DEPARTMENT OF PHYSICS
University of California, San Diego
http://www.physics.ucsd.edu

GENERAL PHYSICS MAJOR, B.A. DEGREE
SPECIALIZATION IN SECONDARY EDUCATION (PY31)
Total Units: 115-119

<table>
<thead>
<tr>
<th>Lower Division (66-70 units)</th>
<th>UNITS YET TO COMPLETE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physics 4A-B-C-D-E or 2A-B-C-D&lt;sup&gt;1&lt;/sup&gt;</td>
<td>20 or 16_____</td>
</tr>
<tr>
<td>Physics 2CL and 2DL</td>
<td>4_____</td>
</tr>
<tr>
<td>Math 18&lt;sup&gt;2&lt;/sup&gt; and 20A-B-C-D-E</td>
<td>24_____</td>
</tr>
<tr>
<td>SIO 50</td>
<td>6_____</td>
</tr>
<tr>
<td>Chemistry 6A-B-C and 7L</td>
<td>16_____</td>
</tr>
</tbody>
</table>

Upper Division (49 units)

1. Physics 100A-B, 105A, 110A-B, 120, 130A | 29_____ |

2. Restricted Electives - eight units of upper-division courses in Chemistry | 8_____ |
   Elective Courses Taken: ____________________________

3. EDS 129A-B-C | 12_____ |

MAJOR REGULATIONS

DOUBLE MAJORS A student with a double major must fulfill the separate requirements of each major, and the equivalent of at least ten upper-division courses (forty units) must be unique to each major. Courses taken in fulfillment of lower-division requirements may overlap to any degree.

GRADE REQUIREMENTS A grade point average of 2.0 or higher in the upper-division major is required for graduation. Students must receive a grade of C– or better in all courses to be applied to the major. In exceptional cases, students with a grade point average of 2.5 or higher in the upper-division major may petition to have one grade of D accepted; approval is not guaranteed.

P/NP GRADING OPTION Not allowed for any courses applied to the major.

PREREQUISITES Check the General Catalog for the prerequisites to all listed courses.

RESIDENCE REQUIREMENTS At least nine upper-division courses in the major while in residence at UC San Diego.

SUBSTITUTIONS Permissible only by approved petition.

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<sup>1</sup> For students completing the Physics 2 series, Physics 4E is recommended.
<sup>2</sup> The Linear Algebra course previously numbered Math 20F is acceptable.

To see a 4-year, quarter-by-quarter plan for this degree: Go to http://plans.ucsd.edu/
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GENERAL PHYSICS MAJOR, B.A. DEGREE

(PY30)

Total Units: 105

Lower Division (56 units)

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Units Yet to Complete</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physics 2A-B-C-D</td>
<td>16</td>
</tr>
<tr>
<td>Physics 2CL and 2DL</td>
<td>4</td>
</tr>
<tr>
<td>Math 18(^1) and 20A-B-C-D-E</td>
<td>24</td>
</tr>
<tr>
<td>One course from: MAE 3; CSE 30; Physics 105B</td>
<td>4</td>
</tr>
<tr>
<td>Two courses from: BILD 1, 2, 3; Chemistry 6A, 6B, 6C</td>
<td>8</td>
</tr>
</tbody>
</table>

Upper Division (49 units)

1. Physics 100A-B, 105A, 110A-B, 120, 130A, 140A or Chemistry 127 or 131              | 33                    |

2. Restricted electives:
   Sixteen units of upper-division courses in sciences and engineering (excluding mathematics)       | 16        |

Elective Courses Taken: ______________________________________________________________

MAJOR REGULATIONS

DOUBLE MAJORS.................................................................................. A student with a double major must fulfill the separate requirements of each major, and the equivalent of at least ten upper-division courses (forty units) must be unique to each major. Courses taken in fulfillment of lower-division requirements may overlap to any degree.

GRADE REQUIREMENTS ......................................................... A grade point average of 2.0 or higher in the upper-division major is required for graduation. Students must receive a grade of C– or better in all courses to be applied to the major. In exceptional cases, students with a grade point average of 2.5 or higher in the upper-division major may petition to have one grade of D accepted; approval is not guaranteed.

