

PHYSICS, BS

REQUIREMENTS

UNIVERSITY REQUIREMENTS

All undergraduate students must complete both the following Core General Education (Core GenEd) and University Degree and Quality of Work requirements. The requirements below apply to students whose first term at UW-Madison or whose earliest post-high school college attendance at any institution is Summer 2026 or later.

Students whose first term at UW-Madison or whose earliest post-high school college attendance at any institution occurred before Summer 2026 should refer to the archived Guide (<https://guide.wisc.edu/archive/>) for the requirements that apply to them.

CORE GENERAL EDUCATION (CORE GENED) REQUIREMENTS

Civics & Perspectives 3 credits of Civics & Perspectives coursework.

Communication & Literacy 6 credits of Communication & Literacy coursework. This requirement may be partially satisfied by a qualifying placement test score. More information: <https://go.wisc.edu/qualifyingenglishplacement> (<https://go.wisc.edu/qualifyingenglishplacement/>)

Humanities & Arts 6 credits of Humanities & Arts coursework.

Mathematics & Quantitative Reasoning 6 credits of Mathematics & Quantitative Reasoning coursework. This requirement may be partially satisfied by a qualifying placement test score. More information: <https://go.wisc.edu/qualifyingmathplacement> (<https://go.wisc.edu/qualifyingmathplacement/>)

Natural Science & Wellness Complete both:

- 6 credits of Natural Science & Wellness or Natural Science & Wellness + Laboratory coursework.
- one course must be in Natural Science & Wellness + Laboratory coursework.

Social & Behavioral Science 3 credits of Social & Behavioral Science coursework.

Total Credits 30 credits.

For more information see the policy (<https://policy.wisc.edu/library/UW-1095/>).

UNIVERSITY DEGREE AND QUALITY OF WORK REQUIREMENTS

All undergraduate degree recipients must complete the following minimum requirements. Requirements for some programs will exceed these requirements; see program requirements for additional information.

Total Degree 120 degree credits.

Residency Complete 30 credits in residence. A course is considered "in residence" if it is taken when in undergraduate degree-seeking status and:

- is offered by UW-Madison and completed on the UW-Madison campus or at an approved off-site location, or
- is offered by UW-Madison in an online or distance format, or is completed during participation in a UW-Madison study abroad/study away program.

Quality of Work Achieve at least the minimum grade point average specified by the school, college, and/or academic program.

Math Demonstrate minimal mathematics competence by:

- placing above MATH 96, or
- successfully completing MATH 96, or
- successfully completing a more advanced mathematics course such as MATH 112, MATH 113, MATH 114, MATH 141, MATH 211, or MATH 221.

English Language If required to take the UW-Madison English as a Second Language Assessment Test (MSN-ESLAT), demonstrate minimal English language competence by:

- earning credit for ESL 118, or
- achieving a qualifying MSN-ESLAT placement test score.

Language Complete one:

- 2 high school units of a single language other than English, or
- one course with the second semester Language designation.

Major Declaration Declare and complete the requirements for at least one major.

COLLEGE OF LETTERS & SCIENCE DEGREE REQUIREMENTS: BACHELOR OF SCIENCE (BS)

Students pursuing a Bachelor of Science degree in the College of Letters & Science must complete all of the requirements below. Some courses satisfy more than one L&S degree requirement (visit College of Letters & Science: Requirements (<https://guide.wisc.edu/undergraduate/letters-science/#requirementstext>) for details).

This major can be paired with either the Bachelor of Arts or the Bachelor of Science degree requirements.

