PHYSICS MAJOR, WITH TEACHER CERTIFICATION IN PHYSICAL SCIENCE (PRESCHOOL-GRADE 12) (B.S.)

Students who wish to pursue P-12 teacher certification in Physical Science 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. Courses specific to the Physical Science 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

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

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

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>I. General Education</td>
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<td>7</td>
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<tr>
<td>A. Writing</td>
<td>New Student Seminar</td>
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<tr>
<td>C. Communication</td>
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</tr>
<tr>
<td>1. Literature</td>
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<tr>
<td>2. Literature</td>
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<tr>
<td>Complete one course from D. Fine and Performing Arts, F1. Great Works and Their Influences or F2. Philosophical and Religious Perspectives.</td>
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<tr>
<td>G. Computer Science</td>
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<tr>
<td>Fulfilled by CSIT 104 in the major.</td>
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<tr>
<td>H. Mathematics</td>
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<td>Fulfilled by MATH 122 in the major.</td>
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</tr>
<tr>
<td>I. Natural Science Laboratory</td>
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<td>Fulfilled by PHYS 191 in the major.</td>
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<tr>
<td>J. Physical Education</td>
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<tr>
<td>K. Social Science</td>
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<tr>
<td>Complete one course from K1. American and European History or K2. Global and Cultural Perspectives or IIB. World Cultures.</td>
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<td>3. Social Science Perspectives – Fulfilled by EDFD 200 in the Teacher Education sequence.</td>
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<td>L. Interdisciplinary Studies</td>
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<tr>
<td>Fulfilled by SASE 210 in the Teacher Education sequence.</td>
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<tr>
<td>II. World Languages</td>
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<tr>
<td>A. World Languages</td>
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<td>B. World Cultures - counted in K3. above.</td>
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<td>III. Major Requirements</td>
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<tr>
<td>A. Physics Core</td>
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<tr>
<td>PHYS 191</td>
<td>University Physics I</td>
<td>4</td>
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<tr>
<td>PHYS 192</td>
<td>University Physics II</td>
<td>4</td>
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<tr>
<td>PHYS 198</td>
<td>Introductory Physics Seminar</td>
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<tr>
<td>PHYS 210</td>
<td>Intermediate Mechanics</td>
<td>3</td>
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<tr>
<td>PHYS 220</td>
<td>Oscillations, Waves, and Optics</td>
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<td>PHYS 230</td>
<td>Intermediate Physics Laboratory</td>
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<td>PHYS 300</td>
<td>Junior/Senior Physics Seminar</td>
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<td>PHYS 320</td>
<td>Statistical and Thermal Physics</td>
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<tr>
<td>PHYS 330</td>
<td>Advanced Physics Laboratory</td>
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<tr>
<td>PHYS 340</td>
<td>Electricity and Magnetism</td>
<td>3</td>
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<tr>
<td>PHYS 360</td>
<td>Modern Physics</td>
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<tr>
<td>B. Physics Electives</td>
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<tr>
<td>Complete 3 credits from the list below.</td>
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<tr>
<td>C. Collateral Requirements</td>
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<tr>
<td>MATH 122</td>
<td>Calculus I</td>
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<tr>
<td>MATH 221</td>
<td>Calculus II</td>
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<tr>
<td>MATH 222</td>
<td>Calculus III</td>
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<tr>
<td>CSIT 104</td>
<td>Computational Concepts</td>
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<tr>
<td>CHEM 120</td>
<td>General Chemistry I</td>
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<tr>
<td>CHEM 121</td>
<td>General Chemistry II</td>
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<td>CHEM 230</td>
<td>Organic Chemistry I</td>
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<td>CHEM 232</td>
<td>Experimental Organic Chemistry I</td>
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<td>Complete an additional 2 credits of CHEM courses.</td>
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<td>IV. Teacher Education Sequence</td>
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<td>See requirements below.</td>
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Total Credits 120

