EARTH AND ENVIRONMENTAL SCIENCE (B.S.) (COMBINED B.S./M.A.T. WITH TEACHER CERTIFICATION IN EARTH SCIENCE (PRESCHOOL-GRADE 12) AND TEACHER OF STUDENTS WITH DISABILITIES)

The Dual Degree Dual Certification program is a 5-year program that leads to teacher certification in Earth Science (grades P-12), teacher certification in Teacher of Students with Disabilities, a baccalaureate degree and a master's degree. Interested students must apply to and be admitted to the Teacher Education Program as an undergraduate. Students must successfully complete the undergraduate portion of the program in order to be admitted to the Graduate School and complete the one-year master's portion of the program.

Please visit the Teacher Education Program website (https://www.montclair.edu/cehs/academics/centers-and-institutes/cop/teacher) for the required undergraduate professional sequence of courses, overall course outline, and other important Program requirements, guidelines, and procedures. Students also are strongly advised to review the Teacher Education Program Handbook.

A minimum of 120 credits of coursework is required for the baccalaureate degree with a minimum 3.0 overall GPA; however more than 120 credits may be required depending upon the major field of study. Major GPA requirements differ depending on field of study. Consult the Teacher Education Program Handbook for more information.

Program Requirements

Students must complete 42 credits of General Education requirements (http://catalog.montclair.edu/undergraduate-graduate-degree-requirements/general-education-requirements) and 3-9 credits of World Languages and Cultures Requirements (http://catalog.montclair.edu/undergraduate-graduate-degree-requirements/world-languages-cultures-requirement).

Requirements for the graduate portion of this program can be found here (http://catalog.montclair.edu/programs/teaching-certification-earth-science-preschool-grade-12-students-disabilities-combined-ba-mat).

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 120</td>
<td>General Chemistry I</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 121</td>
<td>General Chemistry II</td>
<td>4</td>
</tr>
</tbody>
</table>

Collateral Math Courses

Select one of the following sequences:

Math Sequence A

- MATH 111 Applied Precalculus
- or MATH 112 Precalculus Mathematics
- MATH 116 Calculus A

Math Sequence B

- MATH 122 Calculus I
- & MATH 221 and Calculus II

Collateral Physics Courses

Select one of the following sequences:

Physics Sequence A

- PHYS 191 University Physics I
- & PHYS 192 and University Physics II

Physics Sequence B

- PHYS 193 College Physics I
- & PHYS 194 and College Physics II

Collateral Biology Courses

- BIOL 112 Principles of Biology I
- or BIOL 113 Principles of Biology II

Major Electives

Meteorology
- EAES 201 Understanding Weather and Climate

Astronomy

Select one of the following:

- PHYS 180 Descriptive Astronomy
- PHYS 280 Astronomy
- PHYS 380 Observational Astronomy

Oceanography

- EAES 150 General Oceanography

Graduate Courses

Select one of the following (course will also count toward the MAT portion of this program):

- BIOL 570 Ecology
- EAES 505 Environmental Geoscience
- EAES 507 Tectonics
- EAES 508 Field Geology
- EAES 509 Current Issues in Sustainability Science
- EAES 510 Geographic Information Systems
- EAES 511 Fundamentals of Remote Sensing of the Environment
- EAES 524 Igneous and Metamorphic Geology
- EAES 525 X-ray Microanalysis
- EAES 526 Geochemistry
- EAES 527 Organic Geochemistry
- EAES 528 Environmental Forensics
- EAES 529 Instrumental Environmental Analysis
- EAES 531 Hydroclimatology
- EAES 532 Applied Groundwater Modeling
- EAES 533 Water Resource Management
- EAES 535 Geophysics

Code  Title                      Credits
---  -----------------------------  -----
EAES 105  Physical Geology                  4
EAES 220  Mineralogy                        4
EAES 240  Historical Geology                4
EAES 302  Structural Geology                3
EAES 320  Igneous Metamorphic Petrology     4
EAES 342  Invertebrate Paleobiology         4
EAES 441  Stratigraphy                      4

