Electrical Engineering Curriculum Checklist
Class of 2023 (REVISED)

First Year							
ECSE-1010	Intro. to ECSE [6]	4			ENGR-2350	Embedded Control	4
MATH-1010	Calculus I	4			MATH-1020	Calculus II	4
CSCI-1100	Computer Science I	4			PHYS-1100	Physics I	4
	Hum., Arts or Soc. Sci. Elective	4				Science Elective	4
					ENGR-1200 OR ENGR-1400	Eng. Graphics & CAD [1] OR Eng. Communications [1]	1
Second Year							
ECSE-2610	Computer Comp. & Operations	4			ECSE-2010	Electric Circuits [8]	4
PHYS-1200	Physics II	4			ECSE-2500	Engineering Probability [8]	3
MATH-2400	Intro. to Differential Eqns.	4			MATH-2010	Multivariable Calc & Matrix Algebra	4
	Hum., Arts or Soc. Sci. El.	4				Hum., Arts or Soc. Sci. El.	4
ARCH SEMESTER		**Third Year**				**Fall or Spring**	
ECSE-2110	Electrical Energy Systems	3			ECSE-2050	Intro. to Electronics [8]	4
ENGR-2050	Intro. to Eng. Design	4			ECSE-2100	Fields & Waves I [8]	4
STSS-4100	Professional Development II [1,3]	2			ECSE-2410	Signals & Systems [8]	3
	Hum., Arts or Soc. Sci. El.	4			ECSE-2900	ECSE Enrichment Seminar	1
	Free Elective [2]	3-4				Math/Science Elective[7]	4
Fourth Year							
ECSE-4900	Multidisc. Capstone Design [1]	3				Restricted Elective [1,4,5]	3
ENGR-4010	Professional Development III [1]	1				Free Elective [1,2]	3-4
ECSE-2210	Microelectronics Tech. [8]	3				Free Elective [1,2]	3-4
	Lab Elective [1,4]	3				Free Elective (if needed)[2]	3-4
	Restricted Elective [1,4,5]	3				Hum., Arts or Soc. Sci. Elective	4
	Technical Elective [1,4,5]	3-4					

1 May be taken either term.
2 The free electives must total to at least 12 credits.
3 For a list of courses that satisfy the Professional Development – Technical Issues & Solution requirement refer to the link "Professional Development Courses" on the Registrar's "Academic Planning" web page. It should be completed before the capstone design course.
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 when satisfying the combined Technical and Restricted Elective requirements.
6 May be replaced with ENGR-1100 Introduction to Engineering Analysis.
7 Students who wish to take ENGR-1600 Materials Science as their Math/Science Elective must take CHEM-1100.
8 Offered in Fall and Spring terms annually. Students should take the courses once the prerequisites are met.