Major Electives

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<th>Code</th>
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<tbody>
<tr>
<td>PHYS 180</td>
<td>Astronomy for Everyone</td>
<td>4</td>
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<tr>
<td>PHYS 245</td>
<td>Fundamentals of Electronics</td>
<td>4</td>
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<tr>
<td>PHYS 280</td>
<td>Astronomy for Physicists</td>
<td>4</td>
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<tr>
<td>PHYS 310</td>
<td>Advanced Mechanics</td>
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<tr>
<td>PHYS 325</td>
<td>Computational Physics</td>
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<tr>
<td>PHYS 341</td>
<td>Electronics and Digital Circuits</td>
<td>4</td>
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<tr>
<td>PHYS 350</td>
<td>Modern Optics</td>
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<tr>
<td>PHYS 368</td>
<td>Fluid Mechanics</td>
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<tr>
<td>PHYS 377</td>
<td>Mathematical Physics</td>
<td>3</td>
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<td>PHYS 380</td>
<td>Observational Astronomy</td>
<td>4</td>
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<tr>
<td>PHYS 399</td>
<td>Special Topics in Physics</td>
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<tr>
<td>PHYS 445</td>
<td>Radiation and Medical Physics</td>
<td>3</td>
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<tr>
<td>PHYS 461</td>
<td>Special and General Relativity</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 462</td>
<td>Nuclear Physics</td>
<td>3</td>
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<tr>
<td>PHYS 464</td>
<td>Quantum Mechanics</td>
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<td>PHYS 470</td>
<td>Solid State Physics</td>
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<td>PHYS 480</td>
<td>Astrophysics</td>
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<tr>
<td>PHYS 495</td>
<td>Research or Independent Study in Physics</td>
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### Teacher Ed Program Requirements (P-12)

#### Teacher Ed Pre-Requisite Requirements

<table>
<thead>
<tr>
<th>Code</th>
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<tbody>
<tr>
<td>EDFD 200</td>
<td>Psychological Foundations of Education</td>
<td>3</td>
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<tr>
<td>or PSYC 200</td>
<td>Educational Psychology</td>
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<tr>
<td>or FSHD 216</td>
<td>Adolescent Development</td>
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<tr>
<td>SASE 210</td>
<td>Public Purposes of Education: Democracy and Schooling</td>
<td>3</td>
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#### Professional Sequence

#### Professional Sequence Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>SASE 320</td>
<td>Curriculum Design for Inclusive Classrooms</td>
<td>3</td>
</tr>
<tr>
<td>SASE 321</td>
<td>Assessment Practices for Inclusive Classrooms</td>
<td>3</td>
</tr>
<tr>
<td>SASE 322</td>
<td>Language and Learning in Content Area Teaching</td>
<td>3</td>
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#### Methods Course(s)

Select a Teaching Methods course or courses according to major: 3-7

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ARED 401</td>
<td>Foundations of Methods and Curriculum in Art Education II: P-12 (Visual Arts major.)</td>
<td>3-7</td>
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<tr>
<td>DNCE 402</td>
<td>Dance Methods (Dance major.)</td>
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<tr>
<td>ENGL 471</td>
<td>Teaching English (secondary) (English major.)</td>
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<tr>
<td>FREN 419</td>
<td>Teaching French in P-12: Practice (French major.)</td>
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<tr>
<td>HLTH 401</td>
<td>The Teaching of Health</td>
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<tr>
<td>&amp; PEMJ 457</td>
<td>and Teaching of Secondary Physical Education (Physical Education major.)</td>
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<tr>
<td>ITAL 419</td>
<td>The Teaching of Italian in Elementary and Secondary Schools (Italian major.)</td>
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<tr>
<td>LATN 419</td>
<td>Methods of Teaching Latin (Latin major.)</td>
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<tr>
<td>LNGN 403</td>
<td>Methods and Material of TESL (Linguistics major.)</td>
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<tr>
<td>MATH 470</td>
<td>Teaching of Mathematics (Mathematics major)</td>
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<tr>
<td>MUED 320</td>
<td>Music Classroom Methods I</td>
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<tr>
<td>&amp; MUED 321</td>
<td>and Music Classroom Methods II (Music major.)</td>
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<tr>
<td>PHED 401</td>
<td>The Teaching of Science in Secondary Schools (Biology, Chemistry, Earth &amp; Environmental Science, or Physics majors.)</td>
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<tr>
<td>SOSC 401</td>
<td>Methods of Teaching Social Studies (Geography, History, Political Science, Psychology, or Sociology majors.)</td>
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<tr>
<td>SPAN 421</td>
<td>Special Topics in Teaching Spanish K-12 (Spanish major.)</td>
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#### Professional Year Courses

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<tr>
<th>Code</th>
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<tbody>
<tr>
<td>SASE 450</td>
<td>Clinical Practice I</td>
<td>3</td>
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<tr>
<td>SASE 451</td>
<td>Seminar in Inclusive Pedagogies</td>
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<tr>
<td>SASE 452</td>
<td>Advanced Seminar in Inclusive Pedagogies</td>
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<tr>
<td>SASE 453</td>
<td>Clinical Practice II</td>
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Total Credits 36-40