P/NP GRADING OPTION..................................................... Not allowed for any courses applied to the major (exceptions are courses completed via AP/IB, and Physics 199).

PREREQUISITES............................................................... Check the General Catalog for the prerequisites to all listed courses.

RESIDENCE REQUIREMENTS ............ At least eight upper-division courses in the major while in residence at UC San Diego.

SUBSTITUTIONS ........................................................ Permissible only by approved petition.

\(^1\) The Linear Algebra course previously numbered Math 20F is acceptable.

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### Lower Division (52 units)

<table>
<thead>
<tr>
<th>Course</th>
<th>Units Yet to Complete</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physics 4A-B-C-D-E or 2A-B-C-D</td>
<td>20 or 16</td>
</tr>
<tr>
<td>Physics 2CL and 2DL</td>
<td>4</td>
</tr>
<tr>
<td>Chemistry 6A or a programming course</td>
<td>4 or 8</td>
</tr>
<tr>
<td>Math 18 and 20A-B-C-D-E</td>
<td>24</td>
</tr>
</tbody>
</table>

### Upper Division (57 units)

A course that is listed in several areas cannot count towards more than one area and can satisfy only ONE of the major requirements:

1. Physics 100A-B, 105A, 110A, 120, 130A-B, 140A, and an additional laboratory course from the lab group: 122, 124, 133, 164 ................................................................. 37

2. Two courses from either the theoretical or experimental pre-grad-school sequence below ............... 8

   - Theoretical pre-grad-school sequence: Physics 100C, 105B, 110B, 130C, 140B
   - Experimental pre-grad-school sequence: Physics 100C, 110B, 124, 130C, 140B

3. It is recommended that students take three courses from the astrophysics sequence, but any three courses selected from the list below are acceptable ................................................................. 12

   - Physics 160, 161, 162, 163, 164, 223, 224, 226, 227, 228; **ECE 120, MAE 180A**

   **astrophysics sequence**

### MAJOR REGULATIONS

#### DOUBLE MAJORS

A student with a double major must fulfill the separate requirements of each major, and the equivalent of at least ten upper-division courses (forty units) must be unique to each major. Courses taken in fulfillment of lower-division requirements may overlap to any degree.

#### GRADE REQUIREMENTS

A grade point average of 2.0 or higher in the upper-division major is required for graduation. Students must receive a grade of C– or better in all courses to be applied to the major. In exceptional cases, students with a grade point average of 2.5 or higher in the upper-division major may petition to have one grade of D accepted; approval is not guaranteed.

#### P/NP GRADING OPTION

Not allowed for any courses applied to the major (exceptions are courses completed via AP/IB, and Physics 199).

#### PREREQUISITES

Check the **General Catalog** for the prerequisites to all listed courses.

#### RESIDENCE REQUIREMENTS

At least nine upper-division courses in the major while in residence at UC San Diego.

#### SUBSTITUTIONS

Permissible only by approved petition.

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1. The Physics 4 series is recommended, but the Physics 2 sequence is acceptable, in which case both Chemistry 6A and a programming course are required.
2. Programming course options: CENG 15; CSE 5A, 7, 8A, 11, 12, 86; MAE 8; NANO 15
3. The Linear Algebra course previously numbered Math 20F is acceptable.

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DEPARTMENT OF PHYSICS
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PHYSICS MAJOR, B.S. DEGREE
SPECIALIZATION: BIOPHYSICS (PY26)
Total Units: 116-125

Lower Division (68-72 units)

<table>
<thead>
<tr>
<th>Course</th>
<th>Units Yet to Complete</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physics 4A-B-C-D-E or 2A-B-C-D  1</td>
<td>20 or 16</td>
</tr>
<tr>
<td>Physics 2CL and 2DL</td>
<td>4</td>
</tr>
<tr>
<td>Chemistry 6A-B-C and 7L</td>
<td>16</td>
</tr>
<tr>
<td>BILD 1-2</td>
<td>8</td>
</tr>
<tr>
<td>Math 18 2 and 20A-B-C-D-E</td>
<td>24</td>
</tr>
</tbody>
</table>

Upper Division (48-53 units)

A course that is listed in several areas cannot count towards more than one area and can satisfy only ONE of the major requirements:

