

# Computer Engineering

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## Department Information

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

## Major Requirements

### Major: Computer Engineering

Degree Type: B.S.Cpr.E.

Required 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 specific 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/2018-19/academic-policies/undergraduate-policies/degree-and-graduation>) section of this Bulletin.

### University General Education Requirements

Code	Title	Credits
<b>Communication (C)</b>		12
ENGL 110	College Composition I	
ENGL 120	College Composition II	
COMM 110	Fundamentals of Public Speaking	
Upper Division Writing <sup>†</sup>		
<b>Quantitative Reasoning (R) <sup>†</sup></b>		3
<b>Science and Technology (S) <sup>†</sup></b>		10
<b>Humanities and Fine Arts (A) <sup>†</sup></b>		6
<b>Social and Behavioral Sciences (B) <sup>†</sup></b>		6
<b>Wellness (W) <sup>†</sup></b>		2
<b>Cultural Diversity (D) <sup>*†</sup></b>		
<b>Global Perspectives (G) <sup>*†</sup></b>		
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/2018-19/academic-policies/undergraduate-policies/general-education/#genedcoursestext>).

## Major Requirements

Code	Title	Credits
<b>Computer Engineering Core Requirements</b>		
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
<b>Math Courses Required</b>		
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
<b>CSCI Courses Required</b>		
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
<b>Other Courses Required</b>		
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
<b>ECE Electives</b>	<b>Select 6 cr. of ECE 400 level electives (excluding 494 and 496); may include CSCI 467</b>	<b>6</b>
Includes the cross listed courses of ECE/IME 427; ECE/IME 429; ECE/PHYS 411; & ECE/PHYS 411L		
<b>Tech Electives: Select 6 credits from the following:</b>		<b>6</b>
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	

ECE 4XX	Any ECE 400 level didactic course
ECE 494	Individual Study
ECE 496	Field Experience (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.