Collateral Chemistry Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 120</td>
<td>General Chemistry I</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 121</td>
<td>General Chemistry II</td>
<td>4</td>
</tr>
</tbody>
</table>

Collateral Math Courses

Select one of the following sequences:

Math Sequence A

- MATH 111 Applied Precalculus
- or MATH 112 Precalculus Mathematics
- MATH 116 Calculus A

Math Sequence B

- MATH 122 Calculus I
- & MATH 221 and Calculus II

Collateral Physics Courses

Select one of the following sequences:

Physics Sequence A

- PHYS 191 University Physics I
- & PHYS 192 and University Physics II

Physics Sequence B

- PHYS 193 College Physics I
- & PHYS 194 and College Physics II

Collateral Biology Courses

- BIOL 112 Principles of Biology I
- or BIOL 113 Principles of Biology II

Major Electives

Meteorology
- EAES 201 Understanding Weather and Climate

Astronomy

Select one of the following:

- PHYS 180 Descriptive Astronomy
- PHYS 280 Astronomy
- PHYS 380 Observational Astronomy

Oceanography

- EAES 150 General Oceanography

Graduate Courses

Select one of the following (course will also count toward the MAT portion of this program):

- BIOL 570 Ecology
- EAES 505 Environmental Geoscience
- EAES 507 Tectonics
- EAES 508 Field Geology
- EAES 509 Current Issues in Sustainability Science
- EAES 510 Geographic Information Systems
- EAES 511 Fundamentals of Remote Sensing of the Environment
- EAES 524 Igneous and Metamorphic Geology
- EAES 525 X-ray Microanalysis
- EAES 526 Geochemistry
- EAES 527 Organic Geochemistry
- EAES 528 Environmental Forensics
- EAES 529 Instrumental Environmental Analysis
- EAES 531 Hydroclimatology
- EAES 532 Applied Groundwater Modeling
- EAES 533 Water Resource Management
- EAES 535 Geophysics

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 120</td>
<td>General Chemistry I</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 121</td>
<td>General Chemistry II</td>
<td>4</td>
</tr>
</tbody>
</table>

Collateral Math Courses

Select one of the following sequences:

Math Sequence A

- MATH 111 Applied Precalculus
- or MATH 112 Precalculus Mathematics
- MATH 116 Calculus A

Math Sequence B

- MATH 122 Calculus I
- & MATH 221 and Calculus II

Collateral Physics Courses

Select one of the following sequences:

Physics Sequence A

- PHYS 191 University Physics I
- & PHYS 192 and University Physics II

Physics Sequence B

- PHYS 193 College Physics I
- & PHYS 194 and College Physics II

Collateral Biology Courses

- BIOL 112 Principles of Biology I
- or BIOL 113 Principles of Biology II

Major Electives

Meteorology
- EAES 201 Understanding Weather and Climate

Astronomy

Select one of the following:

- PHYS 180 Descriptive Astronomy
- PHYS 280 Astronomy
- PHYS 380 Observational Astronomy

Oceanography

- EAES 150 General Oceanography

Graduate Courses

Select one of the following (course will also count toward the MAT portion of this program):

- BIOL 570 Ecology
- EAES 505 Environmental Geoscience
- EAES 507 Tectonics
- EAES 508 Field Geology
- EAES 509 Current Issues in Sustainability Science
- EAES 510 Geographic Information Systems
- EAES 511 Fundamentals of Remote Sensing of the Environment
- EAES 524 Igneous and Metamorphic Geology
- EAES 525 X-ray Microanalysis
- EAES 526 Geochemistry
- EAES 527 Organic Geochemistry
- EAES 528 Environmental Forensics
- EAES 529 Instrumental Environmental Analysis
- EAES 531 Hydroclimatology
- EAES 532 Applied Groundwater Modeling
- EAES 533 Water Resource Management
- EAES 535 Geophysics

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 120</td>
<td>General Chemistry I</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 121</td>
<td>General Chemistry II</td>
<td>4</td>
</tr>
</tbody>
</table>

Collateral Math Courses

Select one of the following sequences:

