

PHYSICS, B.S.

Degree Requirements (120 hours)

Program of Study

Requirements	Credit Hours
1. Carolina Core	33-45
2. College Requirements	16-19
3. Program Requirements	24-39
4. Major Requirements	32-54

Founding Documents Requirement

All undergraduate students must take a 3-credit course or its equivalent with a passing grade in the subject areas of History, Political Science, or African American Studies that covers the founding documents including the United State Constitution, the Declaration of Independence, the Emancipation Proclamation and one or more documents that are foundational to the African American Freedom struggle, and a minimum of five essays from the Federalist papers. This course may count as a requirement in any part of the program of study including the Carolina Core, the major, minor or cognate, or as a general elective. Courses that meet this requirement are listed here (<https://academicbulletins.sc.edu/undergraduate/founding-document-courses/>).

1. Carolina Core Requirements (33-45 hours)

Effective, Engaged, and Persuasive Communication: Written – CMW (6 hours)

must be passed with a grade of C or higher

- any CC-CMW courses (<https://academicbulletins.sc.edu/undergraduate/carolina-core-courses/>)

ARP – Analytical Reasoning and Problem Solving (8 hours)

must be passed with a grade of C or higher

- MATH 141
- MATH 142

SCI – Scientific Literacy (7 hours)

must be passed with a grade of C or higher

- CHEM 111 & CHEM 111L
- PHYS 211

GFL – Global Citizenship and Multicultural Understanding: Foreign Language (0-6 hours)

Demonstration of proficiency in one foreign language equivalent to the minimal passing grade on the exit examination in the 122 course is required. Students can demonstrate this proficiency by successfully completing Phase II of the Proficiency Test or by successfully completing the 122 course, including the exit exam administered as part of that course.

- CC-GFL courses (<https://academicbulletins.sc.edu/undergraduate/carolina-core-courses/>)

It is strongly recommended that students continuing the study of a foreign language begin college-level study of that language in their first semester and continue in that language until their particular foreign language requirement is completed.

GHS – Global Citizenship and Multicultural Understanding: Historical Thinking (3 hours)

- any CC-GHS course (<https://academicbulletins.sc.edu/undergraduate/carolina-core-courses/>)

GSS – Global Citizenship and Multicultural Understanding: Social Sciences (3 hours)

- any CC-GSS course (<https://academicbulletins.sc.edu/undergraduate/carolina-core-courses/>)

AIU – Aesthetic and Interpretive Understanding (3 hours)

- any CC-AIU course (<https://academicbulletins.sc.edu/undergraduate/carolina-core-courses/>)

CMS – Effective, Engaged, and Persuasive Communication: Spoken Component ¹ (0-3 hours)

- any overlay or stand-alone CC-CMS course (<https://academicbulletins.sc.edu/undergraduate/carolina-core-courses/>)

INF – Information Literacy ¹ (0-3 hours)

- any overlay or stand-alone CC-INF course (<https://academicbulletins.sc.edu/undergraduate/carolina-core-courses/>)

VSR – Values, Ethics, and Social Responsibility ¹ (0-3 hours)

- any overlay or stand-alone CC-VSR course (<https://academicbulletins.sc.edu/undergraduate/carolina-core-courses/>)

¹ **Carolina Core Stand Alone or Overlay Eligible Requirements** – Overlay-approved courses offer students the option of meeting two Carolina Core components in a single course. A maximum of two overlays is allowed. The total Carolina Core credit hours must add up to a minimum of 31 hours. Some programs may have a higher number of minimum Carolina Core hours due to specified requirements.

2. College Requirements (16-19 hours)

Foreign Language (0-3 hours)

- only if needed to meet 122-level proficiency

Analytical Reasoning (7 hours)

must be passed with a grade of C or higher

Course	Title	Credits
CSC 145	Algorithmic Design I	4
STAT 509 or STAT 515	Statistics for Engineers Statistical Methods I	3
Total Credit Hours		7

History (3 hours)

The College of Arts and Sciences requires one U.S. History and one non-U.S. History course. Whichever is not fulfilled through the Carolina Core

GHS requirement must be fulfilled through this college requirement. Accordingly, please select one of the following:

- One Carolina Core GHS-approved course (<https://academicbulletins.sc.edu/undergraduate/carolina-core-courses/>) primarily focused on U.S. History: HIST 111, HIST 112, HIST 214 or another GHS-approved course determined by the College of Arts and Science to fit this geographic category.
- or
- One Carolina Core GHS-approved course primarily focused on non-U.S. History: HIST 101, HIST 102, HIST 104, HIST 105, HIST 106, HIST 108, HIST 109, GERM 280, FAMS 300, or another GHS-approved course determined by the College of Arts and Sciences to fit this geographic category.

