Mathematics Education (BS) and Mathematics (BS) (Double Major)

The double degree in Mathematics Education (BS) and Mathematics (BS) is one of two double degree options in the Mathematics Education program in the Department of STEM Education.

This degree program prepares teacher-leaders to have a deep understanding of the mathematics they will teach and knowledge about different pedagogical strategies they can apply in the classroom. Students take five courses focused on mathematics education, beginning in their sophomore year. Our professional courses in the junior and senior year offer relevant pedagogical experiences, emphasize teaching mathematics with technology, and provide rich field experiences in math classrooms. Graduates are recommended for an initial North Carolina teaching license in mathematics grades 9-12. They will be able to seek employment opportunities in education and make a positive difference in their communities.

In addition, students earn a degree in Mathematics. Upper level mathematics electives help prepare students for a variety of math-related fields in addition to teaching at the secondary level and graduate study in mathematics or related fields.

Students in this program also have the opportunity to participate in:

- Undergraduate research
- Kappa student chapter of the NC Council of Teachers of Mathematics, and other high impact experiences such as Passport to Success, SAY Village, and study abroad
- Tutoring in local schools

For more information about this program, visit our website (https://ced.ncsu.edu/programs/mathematics-education-middle-school-or-secondary-bachelor/).

Program Coordinator:
Dr. Cyndi Edgington
Email: cpedging@ncsu.edu
502J Poe Hall
919-515-1754

Plan Requirements

Mathematics Education (BS) and Mathematics (BS) (Dual Degree):
129 Total Units

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Foreign Language Proficiency ([http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-foreign-language-proficiency/](http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-foreign-language-proficiency/)) (verify requirement)

Total Hours 129

1 A grade of C or higher is required.
2 A grade of C- or higher is required.
3 A grade of B- or higher is required.

### Basic Science Electives

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<tr>
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<tr>
<td>BIO 181</td>
<td>Introductory Biology: Ecology, Evolution, and Biodiversity</td>
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<tr>
<td>BIO 183</td>
<td>Introductory Biology: Cellular and Molecular Biology</td>
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<td>Chemistry - A Quantitative Science and Quantitative Chemistry Laboratory</td>
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<td>PY 202</td>
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<td>PY 208 &amp; PY 209</td>
<td>Physics for Engineers and Scientists II</td>
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### Math Electives

#### Math Electives <400

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<tr>
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<td>MA 325</td>
<td>Introduction to Applied Mathematics</td>
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<tr>
<td>MA 335</td>
<td>Symbolic Logic</td>
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<td>MA 341</td>
<td>Applied Differential Equations I</td>
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<tr>
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#### Math Electives >400

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<td>BMA 574</td>
<td>Mathematical Modeling of Physical and Biological Processes II</td>
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<td>CSC 416</td>
<td>Introduction to Combinatorics</td>
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<td>CSC 427</td>
<td>Introduction to Numerical Analysis I</td>
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<tr>
<td>CSC 428</td>
<td>Introduction to Numerical Analysis II</td>
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<td>Graph Theory</td>
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<td>Numerical Analysis I</td>
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<td>CSC 583</td>
<td>Introduction to Parallel Computing</td>
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<td>E 531</td>
<td>Dynamic Systems and Multivariable Control I</td>
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<td>ECG 528</td>
<td>Options and Derivatives Pricing</td>
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<td>FIM 528</td>
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<td>Financial Risk Analysis</td>
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<td>ISE 505</td>
<td>Linear Programming</td>
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<td>Applied Differential Equations II</td>
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<td>MA 402</td>
<td>Mathematics of Scientific Computing</td>
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<tr>
<td>MA 405</td>
<td>Introduction to Linear Algebra</td>
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<td>MA 407</td>
<td>Introduction to Modern Algebra for Mathematics Majors</td>
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<td>Foundations of Euclidean Geometry</td>
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<td>Long-Term Actuarial Models</td>
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<td>MA 421</td>
<td>Introduction to Probability</td>
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<td>MA 426</td>
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<td>MA 430</td>
<td>Mathematical Models in the Physical Sciences</td>
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<td>MA 432</td>
<td>Mathematical Models in Life and Social Sciences</td>
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<td>MA 437</td>
<td>Applications of Algebra</td>
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<td>Game Theory</td>
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<td>Problem Solving Strategies for Competitions</td>
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<td>Methods of Applied Mathematics I</td>
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<td>MA 491</td>
<td>Reading in Honors Mathematics</td>
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<td>Special Topics in Mathematics</td>
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<td>Advanced Mathematics for Engineers and Scientists I</td>
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<td>MA 512</td>
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<td>Geometry of Curves and Surfaces</td>
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<td>Algebraic Geometry</td>
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<td>MA 531</td>
<td>Dynamic Systems and Multivariable Control I</td>
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<td>Ordinary Differential Equations I</td>
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<td>Nonlinear Dynamics and Chaos</td>
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<td>Computer Experiments In Mathematical Probability</td>
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<td>MA 546</td>
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Major Field of Study Requirements