1. Physics 100A, 105A, 110A, 120, 130A, 140A, 173, 175 ...................................................... 33
2. One course from Physics 176, 177, 178 .................................................................................. 4
3. Chemistry 140A ....................................................................................................................... 3 or 4
4. Additional electives, to achieve a count of twelve upper-division courses in the major, may be selected from biology, chemistry and physics ................................................................. 8 or 12

Note: Premedical students will need to take two additional quarters of organic chemistry (Chemistry 140B and 140C), one quarter of organic chemistry laboratory (Chemistry 143A), and one quarter of an upper-division biology course. In addition, some medical schools also require a quarter of biochemistry (Biology BIBC 100 or Chemistry 114A). The premedical requirements may be used to satisfy elective requirements for upper-division courses.

MAJOR REGULATIONS

DOUBLE MAJORS ........................................... A student with a double major must fulfill the separate requirements of each major, and the equivalent of at least ten upper-division courses (forty units) must be unique to each major. Courses taken in fulfillment of lower-division requirements may overlap to any degree.

GRADE REQUIREMENTS .......... A grade point average of 2.0 or higher in the upper-division major is required for graduation. Students must receive a grade of C– or better in all courses to be applied to the major. In exceptional cases, students with a grade point average of 2.5 or higher in the upper-division major may petition to have one grade of D accepted; approval is not guaranteed.

P/NP GRADING OPTION .......... Not allowed for any courses applied to the major (exceptions are courses completed via AP/IB, and Physics 199).

PREREQUISITES ......................... Check the General Catalog for the prerequisites to all listed courses.

RESIDENCE REQUIREMENTS .......... At least eight upper-division courses in the major while in residence at UC San Diego.

SUBSTITUTIONS ......................... Permissible only by approved petition.

1 The Physics 4 series is strongly recommended.
2 The Linear Algebra course previously numbered Math 20F is acceptable.
3 If Chemistry 140A is completed at a community college it may transfer over as a 3-unit course.
4 If Chemistry 140A is completed at a community college it may transfer over as lower division course, in which case an additional 4-unit upper-division elective course must be completed in the major.

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University of California, San Diego
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PHYSICS MAJOR, B.S. DEGREE
SPECIALIZATION: COMPUTATIONAL PHYSICS (PY33)
Total Units: 121-125

Lower Division (52-56 units)

Physics 4A-B-C-D-E or 2A-B-C-D ................................................................. 20 or 16
Physics 2CL and 2DL ..................................................................................... 4
Chemistry 6A ................................................................................................. 4
Math 181 and 20A-B-C-D-E ............................................................................. 24
A programming course2 ................................................................................... 4

Upper Division (69 units)

A course that is listed in several areas cannot count towards more than one area and can satisfy only ONE of the major requirements:

1. Physics 100A-B, 105A-B, 110A, 120, 130A-B, 140A ......................................... 37
2. Two courses from Physics 122, 141, 142 ............................................................ 8
3. Restricted electives:
   Six restricted electives from the following groups: Physics 100C, 110B, 122, 124, 130C, 140B, 141, 142, 173, other upper division physics courses; Mathematics 170A-B-C, 179, 183; CSE 12, 30, 80; substitute elective courses3 ...................................................... 24
   Elective courses taken: ....................................................................................

MAJOR REGULATIONS

DOUBLE MAJORS ................................................. A student with a double major must fulfill the separate requirements of each major, and the equivalent of at least ten upper-division courses (forty units) must be unique to each major. Courses taken in fulfillment of lower-division requirements may overlap to any degree.

GRADE REQUIREMENTS ................................. A grade point average of 2.0 or higher in the upper-division major is required for graduation. Students must receive a grade of C– or better in all courses to be applied to the major. In exceptional cases, students with a grade point average of 2.5 or higher in the upper-division major may petition to have one grade of D accepted; approval is not guaranteed.

P/NP GRADING OPTION ................................. Not allowed for any courses applied to the major (exceptions are courses completed via AP/IB, and Physics 199).

PREREQUISITES ................................................. Check the General Catalog for the prerequisites to all listed courses.

RESIDENCE REQUIREMENTS .............................. At least nine upper-division courses in the major while in residence at UC San Diego.

