

Electrical Engineering and Computer Science

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Electrical Engineering and Computer Science is an interdepartmental major designed for students who want to integrate work in these two fields. It covers discrete and continuous mathematics, algorithm analysis and design, digital and analog circuits, signals and systems, systems programming, and computer engineering. It provides coherence in its core program, but allows flexibility to pursue technical electives.

PREREQUISITES

The prerequisites for the major are MATH 1120, 1150 (these prerequisites may be waived for students who have taken the equivalent of one year of calculus in high school) and ENAS 1510 or MATH 1200 (or a higher-level course); CPSC 1001 (for students without previous programming experience); and PHYS 1800 and 1810, or PHYS 2000 and 2010. PHYS 1700, 1710 are acceptable for students taking MATH 1120. Acceleration credits may not be used to satisfy prerequisites, and because the B.S. programs in Electrical Engineering and in Engineering Sciences (Electrical) both limit the use of such credits, students who wish to retain the option of switching to these programs should consult the director of undergraduate studies (DUS) in Electrical Engineering when planning their course schedules.

REQUIREMENTS OF THE MAJOR

The major requires fifteen term courses beyond the prerequisites:

CPSC 2010; 2020; 2230; 3230; and either CPSC 3650 or 3660; ECE 2000, ECE 2011, ECE 2020, and ECE 2031; one from MATH 2220, 2250, 2260, S&DS 2380, or S&DS 2410; four advanced electives, two in electrical engineering, two in computer science; and a senior project. MATH 2440 may be substituted for CPSC 2020. Electives must be 3000- or 4000-level courses in the departments of Electrical Engineering or Computer Science or must be approved by the DUSs of both departments. Cross-titled courses may be counted either way to fulfill this requirement. CPSC 2900 and 4900 may not be used as electives. Only one of CPSC 3650 and 3660 may be taken for major credit. With permission of the DUSs of both departments, one of ECE 4680 or ECE 4691 may be used as an electrical engineering elective.

For students who have taken the equivalent of one year of calculus in high school and have some programming experience, a typical program would be:

First-Year	Sophomore	Junior	Senior
ECE 2000	CPSC 2010	CPSC 2020	Senior project
ENAS 1510	ECE 2020	CPSC 3230	One elective
PHYS 1800			
ECE 2011	CPSC 2230	CPSC 3650 or 3660	Two electives
PHYS 1810	ECE 2031	One elective	
	MATH 2220		

Students with no programming experience should take CPSC 1001 in the fall of their first year and either postpone ECE 2000 until their sophomore year or take ENAS 1510 or MATH 1200 in the spring.

For students with one term of calculus and no programming experience, a typical program would be:

First-Year	Sophomore	Junior	Senior
CPSC 1001	CPSC 2010	CPSC 2020	Two electives
MATH 1150	ECE 2000	CPSC 3230	
PHYS 1800	ECE 2020	S&DS 2410	
ECE 2011	CPSC 2230	CPSC 3650 or 3660	Senior project
MATH 1200	ECE 2031	One elective	One elective
PHYS 1810			

For students with no calculus and no programming experience, a typical program would be:

First-Year	Sophomore	Junior	Senior
CPSC 1001	CPSC 2010	CPSC 2020	Two electives
MATH 1120	ECE 2000	CPSC 3230	
PHYS 1700	ENAS 1510	ECE 2020	
ECE 2011	CPSC 2230	CPSC 3650 or 3660	Senior project
MATH 1150	MATH 2220	ECE 2031	One elective
PHYS 1710		One elective	

Students who start with MATH 1120 may satisfy the physics prerequisite by taking PHYS 1700 and 1710 in their first year, as shown in the table above. However, because the B.S. programs in Electrical Engineering and in Engineering Sciences (Electrical) do not allow this substitution, students who wish to retain the option of switching to these programs should postpone physics until their sophomore year.

Credit/D/Fail No course taken Credit/D/Fail may be applied toward the requirements of the major, including prerequisites.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

The senior project must be completed in CPSC 4900 or ECE 4710 and/or ECE 4721, depending on the adviser's department, and must be approved by the DUS in each department.

ADVISING AND APPROVAL OF PROGRAMS

The entire program of a student majoring in Electrical Engineering and Computer Science must be approved by the DUS in each department.

Accreditation Students interested in pursuing an ABET-accredited degree should consider the B.S. program in Electrical Engineering. See Electrical Engineering.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisites MATH 1120, 1150, and ENAS 1510 or MATH 1200; CPSC 1001 (students without previous programming experience); PHYS 1800, 1810, or PHYS 2000, 2010 with exceptions as indicated

Number of courses 15 term courses beyond prerequisites (including senior project)

Specific courses required CPSC 2010, 2020, 2230, 3230, and one of CPSC 3650 or 3660; ECE 2000, ECE 2011, ECE 2020, and ECE 2031; one from MATH 2220, 2250, 2260, S&DS 2380 or 2410

Distribution of courses 4 additional 3000- or 4000-level electives, 2 in electrical engineering, 2 in computer science

Substitution permitted MATH 2440 for CPSC 2020; advanced courses in other depts, with permission of DUS in each department

Senior requirement Independent project (CPSC 4900 or ECE 4710 and/or ECE 4721) approved by DUS in each department