

Physics

A physics major could be for you if you are interested in the study of physical phenomena in our universe. While closely related to biology and chemistry, physics seeks to explain and describe physical interactions using the concepts of force and energy. Introductory astronomy courses are also available.

The career objectives in physics are broad, including scientific research, teaching, engineering, business, health, and related fields. The study of physics at the undergraduate level can prepare you for a career in a diverse range of fields, but it will be necessary to attain an advanced degree to prepare for some job opportunities.

Skills and Competencies

With a physics major, your analyzation, observation, and research skills will be strengthened. An extensive mathematics background is a requirement in this field, so you should be sure that your math skills are strong, at least up through calculus and differential equations. As a physics major your writing skills—absolutely necessary in any career field today—are developed and fine-tuned by means of lab reports and research assignments. Your reading skills will improve through your analysis, evaluation, and observation of data and/or experiments. Speaking skills will be enhanced through presentations and experimental results from class and undergraduate research. Because of the heavy research/experimental component of many physics courses, you can expect to be working directly with groups of people and perhaps directing projects. Remember, the more advanced the course is, the heavier the concentration will be upon you designing some of your own projects, developing/analyzing ideas, and solving problems. Strong computer skills are needed in most science-related jobs today, so be sure that you are familiar and comfortable with working on a computer.

Course Work

This degree includes the following courses as part of the program requirements, and specific major requirements along with general education courses and graduation requirements.

Core

- PH220 Introductory Physics I (5 cr.)
- PH221 Introductory Physics II (5 cr.)
- PH322 Modern Physics (4 cr.)
- PH380 Interm. Electricity and Magnetism (3 cr.)
or PH375 Analytical Mechanics (3 cr.)
- PH480 Senior Physics Seminar (1-2 cr.)
- PH485 Graduate Assessments (0 cr.)

Physics Electives (17 cr.)

Includes : PH320, PH 330, PH 360, PH370, PH375, PH380, PH393, and PH410

Other Required Courses

- CH111 General Chemistry I (5 cr.)
- CH112 General Chemistry II (5 cr.)

Minor

Mathematics minor recommended as follows:

- MA161 Calculus I (4 cr.)
- MA163 Calculus II (4 cr.)
- MA211 Linear Algebra (3 cr.)
- MA265 Calculus III (3 cr.)
- MA361 Differential Equations (3 cr.)
- MA Electives (3 cr.)

Detailed course descriptions can be found at www.nmu.edu/bulletin.

Career Development

You should begin the resume-building process as soon as you can. The Academic and Career Advisement Center can assist you with career planning, while Career Services will help you fine tune your resume and look for jobs related to your field. In the meantime, the more hands-on experience you have, the better the chances are that you will find a job. Becoming involved in research within the department (theoretical physics, nuclear physics, neutron structure, astronomy) as well as a professional related internship is a way to develop your professional skills and gain experience. Your academic course work is important as well, so be sure to maintain a high grade point average.

Additional Considerations

Many of the positions listed may require education beyond the bachelor's degree. Practical work experience can increase your desirability for potential employers. Students should gain undergraduate research experience through departmental faculty and summer research programs.

Minors in different fields may be helpful when looking for work, and sometimes relevant work experience is more beneficial.

Remember to take any necessary exams early; it can take six weeks for results to be sent to the schools to which you applied.

Job Outlook

Physics will expand at a 9% rate in the coming years. Fields will grow at a faster-than-average rate. Salaries for positions heavily related to physics were \$62,470 to \$201,990 with a median salary in 2019 of \$122,220. Bureau of Labor Statistics, U.S. Department of Labor, Occupational Outlook Handbook, 2018-19 Edition, Physicists and Astronomers, on the Internet at <https://www.bls.gov/ooh/life-physical-and-social-science/physicists-and-astronomers.htm>.

Potential Careers

NMU's Physics Program prepares students for employment in the following careers:

- Astrophysicist
- Biophysicist
- Congressional Researcher
- Department of Defense
- Department of Energy
- Educator
- Engineering (Electrical, Mechanical, Chemical)
- Geophysicist
- Mathematician
- Medical Physicist
- NASA
- Oceanographer
- Peace Corps/VISTA Volunteer
- Physicist
- Research Technician
- Sales (Technical Products)
- Technical Librarian
- Technical Writer

Additional Resources and Information

For Career Planning and Opportunities:
Academic & Career Advisement Center
3302.1 C.B. Hedgcock
906-227-2971
www.nmu.edu/acac

Physics Department
2515 West Science
906-227-2450
www.nmu.edu/physics

For Job Search, Resume and Career Information:
Career Services
3302.3 C.B. Hedgcock
906-227-2800
www.nmu.edu/careers

For Information about NMU Student Organizations Associated with this Major Contact:
Center for Student Enrichment
1206 University Center
906-227-2439
www.nmu.edu/cse

Physics Club
ddonovan@nmu.edu

Internet Resource Links:
www.careers.org
www.bls.gov

For Career Information with National Organizations:
www.aps.org -American Physical Society
www.aip.org -American Institute of Physics
www.pha.jhu.edu -Society of Physics Students
www.bls.gov/ooh/life-physical-and-social-science/physicists-and-astronomers.htm -US Bureau of Labor Statistics



**NORTHERN MICHIGAN
UNIVERSITY**

MARQUETTE, MICHIGAN

The Academic & Career Advisement Center
2021



What to do with
a major in...

Physics

