



Physics

John S. Toll Physics Building
(301) 405-3401

<http://umdphysics.umd.edu/academics/undergraduate.html>

College of Computer, Mathematical, & Natural Sciences

Key Features of a Physics Major

- Explore more than 30 fields of physics
- Learn from a world-renowned faculty working on cutting-edge research
- Enjoy the benefits of a supportive environment, small classes, and an active student association
- Collaborate with peer institutions, government agencies, and private industry, from College Park to the South Pole

Career Options and Salaries with a Physics Major

Physicists explore and identify basic principles and laws governing the motion, energy, structure, and interactions of matter. Some physicists study theoretical areas, such as the nature of time and the origin of the universe; others apply their knowledge of physics to practical areas, such as the development of advanced materials, electronic and optical devices, and medical equipment. Physicists design and perform experiments with sophisticated equipment such as lasers, particle accelerators, electron microscopes, and mass spectrometers. On the basis of their observations and analysis, they attempt to discover and explain laws describing the forces of nature, such as gravity, electromagnetism, and nuclear interactions. Experiments also help physicists find ways to apply physical laws and theories to problems in nuclear energy, electronics, optics, materials, communications, aerospace technology, and medical instrumentation.

Most physicists and astronomers work in research and development. Some conduct basic research with the sole aim of increasing scientific knowledge. Others conduct applied research and development, which builds upon the discoveries made through basic research to develop practical applications of this knowledge, such as new devices, products, and processes. For example, knowledge gained through basic research in solid-state physics led to the development of transistors and, then, integrated circuits used in computers.

Physicists also design research equipment, which often has additional unanticipated uses. For example, lasers are used in surgery, microwave devices function in ovens, and measuring instruments can analyze blood or the chemical content of foods.

As of May 2015, the median annual salary for physicists was \$111,580. For those employed by the Federal Government, the median salary was \$113,310.

Career and salary information taken from *Occupational Outlook Handbook*: <http://www.bls.gov/ooh/>.

Advising

If you are considering a major in Physics, you can easily meet with an advisor to discuss the major and to answer any questions you may have.

- Meet with the general academic advisor for the Physical Sciences Program (you can schedule an appointment by contacting ugrad@physics.umd.edu)
- Room 1120, Physics Building

General questions regarding the CMNS majors may be sent to cmnsque@umd.edu. Please include your name, UID, and major in the email. You can also use fall walk-in advising hours at the CMNS Office of Student Services, Mondays – Fridays, 10:00 a.m. – 12:00 p.m. and 2:00 p.m. – 4:00 p.m in 1300 Symons Hall. Walk-in advising will end mid-October.

Declaring a Physics Major

Physics is not a Limited Enrollment Program (LEP). If you have decided to major in this field, you can declare immediately!

In order to declare the Physics major, you must meet with the general academic advisor for the Physical Sciences Program. See the contact information above. You should then submit the declaration of major paperwork to the College of Computer, Mathematical, and Natural Sciences Student Services Office, 130 Symons Hall. Your request will be approved/processed within one to two weeks of the change in your major.

Gen Ed

Physics Four-Year Plan

First Year:

MATH140 (MA/AR)	4
ENGL101 (AW)	3
Elective	4
PHYS174	1
<u>Humanities (HU)*</u>	<u>3</u>

15 credits

MATH141	4
PHYS 171 (NS)	3
Elective	3
History & Social Science (HS)*	3
<u>Oral Communication (OC)*</u>	<u>3</u>

16 credits

Second Year:

PHYS 272/275 (NL)	5
MATH 241	4
Elective	3
<u>Humanities (HU)*</u>	<u>3</u>

15 credits

PHYS 274	3
PHYS 273	3
PHYS 276	2
Elective	3
<u>History & Social Science (HS)*</u>	<u>3</u>

14 credits

Third Year:

PHYS 165	3
PHYS 371	3
PHYS 373	3
ENGL390 (PW)	3
<u>Schol in Practice (SP)* non-major</u>	<u>3</u>

15 credits

PHYS 401	4
PHYS 404	3
PHYS 375 (SP) major	3
Gen Ed/Electives	3
<u>Elective</u>	<u>2</u>

15 credits

Fourth Year:

PHYS 402	4
PHYS 410	4
PHYS 4xx	3
<u>Elective</u>	<u>4</u>

15 credits

PHYS 411	4
PHYS 405	3
PHYS 4xx	3
<u>Elective</u>	<u>5</u>

15 credits

*All students must complete two Distributive Studies courses that are approved I-Series courses. Students must also complete Understanding Plural Society and Cultural Competence courses that may also fulfill a Distributive Studies category.

CORE

Four-Year Plan

First Year:

MATH140	4
ENGL101	3
Elective	3
CORE #1	3
PHYS174	1
PHYS170	1
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	15 credits

MATH141	4
PHYS 171	3
Elective	1
Elective	4
CORE #2	3
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	15 credits

Second Year:

PHYS 272	3
PHYS 275	2
MATH 241	4
Elective	3
CORE #3	3
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	15 credits

PHYS 273	3
PHYS 276	2
MATH 246	3
Electives	4
CORE #4	3
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	15 credits

Third Year:

PHYS 401	4
PHYS 374	4
MATH 240	4
Core #5	3
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	15 credits

PHYS 402	4
PHYS 375	3
Jr ENGL	3
CORE #6	3
Elective	3
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	16 credits

Fourth Year:

PHYS 410	4
PHYS 405	3
ADV CORE #1	3
Electives	6
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	16 credits

PHYS 411	4
PHYS 404	3
Elective	3
ADV CORE #2	3
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	13 credits

Q & A

Is there help available if I'm struggling in my Physics courses?

Yes. The Physics Department offers assistance through its Slawsky Clinic on a walk-in, first-come, first-served basis. Free tutoring is available for PHYS 121, 122, 141, 142, 161, 262, and 263. For available times, see <http://www.umdphysics.umd.edu/academics/academic-support.html>.

What kind of research opportunities are available to undergraduates?

The Physics Department strongly encourages its majors to participate in faculty projects and research. You should meet with professors to learn more about their research and how you can get involved. Beyond the department, there are also opportunities to conduct research through Maryland's Undergraduate Research Assistants Program (URAP) and the National Science Foundation's Research Experience for Undergraduates (REU).

I like Physics, but I'm not sure I want to major in it. How can I maintain my interest without declaring a major or minor?

Get involved with the Society of Physics Students (SPS). An academic and social group, SPS members come from all over campus, from majors like computer science and math to government and politics. SPS sponsors academic talks and demonstrations, as well as maintaining a test bank. The group also sponsors various recreational activities, such as parties, trips to amusement parks, and white-water rafting. For more information, please see <http://umdphysics.umd.edu/sps.html>.