Math Sequence A

- MATH 111 Applied Precalculus
- or MATH 112 Precalculus Mathematics
- MATH 116 Calculus A

Math Sequence B

- MATH 122 Calculus I
- & MATH 221 and Calculus II

Collateral Physics Courses

Select one of the following sequences:

Physics Sequence A

- PHYS 191 University Physics I
- & PHYS 192 and University Physics II

Physics Sequence B

- PHYS 193 College Physics I
- & PHYS 194 and College Physics II

Collateral Biology Courses

- BIOL 112 Principles of Biology I
- or BIOL 113 Principles of Biology II

Major Electives

Meteorology
- EAES 201 Understanding Weather and Climate

Astronomy

Select one of the following:

- PHYS 180 Descriptive Astronomy
- PHYS 280 Astronomy
- PHYS 380 Observational Astronomy

Oceanography

- EAES 150 General Oceanography

Graduate Courses

Select one of the following (course will also count toward the MAT portion of this program):

- BIOL 570 Ecology
- EAES 505 Environmental Geoscience
- EAES 507 Tectonics
- EAES 508 Field Geology
- EAES 509 Current Issues in Sustainability Science
- EAES 510 Geographic Information Systems
- EAES 511 Fundamentals of Remote Sensing of the Environment
- EAES 524 Igneous and Metamorphic Geology
- EAES 525 X-ray Microanalysis
- EAES 526 Geochemistry
- EAES 527 Organic Geochemistry
- EAES 528 Environmental Forensics
- EAES 529 Instrumental Environmental Analysis
- EAES 531 Hydroclimatology
- EAES 532 Applied Groundwater Modeling
- EAES 533 Water Resource Management
- EAES 535 Geophysics

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 120</td>
<td>General Chemistry I</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 121</td>
<td>General Chemistry II</td>
<td>4</td>
</tr>
</tbody>
</table>
Earth and Environmental Science (B.S.) (Combined B.S./M.A.T. with Teacher Certification in Earth Science (Preschool-Grade 12) and Teacher of Students with Disabilities)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>EAES 541</td>
<td>Stratigraphy</td>
</tr>
<tr>
<td>EAES 550</td>
<td>Advanced Marine Geology</td>
</tr>
<tr>
<td>EAES 551</td>
<td>Coastal Geomorphology</td>
</tr>
<tr>
<td>EAES 586</td>
<td>Urban Contamination</td>
</tr>
<tr>
<td>EAES 592</td>
<td>Pro Seminar</td>
</tr>
<tr>
<td>EAES 599</td>
<td>Special Problems in Earth and Environmental Studies</td>
</tr>
<tr>
<td>EAES 610</td>
<td>Spatial Analysis</td>
</tr>
<tr>
<td>EAES 611</td>
<td>Advanced Environmental Remote Sensing and Image Processing</td>
</tr>
<tr>
<td>EAES 662</td>
<td>Energy and the Environment</td>
</tr>
<tr>
<td>EAES 700</td>
<td>Earth Systems Science</td>
</tr>
<tr>
<td>PHYS 519</td>
<td>Special Topics in Physics</td>
</tr>
</tbody>
</table>