Social Science and Fine Arts or Humanities (6 hours)

Courses Acceptable for Social Science and Fine Arts or Humanities Credit in Degree Programs in the College of Arts and Sciences (<https://academicbulletins.sc.edu/undergraduate/arts-sciences/courses-acceptable-social-science-fine-arts-humanities/>)

- **Three** hours of Social Science
- **Three** hours of Fine Arts or Humanities

3. Program Requirements (24-39 hours)

Supporting Courses (24 hours)

must be passed with a grade of C or higher

Course	Title	Credits
CHEM 112 & 112L	General Chemistry II and General Chemistry II Lab	4
PHYS 199	Measurement and Analysis in Physics	2
PHYS 212	Essentials of Physics II	3
PHYS 306	Principles of Physics III	3
MATH 241	Vector Calculus	3
MATH 242 or MATH 520	Elementary Differential Equations or Ordinary Differential Equations	3
Select six hours of the following:		6
MATH 300	Transition to Advanced Mathematics	
MATH 344	Applied Linear Algebra	
MATH 500-level and above (selected with advisor)		
Total Credit Hours		24

Cognate

The required mathematics courses satisfy the cognate requirement.

Electives (0-15 hours)

No courses of a remedial, developmental, skill-acquiring, or vocational nature may apply as credit toward degrees in the College of Arts and Sciences. The College of Arts and Sciences allows the use of the Pass-Fail option on elective courses. Further clarification on inapplicable courses can be obtained from the College of Arts and Sciences.

4. Major Requirements (32-54 hours)

A minimum grade of C is required in all major courses.

Major Courses (32 hours)

Course	Title	Credits
PHYS 307	Introduction to Modern Physics	3
Select one of the following:		4
PHYS 308 & 309	Classic Experiments in Physics I and Classic Experiments in Physics II	
PHYS 310	Intermediate Experimental Physics	
PHYS 501	Quantum Physics I	3
PHYS 502	Quantum Physics II	3
PHYS 503	Mechanics	4
PHYS 504	Electromagnetic Theory	4
PHYS 506	Thermal Physics and Statistical Mechanics	3
PHYS 541	Advanced Experimental Physics I	4
Select one of the following Experimental Physics courses:		4
PHYS 509	Solid State Electronics	
PHYS 510	Digital Electronics	
PHYS 511	Nuclear Physics	
PHYS 512	Solid State Physics	
PHYS 514	Optics, Theory, and Applications	
PHYS 521	Biophysics	
PHYS 542	Advanced Experimental Physics II	
Total Credit Hours		32

Engineering Physics Concentration (52-54 hours) optional

In order to select the Engineering Physics Concentration a student must have achieved a minimum overall GPA of 2.5 with at least 15 hours taken at USC-Columbia. In addition, the student must have passed MATH 141 with a grade of "C" or higher. (An AP or IB exam score that provides credit for MATH 141 also satisfies this requirement.)

Select either the Electrical or Mechanical Option.

Electrical Option (52-53 hours)

Course	Title	Credits
CSC 211	Digital Logic Design	3
ELCT 102	Electrical Science	3
ELCT 201	Introductory Electrical Engineering Laboratory	3
ELCT 221	Circuits	3
ELCT 222	Signals and Systems	3
ELCT 301	Electronics Laboratory	3
ELCT 371	Electronics	3
PHYS 307	Introduction to Modern Physics	3
Select one of the following:		4
PHYS 308 & 309	Classic Experiments in Physics I and Classic Experiments in Physics II	
PHYS 310	Intermediate Experimental Physics	
PHYS 311	Introduction to Applied Numerical Methods	3
PHYS 501	Quantum Physics I	3
PHYS 503	Mechanics	4
PHYS 504	Electromagnetic Theory	4
PHYS 506	Thermal Physics and Statistical Mechanics	3
PHYS 541	Advanced Experimental Physics I	4
Physics Elective		

Select one of the following: 3-4

PHYS 502	Quantum Physics II
PHYS 509	Solid State Electronics
PHYS 511	Nuclear Physics
PHYS 512	Solid State Physics
PHYS 514	Optics, Theory, and Applications
PHYS 521	Biophysics
PHYS 542	Advanced Experimental Physics II

Total Credit Hours 52-53

Mechanical Option (52-54 hours)

Course	Title	Credits
EMCH 200	Statics	3
EMCH 260	Solid Mechanics	3
EMCH 290	Thermodynamics	3
Select four courses (at least 12 hours) from EMCH 300 and above		12
PHYS 307	Introduction to Modern Physics	3
Select one of the following:		4
PHYS 308 & 309	Classic Experiments in Physics I and Classic Experiments in Physics II	
PHYS 310	Intermediate Experimental Physics	
PHYS 311	Introduction to Applied Numerical Methods	3
PHYS 501	Quantum Physics I	3
PHYS 503	Mechanics	4
PHYS 504	Electromagnetic Theory	4
PHYS 541	Advanced Experimental Physics I	4
Select two of the following Physics electives:		6-8
PHYS 502	Quantum Physics II	
PHYS 506	Thermal Physics and Statistical Mechanics	
PHYS 509	Solid State Electronics	
PHYS 511	Nuclear Physics	
PHYS 512	Solid State Physics	
PHYS 514	Optics, Theory, and Applications	
PHYS 521	Biophysics	
PHYS 542	Advanced Experimental Physics II	

Total Credit Hours 52-54