

Computer Engineering

Department Information

- **Department Location:**
Electrical and Computer Engineering
- **Department Phone:**
701-231-7019
- **Department Web Site:**
www.ndsu.edu/ece/
- **Credential Offered:**
B.S.Cpr.E.
- **Plan Of Study Sample:**
bulletin.ndsu.edu/programs-study/undergraduate/computer-engineering/#planofstudytext

Major Requirements

Major: Computer Engineering

Degree Type: B.S.Cpr.E.

Minimum Degree Credits to Graduate: 128

University Degree Requirements

1. Satisfactory completion of all requirements of the curriculum in which one is enrolled.
2. Earn a minimum total of 120 credits in approved coursework. Some academic programs exceed this minimum.
3. Satisfactory completion of the general education requirements as specified by the university.
4. A minimum institutional GPA of 2.00 based on work taken at NDSU.
5. At least 36 credits presented for graduation must be in courses number 300 or higher.
6. Transfer Students: Must earn a minimum of 60 credits from a baccalaureate-degree granting or professional institution.
 - a. Of these 60, at least 36 must be NDSU residence credits as defined in #7.
 - b. Within the 36 resident credits, a minimum of 15 must be in courses numbered 300 or higher and 15 credits in the major field of study.
7. At least 36 credits must be NDSU resident credits. Residence credits include credits registered and paid for at NDSU.

For complete information, please refer to the Degree and Graduation Requirements (<http://bulletin.ndsu.edu/past-bulletin-archive/2019-20/academic-policies/undergraduate-policies/degree-and-graduation>) section of this Bulletin.

University General Education Requirements

| Code | Title | Credits |
|--|---------------------------------|-----------|
| Communication (C) | | 12 |
| ENGL 110 | College Composition I | |
| ENGL 120 | College Composition II | |
| COMM 110 | Fundamentals of Public Speaking | |
| Upper Division Writing [†] | | |
| Quantitative Reasoning (R) [†] | | 3 |
| Science and Technology (S) [†] | | 10 |
| Humanities and Fine Arts (A) [†] | | 6 |
| Social and Behavioral Sciences (B) [†] | | 6 |
| Wellness (W) [†] | | 2 |
| Cultural Diversity (D) ^{*†} | | |
| Global Perspectives (G) ^{*†} | | |
| Total Credits | | 39 |

* May be satisfied by completing courses in another General Education category.

† General education courses may be used to satisfy requirements for both general education and the major, minor, and program emphases, where applicable. Students should carefully review major requirements to determine if specific courses can also satisfy these general education categories.

- A list of university approved general education courses and administrative policies are available here (<http://bulletin.ndsu.edu/past-bulletin-archive/2019-20/academic-policies/undergraduate-policies/general-education/#genedcoursestext>).

Major Requirements

| Code | Title | Credits |
|--|--|----------|
| Computer Engineering Core Requirements | | |
| ECE 111 | Introduction to Electrical and Computer Engineering | 3 |
| ECE 173 | Introduction to Computing * | 4 |
| ECE 275 | Digital Design * | 4 |
| ECE 320 | Electronics for Computer Engineers | 3 |
| ECE 341 | Random Processes | 3 |
| ECE 343 | Signals & Systems | 4 |
| ECE 374 | Computer Organization | 4 |
| ECE 376 | Embedded Systems | 4 |
| ECE 401 | Design I (capstone) | 1 |
| ECE 403 | Design II (capstone) | 2 |
| ECE 405 | Design III (capstone) | 3 |
| ECE 474 | Computer Architecture | 3 |
| ECE 475 | Advanced Digital Design | 4 |
| Math Courses Required | | |
| MATH 129 | Basic Linear Algebra * | 3 |
| MATH 165 | Calculus I (May satisfy general education category R) | 4 |
| MATH 166 | Calculus II * | 4 |
| MATH 265 | Calculus III (w/ vectors) * | 4 |
| MATH 266 | Introduction to Differential Equations * | 3 |
| CSCI Courses Required | | |
| CSCI 161 | Computer Science II (May satisfy general education category S for Computer Engineering majors only)) | 4 |
| CSCI 222 | Discrete Mathematics | 3 |
| CSCI 413 | Principles of Software Engineering | 3 |
| CSCI 459 | Foundations of Computer Networks | 3 |
| CSCI 474 | Operating Systems Concepts | 3 |
| Other Courses Required | | |
| CHEM 121 | General Chemistry I (May satisfy general education category S) | 3 |
| CHEM 121L or PHYS 251L | General Chemistry I Laboratory (May satisfy general education category S) University Physics I Laboratory | 1 |
| EE 206 | Circuit Analysis I * | 4 |
| Select one of the following: (May satisfy general education category C) | | 3 |
| ENGL 320 | Business and Professional Writing | |
| ENGL 321 | Writing in the Technical Professions | |
| ENGL 324 | Writing in the Sciences | |
| ENGL 459 | Researching and Writing Grants and Proposal | |
| ENGR 402 | Engineering Ethics and Social Responsibility | 1 |
| PHYS 251 | University Physics I (May satisfy general education category S) | 4 |
| ECE Electives | Select 6 cr. of ECE 400 level electives (excluding 494 and 496); may include CSCI 467 | 6 |
| Includes the cross listed courses of ECE/IME 427; ECE/IME 429; ECE/PHYS 411; & ECE/PHYS 411L | | |
| Tech Electives: Select 6 credits from the following: | | 6 |
| CSCI 336 | Theoretical Computer Science | |
| CSCI 366 | Database Systems | |
| CSCI 372 | Comparative Programming Languages | |
| CSCI 4XX | Any CSCI 400 level didactic course | |
| ECE 311 | Circuit Analysis II | |
| ECE 321 | Electronics for Electrical Engineers [†] | |
| ECE 351 | Applied Electromagnetics | |

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|---------------|---|
| ECE 4XX | Any ECE 400 level didactic course |
| ECE 494 | |
| ECE 496 | (max. of 3 cr.) |
| ENGR 310 | Entrepreneurship for Engineers and Scientists |
| IME 440 | Engineering Economy |
| IME 456 | Program and Project Management |
| IME 460 | Evaluation of Engineering Data |
| IME 470 | Operations Research I |
| PHYS 252 | University Physics II |
| Total Credits | |
| 100 | |

* No grade less than a C accepted in these courses.

Degree Requirements and Notes

- A student must complete at least 60 semester credits of professional level course work in his/her program while in residence and enrolled in the college. Students transferring into the college from programs with professional accreditation are exempt from this residency requirement but are subject to the residency requirement of NDSU.
- Transfer Students – Transfer courses with grades less than 'C' in Biology, Chemistry, Computer Science, Mathematics, Physics, and any type of engineering class will not be accepted as a major requirement.
- In order to graduate, an ECE student must have at least a 2.0 GPA in all required EE and ECE courses taken at NDSU. Elective ECE courses are not included in this GPA requirement.
- All Students – Students are required to attain a grade of 'C' or better in ECE 173 Introduction to Computing, ECE 275 Digital Design, EE 206 Circuit Analysis I, and all required MATH courses.