PHYSICS WITH TEACHER CERTIFICATION IN PHYSICS (PRESCHOOL-GRADE 12) (B.S.)

Students who wish to pursue P-12 teacher certification in must apply to and be admitted to the Teacher Education Program. Please visit the Teacher Education Program website (https://www.montclair.edu/center-of-pedagogy/) for the required professional sequence of courses and other important program requirements, guidelines, and procedures. Students are strongly advised to review the Teacher Education Program Handbook. Students majoring in physics have two teacher certification options to choose from – Physical Science or Physics – and should consult with an advisor to determine which certification program they wish to complete. Physics majors, with some additional chemistry courses, can qualify for Physical Science Teacher Certification. Courses specific to the Physics teacher certification program are listed below.

120 credits of coursework is required for the baccalaureate degree with a minimum 3.0 overall GPA. Major GPA requirements differ depending on field of study. Consult the Teacher Education Program Handbook for more information.

Program Requirements Overview

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>General Education Requirements</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>World Languages and Cultures Requirements</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Major Requirements</td>
<td>65-67</td>
</tr>
<tr>
<td></td>
<td>Teacher Education Program Requirements</td>
<td>37</td>
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<tr>
<td></td>
<td>Free Electives</td>
<td>1-0</td>
</tr>
<tr>
<td></td>
<td><strong>Total Credits</strong></td>
<td><strong>120-121</strong></td>
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</table>

Major Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 191</td>
<td>University Physics I</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 192</td>
<td>University Physics II</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 198</td>
<td>Introductory Physics Seminar</td>
<td>1</td>
</tr>
<tr>
<td>PHYS 210</td>
<td>Intermediate Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 220</td>
<td>Oscillations, Waves, and Optics</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 230</td>
<td>Intermediate Physics Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 300</td>
<td>Junior/Senior Physics Seminar</td>
<td>1</td>
</tr>
<tr>
<td>PHYS 320</td>
<td>Statistical and Thermal Physics</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 330</td>
<td>Advanced Physics Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 340</td>
<td>Electricity and Magnetism</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 360</td>
<td>Modern Physics</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 464</td>
<td>Quantum Mechanics</td>
<td>3</td>
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</tbody>
</table>

Physics Electives

Complete 3-4 credits from the list below.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 121</td>
<td>General Chemistry II</td>
<td>4</td>
</tr>
<tr>
<td>MATH 122</td>
<td>Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>or AMAT 120</td>
<td>Applied Calculus A</td>
<td>4</td>
</tr>
<tr>
<td>MATH 221</td>
<td>Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>or AMAT 220</td>
<td>Applied Calculus B</td>
<td>4</td>
</tr>
<tr>
<td>MATH 222</td>
<td>Calculus III</td>
<td>4</td>
</tr>
<tr>
<td>AMAT 350</td>
<td>Applied Mathematics I</td>
<td>3-4</td>
</tr>
<tr>
<td>or MATH 325</td>
<td>Ordinary Differential Equation</td>
<td></td>
</tr>
<tr>
<td>or PHYS 377</td>
<td>Mathematical Physics</td>
<td></td>
</tr>
</tbody>
</table>

Teacher Education Program Requirements

Teacher Education Program Requirements (Teacher Certification in Subject Area P-12) (http://catalog.montclair.edu/programs/teacher-education-program-requirements-p12/)

Other Content

General Education Requirements

Click here for a list of courses that fulfill General Education categories. (http://catalog.montclair.edu/programs/general-education-requirements-ba-bs/)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. New Student Seminar</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>C. Communication</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Writing</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>2. Literature</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>D. Fine and Performing Arts or F. Humanities</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Complete one course from D. Fine and Performing Arts, F1. Great Works and Their Influences or F2. Philosophical and Religious Perspectives.

