CHEMISTRY, B.S.ED.

The BSE-CHEM degree leads to certification to teach chemistry at the secondary level in the public schools of the Commonwealth of Pennsylvania. Millersville University’s Chemistry Education program allows you to pursue a comprehensive study of the scientific discipline while gaining the skills to teach 7th to 12th grade students. By successfully completing this program, students earn a Bachelor of Science in Education (B.S.E.) degree with a certification in Secondary Chemistry Education and are prepared for Pennsylvania licensure exams.

Major in Chemistry, BSE

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Credits Required for Major</td>
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</tr>
<tr>
<td></td>
<td>Minimum GPA 2.0 for Major</td>
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</tr>
<tr>
<td></td>
<td>Minimum Residency 50% of Major Courses</td>
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CHEM 188 WAIVED FOR TRANSFER STUDENTS

100 AND 200 LEVEL CHEMISTRY REQUIREMENTS

<table>
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<tr>
<th>Code</th>
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<tbody>
<tr>
<td>CHEM 111</td>
<td>Introductory Chemistry 1 (C minimum)</td>
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<tr>
<td>CHEM 112</td>
<td>Introductory Chemistry 2 (C minimum)</td>
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<tr>
<td>CHEM 231</td>
<td>Organic Chemistry 1 (C minimum)</td>
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<tr>
<td>CHEM 232</td>
<td>Organic Chemistry 2 (C minimum)</td>
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<td>CHEM 251</td>
<td>Inorganic Chemistry 1 (C minimum)</td>
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<tr>
<td>CHEM 265</td>
<td>Quantitative Analysis (C minimum)</td>
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300 AND 400 LEVEL CHEMISTRY REQUIREMENTS

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<tr>
<td>CHEM 326</td>
<td>Biochemistry 1</td>
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<tr>
<td>CHEM 341</td>
<td>Physical Chemistry 1</td>
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<tr>
<td>CHEM 342</td>
<td>Physical Chemistry 2</td>
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<td>CHEM 375</td>
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<td>CHEM 487</td>
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<tr>
<td>CHEM 488</td>
<td>Seminar in Chemistry 2</td>
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Total Hours 4

Professional Education

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<tr>
<th>Code</th>
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<tbody>
<tr>
<td></td>
<td>EDUCATIONAL FOUNDATIONS</td>
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</tr>
<tr>
<td>EDFN 211</td>
<td>Foundations Modern Education</td>
<td>3</td>
</tr>
<tr>
<td>EDFN 241</td>
<td>Psychological Foundations of Teaching</td>
<td>3</td>
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<td></td>
<td>REQUIRED EDUCATION COURSES</td>
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<tr>
<td>EDSE 321</td>
<td>Issues in Secondary Education</td>
<td>3</td>
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<tr>
<td>EDSE 330</td>
<td>Instructional Technology, Design &amp; Assessment</td>
<td>3</td>
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<tr>
<td>EDSE 435</td>
<td>Teaching of Science in Secondary Schools</td>
<td>3</td>
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<tr>
<td></td>
<td>ACCOMMODATIONS AND ADAPTATIONS</td>
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<tr>
<td>EDSE 340</td>
<td>Content Area Literacy for Diverse Classrooms</td>
<td>3</td>
</tr>
<tr>
<td>SPED 346</td>
<td>Secondary Students w/Disabilities in Inclusive Settings</td>
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STUDENT TEACHING

<table>
<thead>
<tr>
<th>Code</th>
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<tbody>
<tr>
<td>EDSE 471</td>
<td>Student Teaching Seminar</td>
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<tr>
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<td>Student Teaching</td>
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<tr>
<td>EDSC 461</td>
<td>Student Teaching in Science</td>
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Total Hours 33

Req Related for Chemistry, BSE

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td></td>
<td>MATHEMATICS</td>
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<tr>
<td>MATH 161</td>
<td>Calculus 1</td>
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<td>MATH 163H</td>
<td>Honors Calculus 1</td>
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<td>MATH 211</td>
<td>Calculus 2</td>
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<td>MATH 311</td>
<td>Calculus 3</td>
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<td></td>
<td>PHYSICS</td>
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<tr>
<td>PHYS 231</td>
<td>Physics 1 with Calculus</td>
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<tr>
<td>PHYS 232</td>
<td>Physics 2 with Calculus</td>
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<tr>
<td></td>
<td>BIOLOGY</td>
<td></td>
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<tr>
<td></td>
<td>General Biology</td>
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</table>
|      | Competency may be demonstrated by: 1) a course grade of 'A' or 'B' in AP Biology; 2) a score of 3 or better in the national AP exam; 3) a successful score on the CLEP exam; 4) a passing grade for General Biology (BIOL 100)