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<td>Introduction to Topology</td>
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<td>MA 555</td>
<td>Introduction to Manifold Theory</td>
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<tr>
<td>MA 561</td>
<td>Set Theory and Foundations Of Mathematics</td>
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<td>MA 565</td>
<td>Graph Theory</td>
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<td>OR 531</td>
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<td>OR 565</td>
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Mathematics Education (BS) and Mathematics (BS) (Double Major)

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<td>Choose four of the following:</td>
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<tr>
<td>MA 325</td>
<td>Introduction to Applied Mathematics</td>
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<tr>
<td>MA 335/LOG 355</td>
<td>Symbolic Logic</td>
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<tr>
<td>MA 341</td>
<td>Applied Differential Equations I</td>
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<tr>
<td>MA 351</td>
<td>Introduction to Discrete Mathematical Models</td>
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<tr>
<td>MA 400+ (except for MA 403, MA 433, MA 507, MA 508, MA 509, MA 510, MA 511). A sequence of two 3-hour courses in an area of advanced mathematics is required.</td>
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<tr>
<td>MA 116</td>
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<td>Introduction to Computing-FORTRAN</td>
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<td>CSC 114</td>
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<td>CSC 116</td>
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<td>Chemistry - A Molecular Science and General Chemistry Laboratory</td>
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<td>&amp; CH 102</td>
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<td>PY 205</td>
<td>Physics for Engineers and Scientists I</td>
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<td>&amp; PY 206</td>
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<td>&amp; 209</td>
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<td>Communication:</td>
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<td>Interpersonal Communication</td>
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<tr>
<td>EMS 204</td>
<td>Introduction to Mathematics Education</td>
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<tr>
<td>ED 204</td>
<td>Introduction to Teaching in Today's Schools</td>
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<td>ECI 305</td>
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<tr>
<td>EMS 480</td>
<td>Teaching Mathematics with Technology</td>
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<tr>
<td>ED 311</td>
<td>Classroom Assessment Principles and Practices</td>
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<tr>
<td>EMS 472</td>
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<td>EMS 470</td>
<td>Methods and Materials for Teaching Mathematics</td>
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<td>EMS 490</td>
<td>School Mathematics from an Advanced Perspective</td>
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<td>EMS 495</td>
<td>Senior Seminar in Mathematics and Science Education</td>
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<tr>
<td>ECI 416</td>
<td>Teaching Exceptional Students in the Mainstreamed Classroom</td>
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Semester Sequence