**Total Credits:** 67-68

**Teacher Ed Program Requirements (P-12, Bachelor's/MAT)**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Teacher Ed Pre-Requisite Requirements</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Health for Teacher Education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Select one of the following:</td>
<td>3-4</td>
<td></td>
</tr>
<tr>
<td>BIOL 100</td>
<td>Biological Sciences</td>
<td></td>
</tr>
<tr>
<td>BIOL 107</td>
<td>Biology for Survival</td>
<td></td>
</tr>
<tr>
<td>BIOL 110</td>
<td>The Biology of Human Life</td>
<td></td>
</tr>
<tr>
<td>BIOL 215</td>
<td>Human Heredity</td>
<td></td>
</tr>
<tr>
<td>BIOL 240</td>
<td>Mammalian Anatomy and Physiology I</td>
<td></td>
</tr>
<tr>
<td>BIOL 241</td>
<td>Mammalian Anatomy and Physiology II</td>
<td></td>
</tr>
<tr>
<td>BIOL 243</td>
<td>Human Anatomy and Physiology</td>
<td></td>
</tr>
<tr>
<td>BIOL 380</td>
<td>Genetics</td>
<td></td>
</tr>
<tr>
<td>HLTH 101</td>
<td>Personal Health Issues</td>
<td></td>
</tr>
<tr>
<td>HLTH 207</td>
<td>Injury Prevention and Emergency Care</td>
<td></td>
</tr>
<tr>
<td>HLTH 208</td>
<td>Study of Human Diseases</td>
<td></td>
</tr>
<tr>
<td>HLTH 213</td>
<td>Perspectives on Drugs</td>
<td></td>
</tr>
<tr>
<td>HLTH 220</td>
<td>Mental Health</td>
<td></td>
</tr>
<tr>
<td>HLTH 290</td>
<td>Human Sexuality</td>
<td></td>
</tr>
<tr>
<td>HLTH 330</td>
<td>Health Education Methods</td>
<td></td>
</tr>
<tr>
<td>HLTH 411</td>
<td>School Health and Community Services</td>
<td></td>
</tr>
<tr>
<td>HLTH 430</td>
<td>Counseling Skills for Public Health Professionals</td>
<td></td>
</tr>
<tr>
<td>HONP 210</td>
<td>Honors Seminar in Science</td>
<td></td>
</tr>
<tr>
<td>HONP 211</td>
<td>Honors Seminar in Contemporary Issues in Science</td>
<td></td>
</tr>
<tr>
<td>HPEM 150</td>
<td>Principles and Practice of Emergency Care</td>
<td></td>
</tr>
<tr>
<td>NUFD 182</td>
<td>Nutrition: A Socioecological Perspective</td>
<td></td>
</tr>
<tr>
<td><strong>Speech for Teacher Education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CMST 101</td>
<td>Fundamentals of Speech: Communication Requirement</td>
<td>3</td>
</tr>
</tbody>
</table>

**Additional Teacher Ed Pre-Requisites**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDFD 200</td>
<td>Psychological Foundations of Education</td>
<td>3</td>
</tr>
<tr>
<td>or PSYC 200</td>
<td>Educational Psychology</td>
<td></td>
</tr>
<tr>
<td>EDFD 220</td>
<td>Philosophical Orientation to Education</td>
<td>3</td>
</tr>
<tr>
<td>EDFD 221</td>
<td>Historical Foundations of American Education</td>
<td>3</td>
</tr>
</tbody>
</table>

Select one of the following: 3

**Undergraduate Professional Sequence I**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>SASE 305</td>
<td>Teaching for Equity and Diversity</td>
<td>3</td>
</tr>
<tr>
<td>SASE 312</td>
<td>Educating English Language Learners</td>
<td>1</td>
</tr>
<tr>
<td>SPED 279</td>
<td>Foundation and Philosophy of Inclusive Education</td>
<td>3</td>
</tr>
</tbody>
</table>

**Undergraduate Professional Sequence II**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>READ 411</td>
<td>Language and Literacy</td>
<td>3</td>
</tr>
<tr>
<td>SPED 367</td>
<td>Language-Based Strategies for Inclusive Classrooms</td>
<td>3</td>
</tr>
</tbody>
</table>

**Undergraduate Professional Sequence III**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPED 469</td>
<td>Inclusive Methods for Middle and Secondary Schools</td>
<td>3</td>
</tr>
<tr>
<td>SPED 488</td>
<td>Promoting Prosocial Behaviors in Inclusive Settings</td>
<td>3</td>
</tr>
</tbody>
</table>

**Graduate Sequence**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPED 566</td>
<td>Creating Curricular Access for Adolescents with Disabilities</td>
<td>3</td>
</tr>
<tr>
<td>SPED 586</td>
<td>Educational Planning for Adolescents with Disabilities</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total Credits:** 43-44

1 Or pass the MSU Health Knowledge Test available through the Center of Pedagogy.

2 Courses will also count toward graduate portion of this program.