

# Physics (Phys)

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 <<http://sdmines.sdsmt.edu/sdsmt/department/phys>>

## Program Overview

Physics examines the behavior and composition of matter and its interactions at the most fundamental level. It is concerned with the nature of physical reality—things that can be measured with instruments. Sub-fields within physics include solid-state or condensed matter physics, nuclear physics, high energy and particle (HEP) physics, biophysics, and astrophysics/cosmology. The curriculum provides a background in applications of physics for students seeking employment in industry and also provides a solid foundation for graduate study in physics or in other fields such as geophysics, meteorology, metallurgy, computer science, mathematics, materials science, and many branches of engineering.

## Labs and Facilities

The facilities in the Electrical Engineering-Physics building are equipped for all aspects of the department's experimental work from the introductory laboratories through graduate research. They enable students to observe physical phenomena, demonstrate physical principles, and learn techniques for making quantitative measurements in the fields of mechanics, heat, optics, electricity and magnetism, atomic physics, and solid state physics.

## Curriculum

The goal of the program of study in physics is to provide students with an understanding of the basic laws of physics and to help students develop skills that will enable them to further explore physical phenomena and to solve related problems. Students will be expected to develop a high level of mathematical skills and become proficient in oral and written communications. Laboratory skills are also emphasized.

## Curriculum Listing

<http://catalog.sdsmt.edu>  
 Physics Curriculum/Checklist

### Freshman Year

#### First Semester

MATH 123	Calculus I	4
CHEM 112	General Chemistry I	3
CHEM 112L	General Chemistry I Lab	1
ENGL 101	Composition I	3
PE	Physical Education	1
IS 110	Explorations	2
Humanities or Social Sciences Elective(s)		3
<b>TOTAL</b>		<b>17</b>

#### Second Semester

MATH 125	Calculus II	4
PHYS 211	University Physics I	3
PE	Physical Education	1
CHEM 114	General Chemistry II	3
CHEM 114L	Gen Chemistry II Lab	1
CSC 150	Computer Science I	3
<b>TOTAL</b>		<b>15</b>

### Sophomore Year

#### First Semester

MATH 225	Calculus III	4
PHYS 213	University Physics II	3
PHYS 213L	University Physics II Lab	1
PHYS 275	Relativity	3
ENGL 279	Technical Comm I	3
Humanities or Social Sciences Elective(s)		3
<b>TOTAL</b>		<b>17</b>

#### Second Semester

MATH 321	Differential Equations	4
EE 220	Circuits I	4
ENGL 289	Technical Comm II	3
Humanities or Social Sciences Elective(s)		6
<b>TOTAL</b>		<b>17</b>

### Junior Year

#### First Semester

MATH 432	Partial Differential Equations	3
PHYS 341	Thermodynamics	2
PHYS 343	Statistical Physics	2
PHYS 312	Exper. Physics Design I	2
CENG 244	Intro to Digital Systems	4
PHYS 451	Classical Mechanics	4
<b>TOTAL</b>		<b>17</b>

#### Second Semester

MATH 315	Linear Algebra	3
PHYS 471	Quantum Mechanics	4
PHYS 314	Exper. Physics Design II	2
Physics/Math/Computer Science Electives		6
<b>TOTAL</b>		<b>15</b>

### Senior Year

#### First Semester

PHYS 421	Electromagnetism	4
PHYS 361	Optics	3
PHYS 412	Advanced Design Projects I	2
PHYS 481	Mathematical Physics	4
Humanities or Social Sciences Elective(s)		2
<b>TOTAL</b>		<b>15</b>

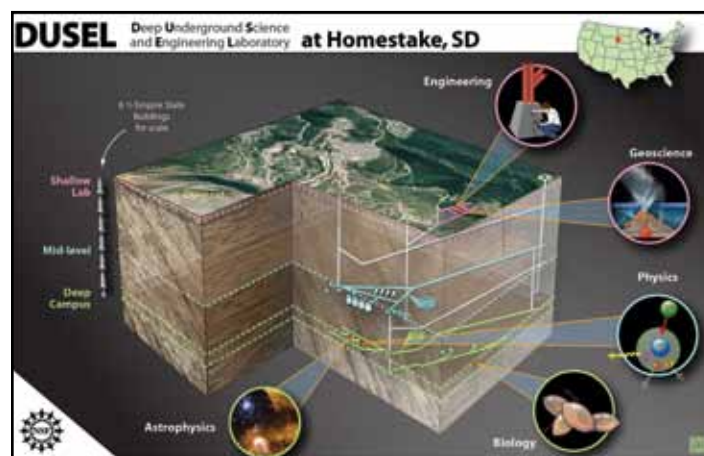
#### Second Semester

PHYS 433	Nuclear and Particle Physics	3
PHYS 439	Solid State Physics	4
PHYS 414	Advanced Design Projects II	2
Math/Physics Electives		3
Humanities or Social Sciences Elective(s)		3
<b>TOTAL</b>		<b>15</b>

### 128 credits required for graduation

At the end of the sophomore year, 12 hours of electives must include six hours in humanities (in two disciplines or in a sequence of foreign language courses) and six hours in social sciences (in two disciplines).

The electives must contain a minimum of 16 hours in social sciences and humanities and three hours of mathematics or computer science at the 200 level or above. 10 credit hours of military science may also be used as electives.



Deep Underground Science and Engineering Lab (DUSEL)