This is a sample.
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<td><strong>Fall Semester</strong></td>
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<tr>
<td>MA 141</td>
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<td>General Chemistry Laboratory[^5]</td>
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<td>ENG 101</td>
<td>Academic Writing and Research[^H]</td>
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<td>Introduction to Computing Environments[^1]</td>
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<td>ED 100</td>
<td>Intro to Education[^9]</td>
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<td>Calculus II[^4]</td>
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<td>Physics for Engineers and Scientists I[^B, 2, 5]</td>
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<tr>
<td>PY 206</td>
<td>Physics for Engineers and Scientists I Laboratory[^B, 2, 5]</td>
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<tr>
<td>Introduction to Programming[^3, 6]</td>
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<tr>
<td>GEP Health and Exercise Studies ([<a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/</a>][^E])</td>
<td>1</td>
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<tr>
<td>COM 112</td>
<td>Interpersonal Communication[^D]</td>
<td>3</td>
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<tr>
<td><strong>Second Year</strong></td>
<td></td>
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<tr>
<td><strong>Fall Semester</strong></td>
<td></td>
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<tr>
<td>MA 242</td>
<td>Calculus III[^4]</td>
<td>4</td>
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<tr>
<td>PY 208 or PY 202</td>
<td>Physics for Engineers and Scientists II[^B, 2, 5]</td>
<td>4</td>
</tr>
<tr>
<td>GEP Interdisciplinary Perspectives ([<a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-interdisciplinary-perspectives/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-interdisciplinary-perspectives/</a>][^G, I, J])</td>
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<td>GEP Humanities ([<a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/</a>][^C, I, J])</td>
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<tr>
<td><strong>Spring Semester</strong></td>
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<tr>
<td>MA 341 or MA 351</td>
<td>Applied Differential Equations[^4]</td>
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<tr>
<td>MA 405</td>
<td>Introduction to Linear Algebra[^6]</td>
<td>3</td>
</tr>
<tr>
<td>GEP Health and Exercise Studies ([<a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/</a>][^E])</td>
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<td>EMS 204</td>
<td>Introduction to Mathematics Education[^9]</td>
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<tr>
<td>ED 204</td>
<td>Introduction to Teaching in Today's Schools[^9]</td>
<td>2</td>
</tr>
<tr>
<td>GEP Additional Breadth ([<a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/</a>][^F, I, J]) (Humanities/Social Sciences/Visual and Performing Arts)</td>
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<tr>
<td>EDP 304</td>
<td>Educational Psychology[^9, D]</td>
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<td><strong>Third Year</strong></td>
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<tr>
<td><strong>Fall Semester</strong></td>
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<tr>
<td>ELP 344</td>
<td>School and Society[^9]</td>
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<tr>
<td>ED 312</td>
<td>Classroom Assessment Principles and Practices Professional Learning Lab[^9]</td>
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<tr>
<td>ST Elective[^6]</td>
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<td>ECI 305</td>
<td>Equity and Education[^7, G]</td>
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<td><strong>Spring Semester</strong></td>
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<tr>
<td>MA 425</td>
<td>Mathematical Analysis I[^6]</td>
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<td>Math Elective[^4, 6, 7]</td>
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<td>Math Elective[^4, 6, 7]</td>
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<tr>
<td>EMS 472</td>
<td>Teaching Mathematics Topics in Senior High School[^9]</td>
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<tr>
<td>EMS 480</td>
<td>Teaching Mathematics with Technology[^9]</td>
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<tr>
<td>MA 421</td>
<td>Introduction to Probability[^6, 8]</td>
<td>3</td>
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<tr>
<td><strong>Fourth Year</strong></td>
<td></td>
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<tr>
<td><strong>Fall Semester</strong></td>
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<tr>
<td>MA 426 or MA 512 OR OTHER MA ELECTIVE</td>
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<tr>
<td>Math Elective[^4, 6, 7]</td>
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<tr>
<td>EMS 490</td>
<td>School Mathematics from an Advanced Perspective[^9]</td>
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<td>ECI 416</td>
<td>Teaching Exceptional Students in the Mainstreamed Classroom[^9]</td>
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<tr>
<td>EMS 470</td>
<td>Methods and Materials for Teaching Mathematics[^1]</td>
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<tr>
<td><strong>Spring Semester</strong></td>
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<tr>
<td>EMS 471</td>
<td>Student Teaching in Mathematics[^9]</td>
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<tr>
<td>EMS 495</td>
<td>Senior Seminar in Mathematics and Science Education[^9]</td>
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<tr>
<td><strong>Total Hours</strong></td>
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<td>130</td>
</tr>
</tbody>
</table>