128 credits minimum

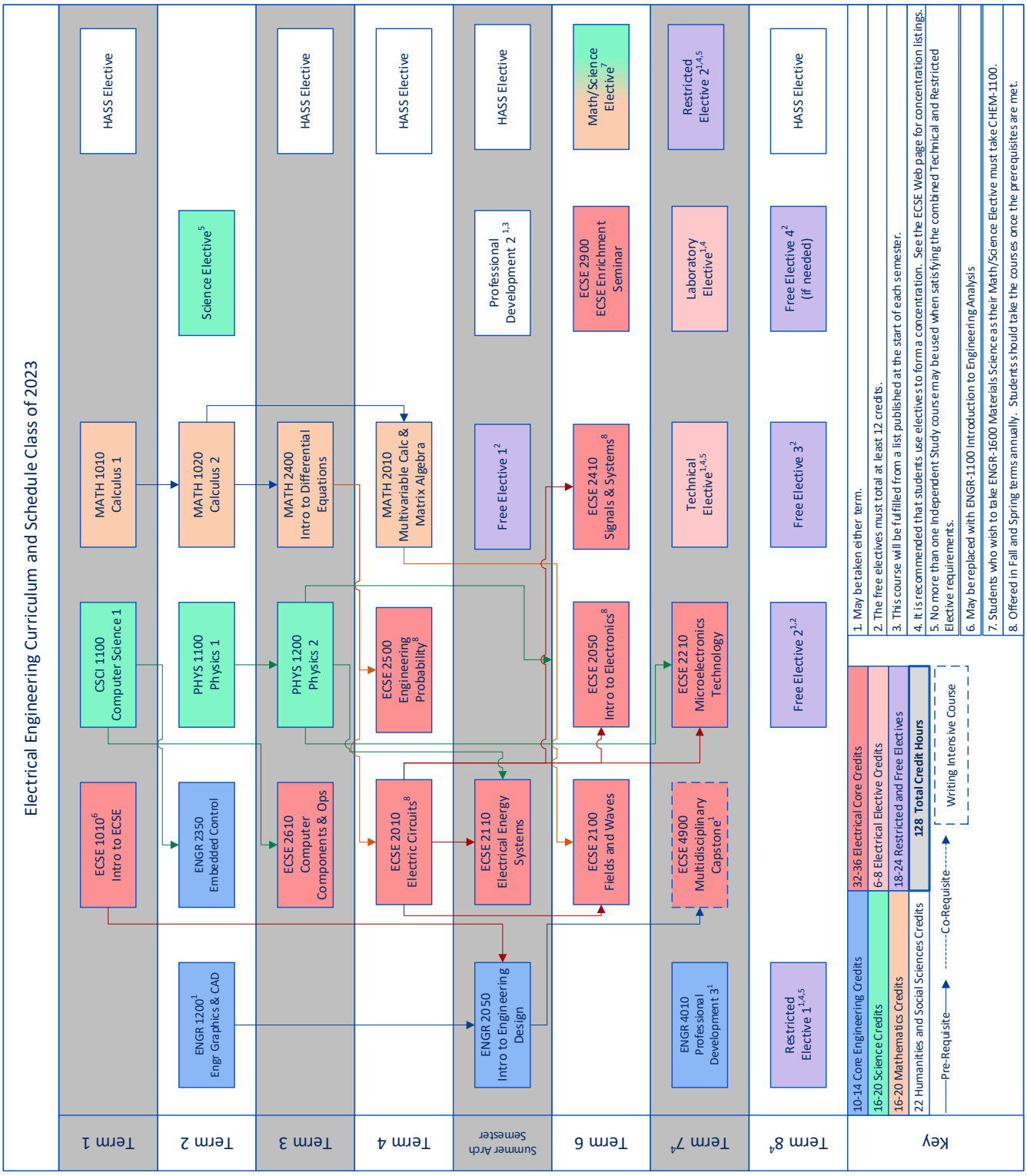
RESTRICTED ELECTIVE
Any 3 or 4 credit hour course with the designation ECSE-4xxx or ECSE-6xxx.

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

LAB ELECTIVES
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
ENGR-4710 Manufacturing Proc & Sys Lab I

SCIENCE ELECTIVE
CHEM-1100 Chemistry I
BIOL-1010/1015 Introduction to Biology + Lab
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 2023
Term 1
Term 2
Term 3
Term 4
Summer Arch Semester
Term 6
Term 7[4]
Term 8[4]
HASS Elective
MATH 1010 Calculus 1
CSCI 1100 Computer Science 1
ECSE 1010[6] Intro to ECSE
MATH 1020 Calculus 2
Science Elective[5]
PHYS 1100 Physics 1
ENGR 2350 Embedded Control
ENGR 1200[1] Engr Graphics & CAD
MATH 2400 Intro to Differential Equations
PHYS 1200 Physics 2
ECSE 2610 Computer Components & Ops
MATH 2010 Multivariable Calc & Matrix Algebra
ECSE 2500 Engineering Probability[8]
ECSE 2010 Electric Circuits[8]
Free Elective 1[2]
Professional Development 2[1,3]
ECSE 2110 Electrical Energy Systems
ENGR 2050 Intro to Engineering Design
ECSE 2410 Signals & Systems[8]
ECSE 2900 ECSE Enrichment Seminar
ECSE 2050 Intro to Electronics[8]
ECSE 2100 Fields and Waves
Technical Elective[1,4,5]
Laboratory Elective[1,4]
ECSE 2210 Microelectronics Technology
ECSE 4900 Multidisciplinary Capstone[1]
ENGR 4010 Professional Development 3[1]
Free Elective 2[1,2]
Free Elective 4[2] (if needed)
Free Elective 3[2]
Restricted Elective 1[1,4,5]
Restricted Elective 2[1,4,5]
Math/Science Elective[7]
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
6-8 Electrical Elective Credits
18-24 Restricted and Free Electives
128 Total Credit Hours
Pre-Requisite
Co-Requisite
Writing Intensive Course
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. 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 when satisfying the combined Technical and Restricted Elective requirements.
6. May be replaced with ENGR-1100 Introduction to Engineering Analysis
7. Students who wish to take ENGR-1600 Materials Science as their Math/Science Elective must take CHEM-1100.
8. Offered in Fall and Spring terms annually. Students should take the courses once the prerequisites are met.