Total Hours 12-13

Advanced Professional Studies, BSE

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>*Clearances are valid for one year from the date that appears in the header of this degree audit in the field 'Clearance Date.' Clearances cannot expire in the middle of a semester.</td>
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<td></td>
<td>APS REQUIREMENTS</td>
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<td>ENGL 110</td>
<td>Intro to College Writing</td>
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<tr>
<td>ENGL 110H</td>
<td>Hnrs: Intro to College Writing</td>
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<tr>
<td>ENGL 230</td>
<td>Introduction to Literature</td>
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<tr>
<td>ENGL 231</td>
<td>World Literature 1</td>
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<tr>
<td>ENGL 232</td>
<td>World Literature 2</td>
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<tr>
<td>ENGL 233</td>
<td>Early British Literature</td>
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<tr>
<td>ENGL 234</td>
<td>Later British Literature</td>
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<tr>
<td>ENGL 235</td>
<td>American Literary Tradition I</td>
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<tr>
<td>ENGL 236</td>
<td>American Literary Tradition II</td>
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<tr>
<td>ENGL 241H</td>
<td>H: Explorations in World Lit</td>
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<tr>
<td>ENGL 242</td>
<td>Reading Our World:</td>
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<td>ENGL 292</td>
<td>Science Fiction</td>
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<td>ENGL 333</td>
<td>African-American Literature 1</td>
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<tr>
<td>ENGL 333H</td>
<td>Hnrs: African-American Lit 1</td>
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<td>ENGL 334</td>
<td>African American Literature 2</td>
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<tr>
<td>ENGL 334H</td>
<td>Hnrs: African-American Lit 2</td>
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<tr>
<td>ENGL 336</td>
<td>New Dimensions to World Lit</td>
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<tr>
<td>ENGL 338</td>
<td>Folklore and Literature</td>
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<tr>
<td>ENGL 401</td>
<td>Old Eng Lang and Literature</td>
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<tr>
<td>ENGL 402</td>
<td>Middle Eng Lang and Literature</td>
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### Mathematics
Two Mathematics courses are required for BSE students. You have taken 0 course(s). It is preferable to take two courses designated as G2. Click here to search for MATH courses on the current web schedule. BIOL 375 will fulfill one Mathematics course for BSE BIOL students.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDFN 211</td>
<td>Foundations Modern Education</td>
<td>6</td>
</tr>
<tr>
<td>&amp; EDFN 241</td>
<td>and Psychological Foundations of Teaching</td>
<td></td>
</tr>
</tbody>
</table>

48 earned (transcript) credit hours are required

### APS Registration Status
- You ARE NOT eligible to register for courses requiring APS status.

### ACT 126 - Educator Ethics Training
- You must submit your Educator Ethics Training.

### Pre-Service Testing Required
Pre-Service Testing Status is indicated by one of the following: 1.) PSTA - Pre-Service Testing Accomplished: Verified passing pre-service test scores meet the requirement. 2.) PSTI - Pre-Service Testing Incomplete: Non-passing pre-service test scores were submitted prior to the August 1, 2015 policy change. Passing scores must still be achieved in order to meet the PA certification requirements. 3.) PSTU - Pre-Service Testing Unverified: Unofficial copies of pre-service test scores were submitted. Official scores must be sent from the testing company in order to meet PA certification requirements. 4.) PSTX - Pre-Service Testing Waived: Per PDE - ACT 136, the Pre-Service Testing Requirement has been waived.

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### Your GPA is below 3.0 - please see an advisor
If you are given the 2.8 GPA Exception for graduation and you graduate with a GPA lower than 3.0, you must have higher certification test scores in order to meet PA state certification requirements.

### No dispositions-related holds
If the requirement above is checked as complete, then there are currently no dispositions-related holds on your APS Status. Registration for APS courses is permitted when all APS requirements have been met. If it is incomplete, you have a hold and APS registration will not be allowed.

### Full Admission to APS
When all requirements are met, you must submit application for admission to APS status. Click here for the application.

### Total Hours
12