research, with contingency plans if milestones are not met, (d) Description of the project deliverables (i.e., a written document, program developed, etc.)

2. The coursework concentration capstone consists of three 4000 or 6000 level CSCI (or CSCI cross listed) courses in one of the following topic areas: (a) Theory & Algorithms, (b) Systems & Software, (c) Artificial Intelligence & Data, (d) Vision, Graphics, Robotics & 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. Similarly, all 4000 and 6000 level special topics courses (i.e., with 496x, 497x, 696x, 697x course numbers) are assigned to one or more topic areas when the given course is listed. Note that the courses taken also count as Computer Science (CS) Option courses.