SUBSTITUTIONS ............................................. Permissible only by approved petition.

1 The Linear Algebra course previously numbered Math 20F is acceptable.
2 Programming course options: CENG 15; CSE 5A, 7, 8A, 11, 12, 86; MAE 8; NANO 15
3 Upper-division science, mathematics, engineering courses may be applied via approved petition.

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DEPARTMENT OF PHYSICS  
University of California, San Diego  
http://www.physics.ucsd.edu

NAME ____________________________  
Date ___________  Student ID _____________

PHYSICS MAJOR, B.S. DEGREE  
SPECIALIZATION: EARTH SCIENCES (PY28)  
Total Units: 131-135

<table>
<thead>
<tr>
<th>Lower Division (62-66 units)</th>
<th>UNITS YET TO COMPLETE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physics 4A-B-C-D-E or 2A-B-C-D</td>
<td>20 or 16 ____</td>
</tr>
<tr>
<td>Physics 2CL and 2DL</td>
<td>4 ____</td>
</tr>
<tr>
<td>Chemistry 6A-B and 7L</td>
<td>12 ____</td>
</tr>
<tr>
<td>Math 18 and 20A-B-C-D-E</td>
<td>24 ____</td>
</tr>
<tr>
<td>SIO 50</td>
<td>6 ____</td>
</tr>
</tbody>
</table>

Upper Division (69 units)

A course that is listed in several areas cannot count towards more than one area and can satisfy only ONE of the major requirements:

1. Physics 100A-B, 105A, 110A-B, 120, 130A, 140A, and an additional laboratory course from the lab group: Physics 122, 124, 133, 164, 173 | 37 ____ |

2. SIO 102, 103, 120 | 12 ____ |

3. Two courses from either the theoretical or experimental pre-grad-school sequence below | 8 ____ |
   - Theoretical pre-grad-school sequence: Physics 100C, 105B, 110B, 130C, 140B
   - Experimental pre-grad-school sequence: Physics 100C, 110B, 124, 130C, 140B

4. Restricted electives:
   - Three earth sciences courses in the SIO department (upper-division or graduate level) to be chosen with the approval of the SIO undergraduate program advisor | 12 ____ |

Elective Courses Taken: ____________________________________________

**MAJOR REGULATIONS**

DOUBLE MAJORS: A student with a double major must fulfill the separate requirements of each major, and the equivalent of at least ten upper-division courses (forty units) must be unique to each major. Courses taken in fulfillment of lower-division requirements may overlap to any degree.

GRADE REQUIREMENTS: A grade point average of 2.0 or higher in the upper-division major is required for graduation. Students must receive a grade of C– or better in all courses to be applied to the major. In exceptional cases, students with a grade point average of 2.5 or higher in the upper-division major may petition to have one grade of D accepted; approval is not guaranteed.

P/NP GRADING OPTION: Not allowed for any courses applied to the major (exceptions are courses completed via AP/IB, and Physics 199).

PREREQUISITES: Check the General Catalog for the prerequisites to all listed courses.

RESIDENCE REQUIREMENTS: At least eleven upper-division courses in the major while in residence at UC San Diego.

SUBSTITUTIONS: Permissible only by approved petition.

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1 The Physics 4 series is strongly recommended.
2 The Linear Algebra course previously numbered Math 20F is acceptable.

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Physic Majors B.S. Degree
specialization: Materials (PY32)

Total units: 125-129

Lower Division (56-60 units)

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Units Yet to Complete</th>
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</thead>
<tbody>
<tr>
<td>Physics 4A-B-C-D-E or 2A-B-C-D</td>
<td>20 or 16</td>
</tr>
<tr>
<td>Physics 2CL and 2DL</td>
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<tr>
<td>Chemistry 6A-B</td>
<td>8</td>
</tr>
<tr>
<td>Math 18 and 20A-B-C-D-E</td>
<td>24</td>
</tr>
<tr>
<td>A programming course</td>
<td>4</td>
</tr>
</tbody>
</table>

Upper Division (69 units)


2. Four restrictive electives to be chosen from Chemistry 120A-B; Mathematics 120A; ECE 103, 134, 135A-B, 136, 136L; MAE 110A, 160; or an upper division physics course | 16 |

Major Regulations

Double Majors

A student with a double major must fulfill the separate requirements of each major, and the equivalent of at least ten upper-division courses (forty units) must be unique to each major. Courses taken in fulfillment of lower-division requirements may overlap to any degree.