Computer and Systems Engineering Curriculum Checklist
Class of 2023 (REVISED)

First Year							
ECSE-1010	Intro. to ECSE[7]	4			ECSE-2610	Computer Comp. & Operations	4
CSCI-1100	Computer Science I	4			CSCI-1200	Data Structures	4
MATH-1010	Calculus I	4			MATH-1020	Calculus II	4
ENGR-1200 OR ENGR-1400	Eng. Graphics & CAD[1] OR Eng. Communications[1]	1			PHYS-1100	Physics I	4
	Hum., Arts or Soc. Sci. Elective	4					
Second Year							
ENGR-2350	Embedded Control	4			ECSE-2010	Electric Circuits [8]	4
CSCI-2200	Foundations of Comp. Sci.	4			CSCI-2300	Intro to Algorithms	4
MATH-2400	Intro. to Differential Equations	4				Science Elective	4
PHYS-1200	Physics II	4				Hum., Arts or Soc. Sci. Elective	4
Arch Semester		**Third Year**			**Fall or Spring**		
ECSE-2660	Cptr Arch, Nets, & Op Sys	4			ECSE-2050	Intro. to Electronics [8]	4
ENGR-2050	Intro. to Eng. Design	4			ECSE-2410	Signals & Systems [8]	3
MATH-2010	Multivar Calc & Matrix Alg.	4			ECSE-2500	Engineering Probability [8]	3
	Hum., Arts or Soc. Sci. Elective	4			ECSE-2900	Enrichment Seminar	1
					STSS-4100	Professional Development II[1,3,4]	2
						Hum., Arts or Soc. Sci. Elective	4
Fourth Year							
ENGR-4010	Professional Development III[1]	1			ECSE-4900	Multidisc. Capstone Design[1]	3
	Computer Eng Elective[1,4]	3-4				Free Elective[2]	3-4
	Restricted Elective[1,5,6]	3-4				Free Elective[2]	3-4
	Restricted Elective[1,5,6]	3-4				Free Elective (if needed) [2]	3-4
	Technical Elective[1,5,6]	3-4				Hum., Arts or Soc. Sci. Elective	4
	Free Elective[2]	3-4					

1 May be taken either term.
2 The free electives must total at least 12 credits.
3 For a list of courses that satisfy the Professional Development – Technical Issues & Solution requirement refer to the link "Professional Development Courses" on the Registrar's "Academic Planning" web page. It should be completed before the capstone design course.
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.
8 Offered in Fall and Spring terms annually. Students should take the courses once the prerequisites are met.

