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.

The prerequisites for the major are MATH 112, 115, and ENAS 151 or MATH 120; CPSC 112; and PHYS 180 and 181, or 200 and 201. Acceleration credits may be used to satisfy some of these requirements. However, 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 in Electrical Engineering when planning their course schedules.

The major requires fifteen term courses beyond the prerequisites: CPSC 201, 202, 223, 323, and 365; EENG 200, 201, 202, and 203; one from MATH 222, 225, or STAT 241; four advanced electives, two in electrical engineering, two in computer science; and a senior project. MATH 244 may be substituted for CPSC 202. Electives must be 300- or 400-level courses in the departments of Electrical Engineering (http://catalog.yale.edu/ycps/subjects-of-instruction/electrical-engineering) and Computer Science (http://catalog.yale.edu/ycps/subjects-of-instruction/computer-science), or must be approved by the director of undergraduate studies in each department. Double-titled courses may be counted either way to fulfill this requirement. CPSC 480 and 490 may not be used as electives. With permission of the director of undergraduate studies in each department, EENG 471 or 472 may be used as an electrical engineering elective.

Courses taken Credit/D/Fail may not be counted toward the requirements of the major.

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:

**Freshman**
- EENG 200a
- ENAS 151a
- PHYS 180a
- EENG 201b
- PHYS 181b

**Sophomore**
- CPSC 201a
- EENG 202a
- CPSC 223b
- EENG 203b
- MATH 222b

**Junior**
- CPSC 202a
- CPSC 323a
- CPSC 365b
- One elective
- One elective

**Senior**
- Senior project
- One elective
- Two electives
- One elective
- One elective

Students with no programming experience should take CPSC 112 in the fall of their freshman year and either postpone EENG 200 until their sophomore year or take ENAS 151 or MATH 120 in the spring.

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

**Freshman**
- CPSC 112a
- MATH 115a
- PHYS 180a
- EENG 201b
- MATH 120b
- PHYS 181b

**Sophomore**
- CPSC 201a
- EENG 200a
- EENG 202a
- CPSC 223b
- EENG 203b
- MATH 222b

**Junior**
- CPSC 202a
- CPSC 323a
- STAT 241a
- CPSC 365b
- One elective
- One elective

**Senior**
- Two electives
- Senior project
- One elective
- One elective
- One elective

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

**Freshman**
- CPSC 112a
- MATH 112a
- PHYS 170a
- EENG 201b
- MATH 135b
- PHYS 171b

**Sophomore**
- CPSC 201a
- EENG 200a
- ENAS 151a
- CPSC 223b
- MATH 222b
- One elective

**Junior**
- CPSC 202a
- CPSC 323a
- EENG 202a
- CPSC 365b
- EENG 203b
- One elective

**Senior**
- Two electives
- Senior project
- One elective
- One elective
- One elective

Students who start with MATH 112 may satisfy the physics prerequisite by taking PHYS 170 and 171 in their freshman 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.
Senior requirement  The senior project must be completed in CPSC 490 or EENG 471 or 472, depending on the adviser’s department, and must be approved by the director of undergraduate studies in each department.

Approval of programs  The entire program of a student majoring in Electrical Engineering and Computer Science must be approved by the director of undergraduate studies in each department.

Accreditation  Students interested in pursuing an ABET-accredited degree should consider the B.S. program in Electrical Engineering. See under Electrical Engineering (http://catalog.yale.edu/ycps/subjects-of-instruction/electrical-engineering).

REQUIREMENTS OF THE MAJOR

Prerequisites  MATH 112, 115, and ENAS 151 or MATH 120; CPSC 112; PHYS 180, 181, or 200, 201 (PHYS 170, 171 is acceptable for students who need to take MATH 112)

Number of courses  15 term courses beyond prereqs (incl senior project)

Specific courses required  CPSC 201, 202, 223, 323, and 365; EENG 200, 201, 202, and 203; one from MATH 222 or 225 or STAT 241

Distribution of courses  4 addtl 300- or 400-level electives, 2 in electrical engineering, 2 in comp sci

Substitution permitted  MATH 244 for CPSC 202; advanced courses in other depts, with permission of DUS in each dept

Senior requirement  Independent project (CPSC 490 or EENG 471 or 472) approved by DUS in each dept