BACHELOR OF SCIENCE DEGREE REQUIREMENTS

Communication Complete both:

- Part A: one course with the Communication A designation or eligible UW Placement Score; and
- Part B: one course with the Communication B designation

Quantitative Reasoning	Complete both: <ul style="list-style-type: none"> Part A: one course with the Quantitative Reasoning A designation or eligible UW Placement Score; and Part B: one course with the Quantitative Reasoning B designation
Ethnic Studies	one 3+ credit course with the Ethnic Studies designation
Language	the third unit of a language other than English
Mathematics	Complete two courses of 3+ credits at the Intermediate or Advanced level in MATH, COMP SCI, or STAT subjects. A maximum of one course in each of COMP SCI and STAT subjects counts toward this requirement.
L&S Breadth: Humanities	Complete 12 credits with the Humanities or Literature designation, which must include at least 6 credits with the Literature designation.
L&S Breadth: Social Sciences	Complete 12 credits with the Social Science designation.
L&S Breadth: Natural Sciences	Complete 12 credits, which must include both: <ul style="list-style-type: none"> 6 credits with the Biological Science designation, and 6 credits with the Physical Science designation.
Liberal Arts and Science (LAS) Coursework	at least 108 credits
Depth of Intermediate/Advanced Coursework	at least 60 credits at the Intermediate or Advanced level
Major	Declare and complete at least one major.
Total Credits	at least 120 credits
UW-Madison Experience	<ul style="list-style-type: none"> 30 credits in residence, overall, and 30 credits in residence after the 86th credit
Quality of Work	<ul style="list-style-type: none"> 2.000 in all coursework at UW-Madison 2.000 in Intermediate/Advanced level coursework at UW-Madison

NON-L&S STUDENTS PURSUING AN L&S MAJOR

Non-L&S students who have permission from their School/College to pursue an additional major within L&S only need to fulfill the major requirements. They do not need to complete the L&S Degree Requirements above.

REQUIREMENTS FOR THE MAJOR

The physics major requires 35 credits from the following:

Code	Title	Credits
Introductory Physics¹		
<i>First Introductory Course (complete one):¹</i>		5
PHYSICS 247	A Modern Introduction to Physics (recommended)	
PHYSICS 207	General Physics	
PHYSICS 201	General Physics	

E M A 201 & E M A 202	Statics and Dynamics ²	
<i>Second Introductory Course (complete one):</i>		5
PHYSICS 248	A Modern Introduction to Physics (recommended)	
PHYSICS 208	General Physics	
PHYSICS 202	General Physics	
<i>Third Introductory Course (complete one):</i>		3-4
PHYSICS 249	A Modern Introduction to Physics (recommended)	
PHYSICS 205	Modern Physics for Engineers (See advising and careers for more information.)	
PHYSICS/ E C E 235	Introduction to Solid State Electronics (See advising and careers for more information.)	
PHYSICS 241	Introduction to Modern Physics	
Intermediate Mechanics		
PHYSICS 311	Mechanics	3
Electromagnetism (complete one):		
PHYSICS 322	Electromagnetic Fields	
E C E 220 & E C E 320 & E C E 420	Electrodynamics I and Electrodynamics II and Electromagnetic Wave Transmission ³	
Quantum Mechanics (complete one):		
PHYSICS 448	Atomic and Quantum Physics	3
PHYSICS 531	Introduction to Quantum Mechanics	
Laboratory		
<i>Full registered credit per course:</i>		
PHYSICS 307	Intermediate Laboratory-Mechanics and Modern Physics	
PHYSICS 407	Advanced Laboratory	
<i>Two credits apply from each of the following:</i>		
PHYSICS 321	Electric Circuits and Electronics ⁴	
PHYSICS 325	Optics ⁴	
PHYSICS 623	Electronic Aids to Measurement ⁴	
PHYSICS 625	Applied Optics ⁴	
ASTRON 465	Observational Astronomy and Data Analysis ⁵	
N E 427	Nuclear Instrumentation Laboratory ⁵	
N E 428	Nuclear Reactor Laboratory ⁵	
<i>One credit applies from each of the following:</i>		
E C E 305	Semiconductor Properties Laboratory ⁵	
E C E 313	Optoelectronics Lab ⁵	
Advanced Physics Electives		
Total Credits		35

¹ PHYSICS 247/PHYSICS 248/PHYSICS 249 is the introductory course sequence recommended for prospective physics majors, PHYSICS 201/PHYSICS 202/PHYSICS 241 is recommended for engineers, and PHYSICS 207/PHYSICS 208/PHYSICS 241 is intended for life sciences and chemistry majors. Both PHYSICS 201 General

Physics/PHYSICS 202 General Physics/PHYSICS 241 Introduction to Modern Physics and PHYSICS 207 General Physics/PHYSICS 208 General Physics/PHYSICS 241 Introduction to Modern Physics are suitable alternatives for physics majors. Although the department recommends following one of these sequences, students are allowed to mix them, with the exception that transfers into the PHYSICS 247/PHYSICS 248/PHYSICS 249 sequence are not permitted.