**Major/Program Footnotes:**

1. COS 100 may substitute for E 115.
2. An alternative to PY 205 and PY 208 is PY 201 and PY 202.
3. Introduction to programming course must be selected from MA 116, CSC 112, CSC 114, or CSC 116.
4. A grade below C is not permitted in MA 141, 241, 242, 225, 341 or 351.
5. At most one grade below a C- is permitted in courses satisfying the science requirement.
At most one grade below a C is permitted in required mathematics courses >400, elective math courses, statistics, and computer science courses.

Math electives must be chosen from the following: MA 325, MA/LOG 335, MA 341, MA 351, MA 400+ (except MA 403, MA 433, MA 507, MA 508, MA 509, MA 510, MA 511). A sequence of two 3-hour courses in an area of advanced mathematics is required.

Statistics elective must be chosen from the following: ST 370, ST 372, ST 421, or ST 422. The preferred statistics sequence is ST 370 with MA 421. Alternatives include ST 371 with ST 372, or ST 421 with ST 422. If ST 370 is taken, MA 421 will be an advanced mathematics elective. If ST 371/372 is taken, ST 371 will be a free elective. If ST 421/422 is taken, ST 421 will be a free elective.

A grade below a B- is not permitted in EMS 204. A grade below a C is not permitted in all other EMS, EDP, ECI, ELP, ED courses.

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**General Education Program (GEP) requirements and GEP Footnotes:**

To complete the requirements for graduation and the General Education Program, the following category credit hours and co-requisites must be satisfied. University approved GEP course lists for each of the following categories can be found at [http://www.ncsu.edu/uap/academic-standards/gep/courselists/index.html](http://www.ncsu.edu/uap/academic-standards/gep/courselists/index.html).

A  **Mathematical Sciences** (6 credit hours – one course with MA or ST prefix)
   
   Choose from the University approved GEP Mathematical Sciences course list or the following course(s) if completed as part of the Major requirements may fulfill part or all of this requirement: MA 141, MA 241

B  **Natural Sciences** (7 credit hours – include one laboratory course or course with a lab)
   
   Choose from the University approved GEP Natural Sciences course list or the following course(s) if completed as part of the Major requirements may fulfill part or all of this requirement: BIO 181, BIO 183, CH 101, CH 102, PY 201 and PY 202, or PY 205 and PY 208

C  **Humanities** (6 credit hours selected from two different disciplines/course prefixes)
   
   Choose from the University approved GEP Humanities course list.

D  **Social Sciences** (6 credit hours selected from two different disciplines/course prefixes)
   
   Choose from the University approved GEP Social Sciences course list or the following course(s) if completed as part of the Major requirements may fulfill part or all of this requirement: ED 304, COM 112

E  **Physical Education/Healthy Living** (2 credit hours – at least one 100-level Fitness and Wellness Course)
   
   Choose from the University approved GEP Physical Education/Healthy Living course list.

F  **Additional Breadth** - (3 credit hours to be selected from the following checked University approved GEP course lists) Humanities/Social Sciences/Visual and Performing Arts or Mathematical Sciences/Natural Sciences/Engineering

G  **Interdisciplinary Perspectives** (5-6 credit hours)
   
   Major/College course requirements satisfies 3 credit hours of this requirement. Remaining hours must be chosen from the University Approved GEP course list for the category: ECI 305

H  **Introduction to Writing** (4 credit hours satisfied by completing ENG 101 with a C- or better)

I  **U.S. Diversity** (USD)
   
   Choose from the University approved GEP U.S. Diversity course list or choose a course identified on the approved GEP course lists as meeting the U.S. Diversity (USD) co-requisite.

J  **Global Knowledge** (GK)
   
   Choose from the University approved GEP Global Knowledge course list or choose a course identified on the approved GEP course lists as meeting the Global Knowledge (GK) co-requisite.

K  **Foreign Language proficiency** - Proficiency at the FL_102 level is required for graduation.