### G. Computer Science
- CSIT 104 Python Programming I (Fulfilled in the major.)

### H. Mathematics
Fulfilled in the major.
- AMAT 120 Applied Calculus A
- or MATH 122 Calculus I

### I. Natural Science Laboratory
- PHYS 191 University Physics I (Fulfilled in the major.)

### J. Physical Education
Complete a 1 credit Physical Education course.

### K. Social Science
Complete one course from K1. American and European History or K2. Global and Cultural Perspectives or IIB. World Cultures.

#### 3. Social Science Perspectives
- EDFD 200 Psychological Foundations of Education (Fulfilled in the Teacher Education sequence.)

### L. Interdisciplinary Studies
- SASE 210 Public Purposes of Education: Democracy and Schooling (Fulfilled in the Teacher Education sequence.)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>World Languages</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>World Cultures</td>
<td>0</td>
</tr>
</tbody>
</table>

Fulfilled by either the K1 or K2 General Education category.

| Total Credits | 14 |

### World Languages and Cultures Requirements
Click here for a list of courses that fulfill World Languages and Cultures categories. (http://catalog.montclair.edu/programs/world-languages-and-cultures-requirements/)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>World Languages</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>World Cultures</td>
<td>0</td>
</tr>
</tbody>
</table>

Total Credits 3

### Recommended Roadmap to Degree Completion
This four-year plan is provided as an outline for students to follow in order to complete their degree requirements within four years. This plan is a recommendation and students should only use it in consultation with their academic advisor.

#### First Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>GENERAL EDUCATION:</td>
<td>1</td>
<td>GENERAL EDUCATION:</td>
<td>3</td>
</tr>
<tr>
<td>(A) New Student Seminar</td>
<td></td>
<td>(C2) Literature</td>
<td></td>
</tr>
<tr>
<td>GENERAL EDUCATION:</td>
<td>3</td>
<td>AMAT 220 or MATH 221</td>
<td>4</td>
</tr>
<tr>
<td>(C1) Writing</td>
<td></td>
<td>CHEM 121</td>
<td>4</td>
</tr>
<tr>
<td>AMAT 120 or MATH 122</td>
<td>4</td>
<td>EDFD 200</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 120</td>
<td></td>
<td>PHYS 192</td>
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<td>PHYS 191</td>
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<td></td>
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</table>

| Total Credits | 14 |

#### Second Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
</table>

| GENERAL EDUCATION D, F1 or F2 course | 3       |
| K1, K2 or WORLD CULTURES course     | 3-4     |
| MATH 222                          | 4       |
| CSIT 104                          | 3       |
| PHYS 210                          | 3       |
| SASE 210                          | 3       |

| Total Credits | 13-15 |

#### Third Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 220</td>
<td>3</td>
<td>GENERAL EDUCATION:</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(J) Physical Education</td>
<td></td>
</tr>
<tr>
<td>PHYS 230</td>
<td>4</td>
<td>World Language 1</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 300</td>
<td>1</td>
<td>PHYS 360</td>
<td>3</td>
</tr>
<tr>
<td>SASE 320</td>
<td>3</td>
<td>PHYS Elective course</td>
<td>3</td>
</tr>
<tr>
<td>SASE 321</td>
<td>3</td>
<td>SASE 322</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Free Elective</td>
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</table>

| Total Credits | 14-15 |

#### Fourth Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
<th>Spring</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>PHYS 330</td>
<td>4</td>
<td>SASE 452</td>
<td>3</td>
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<tr>
<td>PHYS 464</td>
<td>3</td>
<td>SASE 453</td>
<td>9</td>
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<tr>
<td>SASE 402</td>
<td>4</td>
<td>Students may not take</td>
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<tr>
<td></td>
<td></td>
<td>additional courses during</td>
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<tr>
<td></td>
<td></td>
<td>the Clinical II semester.</td>
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<tr>
<td>SASE 450</td>
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<tr>
<td>SASE 451</td>
<td>3</td>
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</table>

| Total Credits | 17-18 |

| Total Credits 120 |