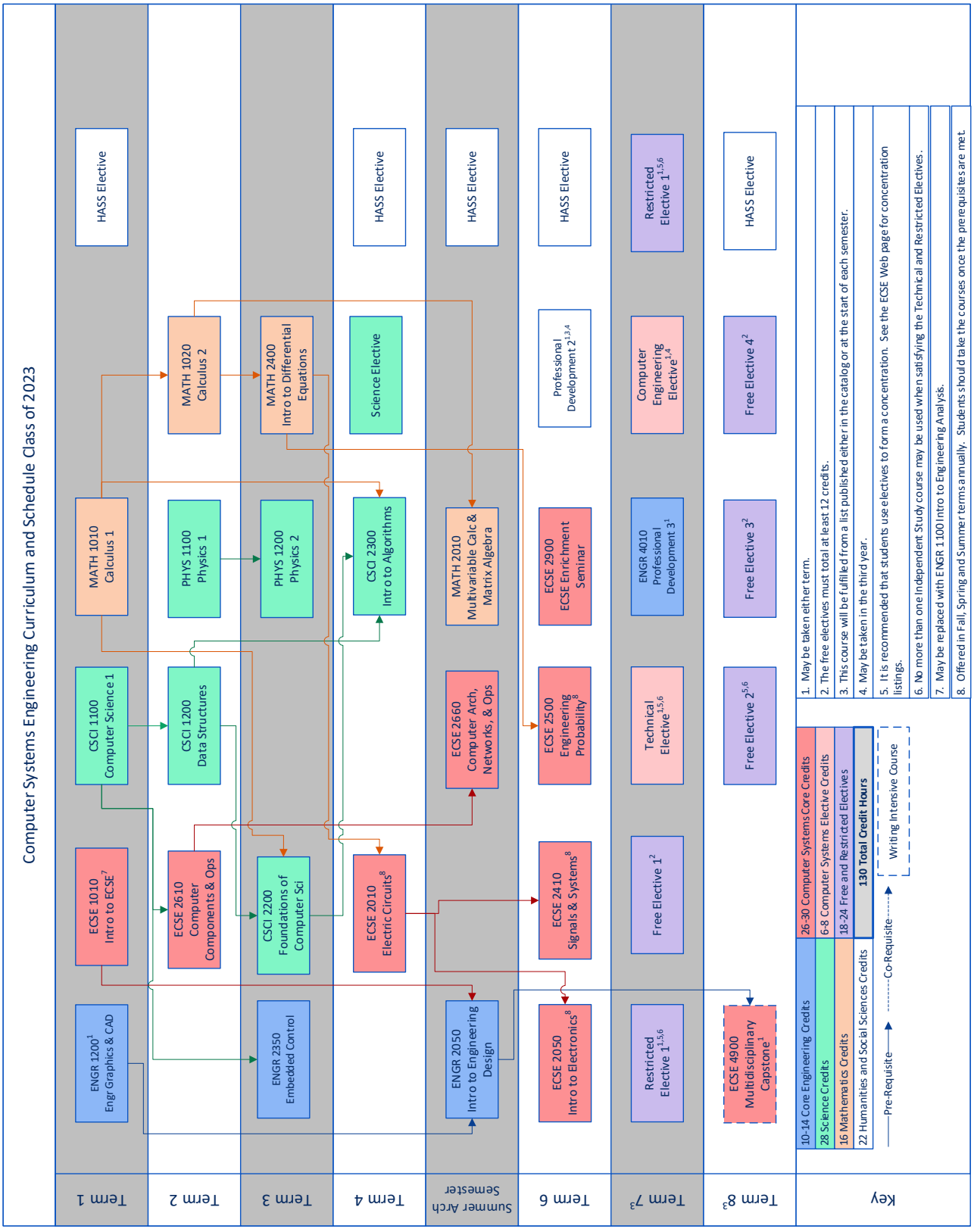
130 credits minimum

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

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

SCIENCE ELECTIVE
BIOL-1010/1015 Introduction to Biology +Lab
BIOL-2120 Intro to Cell and Molecular Biology
CHEM-1100 Chemistry I


Computer Systems Engineering Curriculum and Schedule Class of 2023
Term 1
Term 2
Term 3
Term 4
Summer Arch Semester
Term 6
Term 7[3]
Term 8[3]
ENGR 1200[1] Engr Graphics & CAD
ECSE 1010 Intro to ECSE[7]
CSCI 1100 Computer Science 1
MATH 1010 Calculus 1
HASS Elective
ECSE 2610 Computer Components & Ops
CSCI 1200 Data Structures
PHYS 1100 Physics 1
MATH 1020 Calculus 2
ENGR 2350 Embedded Control
CSCI 2200 Foundations of Computer Sci
PHYS 1200 Physics 2
MATH 2400 Intro to Differential Equations
ECSE 2010 Electric Circuits[8]
CSCI 2300 Intro to Algorithms
Science Elective
HASS Elective
ENGR 2050 Intro to Engineering Design
ECSE 2660 Computer Arch, Networks, & Ops
MATH 2010 Multivariable Calc & Matrix Algebra
HASS Elective
ECSE 2050 Intro to Electronics[8]
ECSE 2410 Signals & Systems[8]
ECSE 2500 Engineering Probability[8]
ECSE 2900 ECSE Enrichment Seminar
Professional Development 2[1,3,4]
HASS Elective
Restricted Elective 1[1,5,6]
Free Elective 1[2]
Technical Elective[1,5,6]
ENGR 4010 Professional Development 3[1]
Computer Engineering Elective[1,4]
Restricted Elective 1[1,5,6]
ECSE 4900 Multidisciplinary Capstone[1]
Free Elective 2[5,6]
Free Elective 3[2]
Free Elective 4[2]
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
6-8 Computer Systems Elective Credits
18-24 Free and Restricted Electives
130 Total Credit Hours
Pre-Requisite
Co-Requisite
Writing Intensive Course
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 either in the catalog or 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 Technical and Restricted Electives.
7. May be replaced with ENGR 1100 Intro to Engineering Analysis.
8. Offered in Fall, Spring and Summer terms annually. Students should take the courses once the prerequisites are met.