² Both courses must be taken and together count 5 credits toward the 35 required for the major. These credits can be counted toward the 35 required for the major only if these courses are used to satisfy this requirement.

³ All three of E C E 220 and E C E 320 and E C E 420 must be taken, and together count 3 credits toward the 35 required for the major. These credits can be counted toward the 35 required for the major only if these courses are used to satisfy this requirement.

⁴ All four credits for each course count toward 35-credit total.

⁵ For non-PHYSICS courses, students will receive only the credit applied as lab toward the 35-credit requirement.

ADVANCED PHYSICS ELECTIVE COURSES

Code	Title	Credits
PHYSICS 301	Physics Today (recommended) ⁶	1
PHYSICS 307	Intermediate Laboratory-Mechanics and Modern Physics	2
PHYSICS 311	Mechanics	3
PHYSICS 321	Electric Circuits and Electronics	4
PHYSICS 322	Electromagnetic Fields	3
PHYSICS 323	Electromagnetic Fields	3
PHYSICS 325	Optics	4
PHYSICS 361	Machine Learning in Physics	3
PHYSICS 406	Special Topics in Physics	1-4
PHYSICS 407	Advanced Laboratory	2-4
PHYSICS 415	Thermal Physics	3
PHYSICS 448	Atomic and Quantum Physics	3
PHYSICS 449	Atomic and Quantum Physics	3
PHYSICS 498	Directed Study	1-3
PHYSICS 499	Directed Study	1-3
PHYSICS/B M E/ H ONCOL/ MED PHYS 501	Radiation Physics and Dosimetry	3
PHYSICS/E C E/ N E 525	Introduction to Plasmas	3
PHYSICS/E C E/ N E 527	Plasma Confinement and Heating	3
PHYSICS 531	Introduction to Quantum Mechanics	3
PHYSICS 535	Introduction to Particle Physics	3
PHYSICS 545	Introduction to Atomic Structure	3
PHYSICS 551	Solid State Physics	3
PHYSICS 603	Workshop in College Physics Teaching	1-2
PHYSICS 623	Electronic Aids to Measurement	4
PHYSICS 625	Applied Optics	4
PHYSICS 681	Senior Honors Thesis	3
PHYSICS 682	Senior Honors Thesis	3

PHYSICS/ MED PHYS 688	Radiation Production and Detection	4
PHYSICS 691	Senior Thesis	2-3
PHYSICS 692	Senior Thesis	2-3

⁶ It is recommended that the student's program include the seminar PHYSICS 301 Physics Today.

RESIDENCE AND QUALITY OF WORK

- 2.000 GPA in all PHYSICS and all major courses
- 2.000 on at least 15 credits in Upper Level work, taken in residence⁷
- 15 credits in PHYSICS, taken on campus

⁷ Courses that meet the Core and Laboratory requirements, and Advanced level PHYSICS courses, count as upper-level in the major.

HONORS IN THE MAJOR

Students may declare Honors in the Major in consultation with their major advisor and the Honors Program.

HONORS IN THE MAJOR REQUIREMENTS

To earn Honors in the Major, students must satisfy both the requirements for the major (above) and the following additional requirements:

- Earn a 3.300 University GPA
- Earn a 3.300 GPA in all PHYSICS and all major courses
- 12 credits of Honors PHYSICS courses with grades of B or better, to include:
 - PHYSICS 681 - PHYSICS 682, for a total of 6 credits
 - 3 additional credits of Advanced level PHYSICS for Honors, with a grade of B or better
 - 3 credits at any level in PHYSICS for Honors, with a grade of B or better⁸

⁸ Note that enrolling in PHYSICS 247/PHYSICS 248/PHYSICS 249 provides honors credit towards Honors in the Major (not at the Advanced level, however).