Grade Requirements

A grade point average of 2.0 or higher in the upper-division major is required for graduation. Students must receive a grade of C– or better in all courses to be applied to the major. In exceptional cases, students with a grade point average of 2.5 or higher in the upper-division major may petition to have one grade of D accepted; approval is not guaranteed.

P/NP Grading Option

Not allowed for any courses applied to the major (exceptions are courses completed via AP/IB, and Physics 199).

Prerequisites

Check the General Catalog for the prerequisites to all listed courses.

Residence Requirements

At least eleven upper-division courses in the major while in residence at UC San Diego.

Substitutions

Permissible only by approved petition.

**Notes:**

1. The Physics 4 series is recommended.
2. Students who anticipate taking Chemistry 120A-B as an upper-division elective are strongly advised to take Chemistry 6C.
3. The Linear Algebra course previously numbered Math 20F is acceptable.
4. Programming course options: CENG 15; CSE 5A, 7, 8A, 11, 12, 86; MAE 8; NANO 15

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PHYSICS MAJOR, B.S. DEGREE (PY29)  
Total Units: 109

**Lower Division (52 units)**
- Physics 4A-B-C-D-E or Physics 2A-B-C-D\(^1\) ................................................................. 20 or 16____
- Physics 2CL and Physics 2DL ................................................................................................. 4____
- Chemistry 6A or a programming course\(^2\) ........................................................................ 4 or 8____
- Math 18\(^3\) and 20A-B-C-D-E .......................................................................................... 24____

**Units Yet To Complete**

**Upper Division (57 units)**

**A course that is listed in several areas cannot count towards more than one area and can satisfy only ONE of the major requirements:**

1. Physics 100A-B, 105A, 110A, 120, 130A-B, 140A, and an additional laboratory course from the lab group: Physics 122, 124, 133, 164, 173 ........................................................................................................... 37____

2. Two courses from either the theoretical or experimental pre-grad-school sequence below ............... 8____
   **Theoretical pre-grad-school sequence:** Physics 100C, 105B, 110B, 130C, 140B
   **Experimental pre-grad-school sequence:** Physics 100C, 110B, 124, 130C, 140B

3. Restricted Electives:
   - Three upper-division (four-unit) or graduate courses in physics or mathematics (only one)\(^4\) ................. 12____
   - Elective Courses Taken: ________________________________________________________________

**MAJOR REGULATIONS**

**DOUBLE MAJORS** .................................................. A student with a double major must fulfill the separate requirements of each major, and the equivalent of at least ten upper-division courses (forty units) must be unique to each major. Courses taken in fulfillment of lower-division requirements may overlap to any degree.

**GRADE REQUIREMENTS** ................................. A grade point average of 2.0 or higher in the upper-division major is required for graduation. Students must receive a grade of C– or better in all courses to be applied to the major. In exceptional cases, students with a grade point average of 2.5 or higher in the upper-division major may petition to have one grade of D accepted; approval is not guaranteed.

**P/NP GRADING OPTION** ................................. Not allowed for any courses applied to the major (exceptions are courses completed via AP/IB, and Physics 199).

**PREREQUISITES** ............................................. Check the General Catalog for the prerequisites to all listed courses.

**RESIDENCE REQUIREMENTS** ....................... At least nine upper-division courses in the major while in residence at UC San Diego.

**SUBSTITUTIONS** ........................................... Permissible only by approved petition.

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\(^1\) The Physics 4 series is recommended, but the Physics 2 sequence is acceptable, in which case both Chemistry 6A and a programming course are required.

\(^2\) Programming course options: CENG 15; CSE 5A, 7, 8A, 11, 12, 86; MAE 8; NANO 15

\(^3\) The Linear Algebra course previously numbered Math 20F is acceptable.

\(^4\) A max of one four-unit Physics 199 course can be applied. Courses in other science disciplines may be substituted by petition.

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