Computer and Systems Engineering and Computer Science Dual Major
Class of 2023 (REVISED)

First Year							
ECSE-1010	Intro. to ECSE[3]	4			ECSE-2610	Computer Comp. & Operations	4
CSCI-1100	Computer Science I	4			CSCI-1200	Data Structures	4
ENGR-1200 OR ENGR-1400	Eng. Graphics & CAD[1] OR Eng. Communications[1]	1			MATH-1020	Calculus II	4
MATH-1010	Calculus I	4			PHYS-1100	Physics I	4
	Hum., Arts or Soc. Sci. Elective	4					
Second Year							
ENGR-2350	Embedded Control	4			ECSE-2010	Electric Circuits [4]	4
CSCI-2200	Foundations of Comp. Sci.	4			ECSE-2900	Enrichment Seminar	1
MATH-2400	Intro. to Differential Equations	4			CSCI-2300	Intro to Algorithms	4
PHYS-1200	Physics II	4			MATH-2010	Multivariable Calculus	4
						Hum., Arts or Soc. Sci. Elective	4
Arch Semester		**Third Year**				**Fall or Spring**	
ECSE-2660	Cptr Arch, Nets, & Op Sys	4			ECSE-2050	Intro. to Electronics [4]	4
ENGR-2050	Intro. to Eng. Design	4			ECSE-2410	Signals & Systems [4]	3
CSCI 4210	Operating Systems	4			ECSE-2500	Engineering Probability	3
	Hum., Arts or Soc. Sci. Elective	3-4			CSCI-2600	Principles of Software	4
						Hum., Arts or Soc. Sci. Elective	4
Fourth Year							
ENGR-4010	Professional Development III[1]	1			ECSE-4900	Multidisc. Capstone Design[1]	3
CSCI-4430	Programming Languages[5]	3-4				CSCI Option/Capstone	3-4
	CSCI Option/Capstone	3-4				CSCI Option/Capstone	3-4
	CSCI Option/Capstone	3-4				Hum., Arts or Soc. Sci. Elective	4
BIOL 1010 + 1015	Intro to Biology and Intro to Biology Lab	4			STSS-4100	Professional Development II	2

1 May be taken either term.

2 For a list of courses that satisfy the Professional Development – Technical Issues & Solution requirement refer to the link "Professional Development Courses" on the Registrar's "Academic Planning" web page. It should be completed before the capstone design course.

3 May be replaced with ENGR 1100 Introduction to Engineering Analysis.

4 Offered in Fall and Spring terms annually. Students should take the courses once the prerequisites are met.

5 This course is offered exclusively in the fall semester.

*** CSE must be your first named major. Otherwise, you will need to take an additional HASS course.**

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.

