PHYSICS, CERTIFICATE

An understanding of the physical universe informs many disciplines. The study of physics is essential to understanding nature and to advancing technology. A certificate in Physics increases the opportunities for students to become better informed on technological issues at the local, state, national, and international levels.

The certificate is designed to serve students majoring in biological fields, Chemistry, or Mathematics, Engineering, Education and other fields who wish to extend their study of physics beyond what may be required or recommended for their major.

HOW TO GET IN

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To declare a certificate in physics, students must fill out a major/certificate declaration form. An undergraduate physics advisor must sign the form. The form to declare the certificate can be obtained at the Physics departmental office. All undergraduate students are eligible to declare the certificate, except those declared in the following majors:

- Physics,
- Astronomy-Physics, and
- Applied Mathematics, Engineering, and Physics (AMEP)

REQUIREMENTS

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The physics certificate requires 18 credits of Intermediate or Advanced-level undergraduate PHYSICS courses, with the following restrictions:

- At least 9 of the credits must be in residence.
- At most one course from each of the three semesters of an introductory sequence can be counted.
- At most 3 credits of directed study can be counted.
- Only graded courses may be used toward the certificate.
- A minimum grade point average of 2.000 is required in all certificate courses.

Code	Title	Credits
First Introductory Course (complete only one):		**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 [1]	
Second Introductory Course (complete only one):		**5**
PHYSICS 248	A Modern Introduction to Physics (recommended) [2]	
PHYSICS 208	General Physics	
PHYSICS 202	General Physics	
Third Introductory Course (complete only one):		**3-4**
PHYSICS 249	A Modern Introduction to Physics (recommended) [2]	
PHYSICS 205	Modern Physics for Engineers	
PHYSICS/ E C E 235	Introduction to Solid State Electronics	
PHYSICS 241	Introduction to Modern Physics	
Directed Study (optional, maximum 3 credits)		**0-3**
PHYSICS 299	Directed Study	
PHYSICS 499	Directed Study	
PHYSICS 681	Senior Honors Thesis	
PHYSICS 682	Senior Honors Thesis	
PHYSICS 691	Senior Thesis	
PHYSICS 692	Senior Thesis	
Additional Intermediate and Advanced PHYSICS courses		**1-5**
PHYSICS/ MED PHYS 265	Introduction to Medical Physics	
PHYSICS 301	Physics Today	
PHYSICS 307	Intermediate Laboratory-Mechanics and Modern Physics	
PHYSICS 311	Mechanics	
PHYSICS 321	Electric Circuits and Electronics	
PHYSICS 322	Electromagnetic Fields	
PHYSICS 323	Electromagnetic Fields	
PHYSICS 325	Optics	
PHYSICS 361	Machine Learning in Physics	
PHYSICS 371	Acoustics for Musicians	
PHYSICS 406	Special Topics in Physics	
PHYSICS 407	Advanced Laboratory	
PHYSICS 415	Thermal Physics	
PHYSICS 448	Atomic and Quantum Physics	
PHYSICS 449	Atomic and Quantum Physics	
PHYSICS/B M E/ H ONCOL/ MED PHYS 501	Radiation Physics and Dosimetry	
PHYSICS/E C E/ N E 525	Introduction to Plasmas	
PHYSICS/E C E/ N E 527	Plasma Confinement and Heating	
PHYSICS 531	Introduction to Quantum Mechanics	
PHYSICS 535	Introduction to Particle Physics	
PHYSICS 545	Introduction to Atomic Structure	
PHYSICS 551	Solid State Physics	
PHYSICS/B M E/ MED PHYS/ PHMCOL-M/ RADIOL 619	Microscopy of Life	
PHYSICS 623	Electronic Aids to Measurement	
PHYSICS 625	Applied Optics	
PHYSICS/ MED PHYS 688	Radiation Production and Detection	
Total Credits		**18**

[1] A maximum of 5 credits from E M A 201 and E M A 202 count toward the 18 credits required for the certificate.

[2] Students may not transfer into the PHYSICS 247 - PHYSICS 248 - PHYSICS 249 sequence from another introductory sequence.

CERTIFICATE COMPLETION REQUIREMENT

This undergraduate certificate must be completed concurrently with the student's undergraduate degree. Students cannot delay degree completion to complete the certificate.

LEARNING OUTCOMES

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1. Understand basic physical principles.
2. Solve problems proficiently using both quantitative and qualitative applications of these physical principles.
3. Know how to perform quantitative measurements of physical phenomena and understand the statistical significance of observations made in the presence of statistical and systematic uncertainties.
4. Be prepared for graduate study and/or careers in STEM fields.
5. Communicate effectively with scientific peers and the public, both orally and in writing.

ADVISING AND CAREERS

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PHYSICS UNDERGRADUATE ADVISORS

Evan Heintz
Professor Tulika Bose
Professor Deniz Yavuz

Scheduling an Advising Appointment with a Physics Major Advisor

To meet with a Physics major advisor, you may either email physics-advisors@wisc.edu or contact them directly.

Read more at physics.wisc.edu/undergraduate/certificate-in-physics (https://physics.wisc.edu/undergraduate/certificate-in-physics/)

SUCCESSWORKS

SuccessWorks (https://successworks.wisc.edu/) at the College of Letters & Science helps you turn the academic skills learned in your classes into a fulfilling life, guiding you every step of the way to securing jobs, internships, or admission to graduate school.

Through one-on-one career advising, events, and resources, you can explore career options, build valuable internship and research experience, and connect with supportive alumni and employers who open doors of opportunity.

- What you can do with your major (https://successworks.wisc.edu/what-you-can-do-with-your-major/) (Major Skills & Outcomes Sheets)
- Make a career advising appointment (https://successworks.wisc.edu/make-an-appointment/)
- Learn about internships and internship funding (https://successworks.wisc.edu/finding-a-job-or-internship/)
- Try "Jobs, Internships, & How to Get Them," (https://successworks.wisc.edu/canvas/) an interactive guide in Canvas for enrolled UW–Madison students