A Bachelor of Science degree in physics at NMSU prepares a student well for graduate study in physics, geophysics, or engineering or for a variety of careers in research and teaching. Specialization in one of the emphasis areas should increase employability at the BS level.

### Nondepartmental Requirements

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 191G</td>
<td>Calculus and Analytic Geometry I</td>
<td>4</td>
</tr>
<tr>
<td>MATH 192G</td>
<td>Calculus and Analytic Geometry II</td>
<td>4</td>
</tr>
<tr>
<td>MATH 291G</td>
<td>Calculus and Analytic Geometry III</td>
<td>3</td>
</tr>
<tr>
<td>MATH 392</td>
<td>Introduction to Ordinary Differential Equations</td>
<td>3</td>
</tr>
</tbody>
</table>

Select one of the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 111G &amp; CHEM 112G</td>
<td>General Chemistry I and General Chemistry II</td>
</tr>
<tr>
<td>CHEM 115 &amp; CHEM 116</td>
<td>Principles of Chemistry I and Principles of Chemistry II (or higher-level courses)</td>
</tr>
</tbody>
</table>

### Department Requirements

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 150</td>
<td>Elementary Computational Physics</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 213</td>
<td>Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 213 L</td>
<td>Experimental Mechanics</td>
<td>1</td>
</tr>
<tr>
<td>PHYS 214</td>
<td>Electricity and Magnetism</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 214 L</td>
<td>Electricity and Magnetism Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>PHYS 217</td>
<td>Heat, Light, and Sound</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 217 L</td>
<td>Experimental Heat, Light and Sound</td>
<td>1</td>
</tr>
<tr>
<td>PHYS 315</td>
<td>Modern Physics</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 315 L</td>
<td>Experimental Modern Physics</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 395</td>
<td>Intermediate Mathematical Methods of Physics</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 451</td>
<td>Intermediate Mechanics I</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 454</td>
<td>Intermediate Modern Physics I</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 455</td>
<td>Intermediate Modern Physics II</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 461</td>
<td>Intermediate Electricity and Magnetism</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 462</td>
<td>Intermediate Electricity and Magnetism II</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 480</td>
<td>Thermodynamics</td>
<td>3</td>
</tr>
</tbody>
</table>

Select an additional 6 credits in physics or geophysics numbered 300 or above.

### Advanced Laboratory

Select at least 3 credits from the following (in any combination):

- PHYS 471 | Modern Experimental Optics
- PHYS 475 | Advanced Physics Laboratory
- PHYS 493 | Experimental Nuclear Physics

### Electives

Select sufficient electives to bring total number of credits to 128, including 48 upper-division.

### Second Language Requirement: (required - see bottom of the page)

Total Credits: 128

---

1 May not be taken S/U and must earn a grade of C- or better.

Students who plan to pursue graduate study in physics or geophysics are strongly advised to take one or more senior-level courses in optics, nuclear physics, space physics, condensed matter physics, geophysics, or computational physics.

Students who plan to seek employment at the B.S. level are advised to take one of the following concentration area curricula in addition to the general and departmental requirements. The program of study should be chosen by the student in consultation with an advisor. Some recommended courses are listed below.

#### Concentration: Applied Optics

**Required Courses**

- PHYS 473 | Introduction to Optics | 4
- PHYS 478 | Fundamentals of Photonics | 4

**Total Credits:** 8

#### Concentration: Applied Physics

The program of study in applied physics is planned by the student and the physics advisor and includes 12 credits of upper division classes in electrical and mechanical engineering along with classes in computer science.

#### Concentration: Computational Physics

**Required Courses**

- C S 157 | Topics in Software Programming and Applications | 3
- or C S 150 C Programming
- C S 171G | Introduction to Computer Science | 4
- MATH 279 | Introduction to Higher Mathematics | 3
- PHYS 476 | Computational Physics | 3

**Total Credits:** 13

#### Concentration: Geophysics

**Required Courses**

- GEOL 111G | Introductory Geology | 4
- GPHY 340V | Planet Earth | 3
- GPHY 450 | Selected Topics | 3

Upper-division course in the general area of geophysics/geology

**Total Credits:** 13

1 For the geophysics concentration, students must take at least three credits of GPHY 450 Selected Topics.

2 The upper-division course should be agreed upon between the student and the geophysics advisor.

#### Concentration: Materials Science

**Required Courses**

- CHME 361 | Engineering Materials | 3
- PHYS 475 | Advanced Physics Laboratory | 3
- PHYS 488 | Introduction to Condensed Matter Physics | 3

---

1 May not be taken S/U and must earn a grade of C- or better.
PHYS 489 Introduction to Modern Materials 3

Total Credits 12

3 For the materials science concentration, students must take three credits of PHYS 475 Advanced Physics Laboratory.

Geophysics courses are offered by the Department of Physics and are listed under "Geophysics" in the course description chapter of this catalog.

Second Language Requirement
For the Bachelor of Science in the Physics there is a one year second language requirement, the student must do one of the following:

Option 1:
Complete two semesters from the following:
CHIN 111 Elementary Chinese I 4
or FREN 111 Elementary French I
or GER 111 Elementary German I
or JPNS 111 Elementary Japanese I
or SPAN 111 Elementary Spanish I

CHIN 112 Elementary Chinese II 4
or FREN 112 Elementary French II
or GER 112 Elementary German II
or JPNS 112 Elementary Japanese II
or SPAN 112 Elementary Spanish II

For Heritage Learners:
SPAN 213 Spanish for Heritage Learners II 3
or SPAN 214 Spanish for Heritage Learners III
or PORT 213 Portuguese for Romance Language Students I
or PORT 214 Portuguese for Romance Language Students II

Option 2:
Complete two semesters of American Sign Language (with a C- or better):
C D 374 American Sign Language I 3
C D 375 American Sign Language II 3

Option 3:
Challenge the 112 level for the following courses:
CHIN 112 Elementary Chinese II 4
or FREN 112 Elementary French II
or GER 112 Elementary German II
or SPAN 112 Elementary Spanish II

OR

Challenge the 213 level for the following courses:
PORT 213 Portuguese for Romance Language Students I 3
or SPAN 213 Spanish for Heritage Learners II

Option 4:
Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

Option 5:
Obtain college certification of completion of two years of a second language at the high school level with a grade of C- or higher in the second-year level.

Option 6:
By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

Option 7:
By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

Option 8:
In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

Dual Degree (BS/MS) Program
This program option is designed to provide a means for PHYS undergraduates to obtain both a BS and an MS degree with 146 credits (normally: BS=128 credits, MS=30 credits). Students electing this option will follow the regular undergraduate BS in physics curriculum, except that they take the advanced laboratory course at the 5XX level to meet their BS requirements. They also apply nine other credits of their undergraduate courses numbered 450 and higher towards their MS degree, requiring only an additional 18 credits for the MS. These 18 credits can be obtained in two semesters (and perhaps one summer term to write and defend an MS thesis). Students interested in this dual degree must be admitted to the MS in Physics graduate program and must fulfill all degree requirements for the MS in Physics.