Electrical Engineering & Physics

Department Information

- **Department Web Site:**
  www.ndsu.edu/ece/ (http://www.ndsu.edu/ece/)
- **Credential Offered:**
  B.S.E.E.
- **Sample Program Guide:**
  catalog.ndsu.edu/programs-study/undergraduate/electrical-engineering-physics/#planofstudytext (http://catalog.ndsu.edu/programs-study/undergraduate/electrical-engineering-physics/#planofstudytext)

Major Requirements

Double Major: Electrical Engineering & Physics

Degree Type: B.S.E.E.
Minimum Degree Credits to Graduate: 135

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 30 credits must be NDSU resident credits. Resident credits include credits registered and paid for at NDSU.
6. At least 36 credits presented for graduation must be in courses numbered 300 or higher.
7. Students presenting transfer credit must meet the NDSU residence credits and the minimum upper level credit. Of the 30 credits earned in residence, a minimum of 15 semester credits must be in courses numbered 300 or above, and 15 semester credits must be in the student's curricula for their declared major.

For complete information, please refer to the Degree and Graduation Requirements (http://catalog.ndsu.edu/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**

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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://catalog.ndsu.edu/academic-policies/undergraduate-policies/general-education/#genedcoursestext).

Major Requirements

Code	Title	Credits
Electrical Engineering Core Requirements [1]		
ECE 111	Introduction to Electrical and Computer Engineering	3
ECE 173	Introduction to Computing [2]	4
ECE 275	Digital Design [2]	4
ECE 311	Circuit Analysis II	4
ECE 320	Electronics I	3
ECE 321	Electronics II	2
ECE 331	Energy Conversion	4
ECE 341	Random Processes	3
ECE 343	Signals & Systems	4
ECE 351	Applied Electromagnetics	4
ECE 376	Embedded Systems	4
ECE 401	Design I	1
ECE 403	Design II	2
ECE 405	Design III	3
ECE Electives		
Select 6 credits of ECE 4XX level prefix electives (excluding 494 & 496).		6
Physics Core Requirements		
PHYS 171	Introductory Projects in Physics [2]	1
PHYS 251	University Physics I [2]	4
PHYS 251L	University Physics I Laboratory [2]	1
PHYS 252	University Physics II [2]	4
PHYS 252L	University Physics II Laboratory [2]	1
PHYS 350	Modern Physics [2]	3
PHYS 355	Classical Mechanics [2]	3
PHYS 360	Modern Physics II [2]	3
PHYS 370	Introduction to Computational Physics [2]	3
PHYS 462	Thermal and Statistical Physics [2]	3
PHYS 485	Quantum Mechanics I [2]	3
Select one from the following: [2]		3-4
PHYS 411 & 411L	Optics for Scientists & Engineers and Optics for Scientists and Engineers Lab (or ECE 411 & ECE 411L))	
PHYS 413	Lasers for Scientists and Engineers	
PHYS 415	Elements of Photonics	
Physics Electives: Select one from the following [2]		3
PHYS 215	Research For Undergraduates (2 credit minimum)	
PHYS 481	Materials Physics	
PHYS 486	Quantum Mechanics II	
PHYS 489	Senior Project II	
MSUM Astronomy Courses (AST 300-400 level - with dept. permission)		
Mathematics Courses Required		
MATH 129	Basic Linear Algebra [2]	3
MATH 165	Calculus I [2]	4
MATH 166	Calculus II [2]	4
MATH 265	Calculus III [2]	4
MATH 266	Introduction to Differential Equations [2]	3
Other Required Courses		
EE 206	Circuit Analysis I [2]	4

ENGR 327	Ethics, Engineering, and Technology	3
Select one upper division writing course from the following:		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	
Total Credits		**114-115**

[1]

Students must complete all of the courses listed in the Electrical Engineering Core Requirements section with a 2.00 GPA.

[2]

No grade less than a 'C' is accepted in these course and before enrolling in ECE 3XX level prefix courses, excluding ECE 311.