Master of Science in Physics and Astrophysics

Admission Requirements

The applicant must meet the School of Graduate Studies' current minimum general admission rquirements as published in the graduate catalog.

1. A four-year bachelor's degree from a recognized college or university.
2. A cumulative Grade Point Average (GPA) of at least 2.75 for all undergraduate work (2.5 for M. Engr.) or a GPA of at least 3.0 for the junior and senior year of undergraduate work (based on a 4.0 scale).
3. Completed a minimum of 21 semester credits of undergraduate physics, plus mathematics through differential equations or the equivalent.
4. Coursework should include intermediate courses in mechanics, electricity and magnetism, optics, thermal physics, and modern quantum physics. Adequate preparation in general chemistry is also necessary.
5. Satisfy the School of Graduate Studies' English Language Proficiency requirements as published in the graduate catalog.
6. An applicant without satisfactory undergraduate training may be admitted to the program, but will be required to remove deficiencies by completing the necessary undergraduate courses without receiving graduate credit for them.
7. Ph.D. applicants are encouraged to submit the Graduate Record Examination scores for the general test and advanced physics test.

Degree Requirements

Students seeking the Master of Science degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Physics and Astrophysics Department.

The program is designed to provide the student with basic physics courses at the graduate level and an introduction to research.

1. Minimum of 30 semester credits in a major field, including the credits granted for the thesis and the research leading to the thesis.
2. At least one-half of the credits must be at or above the 500-level.
3. A maximum of one-fourth (usually 8-9 semester credits) of the credit hours required for the degree may be transferred from another institution.
4. Complete the following courses:

Code	Title	Credits
PHYS 509	Methods of Theoretical Physics	3
PHYS 539	Quantum Mechanics	3
PHYS 541	Theory Electricity Magnetism	3
PHYS 545	Analytical Mechanics	3

5. Complete six additional hours from the following:

Code	Title	Credits
PHYS 510	Methods of Theoretical Physics	3
PHYS 540	Quantum Mechanics	3
PHYS 542	Theory of Electricity and Magnetism	3

6. Complete research project and PHYS 998 Thesis (4-9 credits).

Five-year B.S.-M.S. Degree Program in Physics

Code	Title	Credits
PHYS 251	University Physics I	4
PHYS 252	University Physics II	4
PHYS 253	University Physics III	4
PHYS 317	Mechanics I	3
PHYS 318	Mechanics II	3
PHYS 324	Thermal Physics	3
PHYS 325	Optics	3
PHYS 325L	Optics Laboratory	1
PHYS 327	Electricity and Magnetism I	3
PHYS 328	Electricity and Magnetism II	3
PHYS 415	Undergrad Research Experience	3
PHYS 428	Advanced Physics Laboratory	2
PHYS 431	Quantum Mechanics I	3
PHYS 432	Quantum Mechanics II	3
PHYS 509	Methods of Theoretical Physics	3
PHYS 510	Methods of Theoretical Physics	3
PHYS 539	Quantum Mechanics	3
PHYS 540	Quantum Mechanics	3
PHYS 541	Theory Electricity Magnetism	3
PHYS 542	Theory of Electricity and Magnetism	3
PHYS 545	Analytical Mechanics	3
PHYS 590	Research	1-16
MATH 165	Calculus I	4
MATH 166	Calculus II	4
MATH 207	Introduction to Linear Algebra	2
MATH 265	Calculus III	4
MATH 266	Elementary Differential Equations	3
MATH 352	Introduction to Partial Differential Equations	3
CHEM 121	General Chemistry I	3
CHEM 121L	General Chemistry I Laboratory	1
CHEM 122	General Chemistry II	3
CHEM 122L	General Chemistry II Laboratory	1
Total Credits		**92-107**