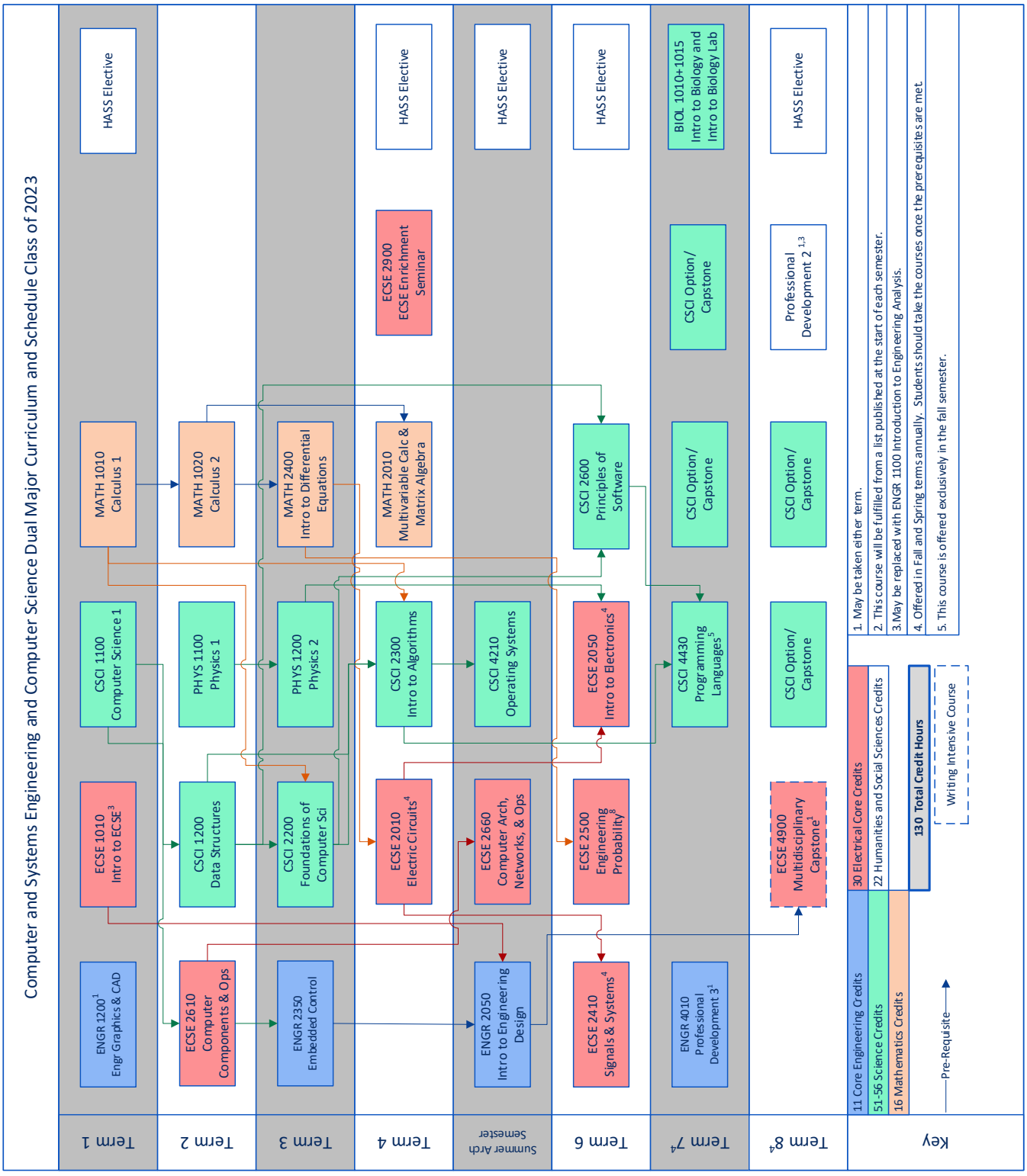
CSCI CAPSTONE

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 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.


Computer and Systems Engineering and Computer Science Dual Major Curriculum and Schedule Class of 2023
Term 1
Term 2
Term 3
Term 4
Summer Arch Semester
Term 6
Term 7[4]
Term 8[4]
HASS Elective
MATH 1010 Calculus 1
CSCI 1100 Computer Science 1
ECSE 1010 Intro to ECSE[3]
ENGR 1200[1] Engr Graphics & CAD
MATH 1020 Calculus 2
PHYS 1100 Physics 1
CSCI 1200 Data Structures
ECSE 2610 Computer Components & Ops
MATH 2400 Intro to Differential Equations
PHYS 1200 Physics 2
CSCI 2200 Foundations of Computer Sci
ENGR 2350 Embedded Control
ECSE 2900 ECSE Enrichment Seminar
MATH 2010 Multivariable Calc & Matrix Algebra
CSCI 2300 Intro to Algorithms
ECSE 2010 Electric Circuits[4]
CSCI 4210 Operating Systems
ECSE 2660 Computer Arch, Networks, & Ops
ENGR 2050 Intro to Engineering Design
CSCI 2600 Principles of Software
ECSE 2050 Intro to Electronics[4]
ECSE 2500 Engineering Probability[5]
ECSE 2410 Signals & Systems[4]
BIOL 1010+1015 Intro to Biology and Intro to Biology Lab
CSCI Option/ Capstone
CSCI 4430 Programming Languages[5]
ENGR 4010 Professional Development 3[1]
Professional Development 2[1,3]
CSCI Option/ Capstone
ECSE 4900 Multidisciplinary Capstone[1]
Key
11 Core Engineering Credits
51-56 Science Credits
16 Mathematics Credits
30 Electrical Core Credits
22 Humanities and Social Sciences Credits
130 Total Credit Hours
Pre-Requisite
Writing Intensive Course
1. May be taken either term.
2. This course will be fulfilled from a list published at the start of each semester.
3. May be replaced with ENGR 1100 Introduction to Engineering Analysis.
4. Offered in Fall and Spring terms annually. Students should take the courses once the prerequisites are met.
5. This course is offered exclusively in the fall semester.