Secondary STEM Education

NOTE: Detailed information about the new major in STEM Education will be available shortly.

UK Core Requirements
See the UK Core section of this Bulletin for the complete UK Core requirements. The courses listed below are (a) recommended by the college, or (b) required courses that also fulfill UK Core areas. Students should work closely with their advisor to complete the UK Core requirements.

UK Core courses may overlap with content major requirements. May not overlap with content support courses.

I. Intellectual Inquiry in Arts and Creativity
Choose one course from approved list ........................................... 3

II. Intellectual Inquiry in the Humanities
Choose one course from approved list ........................................... 3

III. Intellectual Inquiry in the Social Sciences
Choose one course from approved list ........................................... 3

IV. Intellectual Inquiry in the Natural, Physical, and Mathematical Sciences
Choose one course from approved list ........................................... 3

V. Composition and Communication I
CIS/WRD 110 Composition and Communication I ............................ 3

VI. Composition and Communication II
CIS/WRD 111 Composition and Communication II ............................ 3

VII. Quantitative Foundations
MA 113 Calculus I
or
MA 137 Calculus I with Life Science Applications ............................ 4

VIII. Statistical Inferential Reasoning
STA 210 Making Sense of Uncertainty: An Introduction to Statistical Reasoning ........................................... 3

IX. Community, Culture and Citizenship in the USA
Choose one course from approved list ........................................... 3

X. Global Dynamics
Choose one course from approved list ........................................... 3

UK Core Hours .............................................................................. 31

Required STEM Education Major Core

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEM 110 Introduction to STEM Education</td>
<td>2</td>
</tr>
<tr>
<td>EDP 202 Human Development and Learning</td>
<td>3</td>
</tr>
<tr>
<td>MA 113 Calculus I</td>
<td></td>
</tr>
<tr>
<td>MA 137 Calculus I with Life Science Applications</td>
<td>4</td>
</tr>
</tbody>
</table>

STEM Education Primary Major

<table>
<thead>
<tr>
<th>Major Requirements</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDS 516 Principles of Behavior Management and Instruction</td>
<td>3</td>
</tr>
<tr>
<td>SEM 421 STEM Methods I</td>
<td>3</td>
</tr>
<tr>
<td>SEM 422 STEM Methods II</td>
<td>3</td>
</tr>
<tr>
<td>SEM 435 STEM Student Teaching in the Secondary School</td>
<td>10</td>
</tr>
<tr>
<td>EPE 301 Education in American Culture</td>
<td>3</td>
</tr>
</tbody>
</table>

*Requires field experience hours.

Primary Major Hours ...................................................................... 22

plus one or more of the following areas:

Mathematics Secondary Major

<table>
<thead>
<tr>
<th>Mathematics Core Courses</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>**MA 113 Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>MA 114 Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>MA 213 Calculus III</td>
<td>4</td>
</tr>
<tr>
<td>MA 261 Introduction to Number Theory</td>
<td>3</td>
</tr>
<tr>
<td>MA 322 Matrix Algebra and Its Applications</td>
<td>3</td>
</tr>
</tbody>
</table>

Mathematics Sequence
Choose one. May substitute a different sequence with prior faculty approval.

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA 361 Elementary Modern Algebra I</td>
<td>3</td>
</tr>
<tr>
<td>MA 362 Elementary Modern Algebra II</td>
<td>6</td>
</tr>
<tr>
<td>MA 416G Principles of Operations Research</td>
<td>6</td>
</tr>
<tr>
<td>MA 417G Principles of Operations Research II</td>
<td>6</td>
</tr>
</tbody>
</table>

Required Mathematics Electives

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA 310 Mathematical Problem Solving for Teachers</td>
<td>3</td>
</tr>
<tr>
<td>MA/STA 320 Introductory Probability</td>
<td>3</td>
</tr>
<tr>
<td>MA 330 History of Mathematics</td>
<td>3</td>
</tr>
<tr>
<td>MA 341 Topics in Geometry</td>
<td>3</td>
</tr>
</tbody>
</table>

Optional Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA 214 Calculus IV</td>
<td>3</td>
</tr>
</tbody>
</table>

Mathematics Secondary Major Hours ...................................................................... 36

**Eligible to meet a UK Core requirement.
Physics Secondary Major

**CHE 105 General College Chemistry I .................................................. 4
**CHE 107 General College Chemistry II.................................................. 3
PHY 231 General University Physics ..................................................... 4
PHY 232 General University Physics ..................................................... 4
PHY 228 Optics, Relativity, and Thermal Physics ............................ 3
PHY 306 Theoretical Methods of Physics ........................................... 3
PHY 335 Data Analysis for Physicists ................................................. 1
PHY 401G Special Topics in Physics and Astronomy for Elementary, Middle School, and High School Teachers .................................................. 3
PHY 460 Active Learning Laboratory for Secondary Majors (proposed course) ............................................................................... 4

AST 310 Topics in Astronomy and Astrophysics (Subtitle required) ... 3
**MA 113 Calculus I ................................................................................. 4
MA 114 Calculus II ................................................................................... 4
MA 213 Calculus III .................................................................................. 4

Physics Secondary Major Hours ............................................................ 49

**Eligible to meet a UK Core requirement.

STEM Content Support Courses

Take up to 120 hours required for graduation. Select from each area of interest. You may not double count these courses with your major content course requirements or General Education requirements. Students should take courses in the STEM areas outside of their content/certification area. This list is not inclusive. All courses should be approved by advisor before taking.

Mathematics/Statistics

STA 291 Statistical Methods ................................................................... 3
MA 501/502 Seminar in Selected Topics ................................................ 3
OR/STA 524 Probability ........................................................................ 3
EDC/EDP/EPE 522 Educational Tests
and Measurements ................................................................................ 3
SEM 525 Mathematics Clinic (proposed course) ................................... 3

Engineering

EGR XXX SysSTEM .............................................................................. 3
EGR 101 Introduction to Engineering .................................................... 4
EGR 199 Topics in Engineering: Title to Be Assigned ....................... 3
EGR 199 Topics in Engineering: Title to Be Assigned ....................... 3

Technology

CS 115 Introduction to Computer Programming .................................. 3
MAS 201 Communication Technologies and Society ....................... 3
INF 401G Informatics Fundamentals ................................................... 3
EDC 543 Digital Game Based Learning and Instruction ..................... 3
EDC 544 Use and Integration of Instructional Media ......................... 3
CS 215 Introduction to Program Design,
Abstraction, and Problem Solving .................................................... 4
CS 221 First Course in Computer Science for Engineers .................. 2
CS 316 Web Programming .................................................................. 3

Science

CHE 105 General College Chemistry I ................................................. 3
CHE 111 Laboratory to Accompany General Chemistry I .................. 1
BIO 148 Introductory Biology I ............................................................. 3
BIO 155 Laboratory for Introductory Biology I .................................... 1
PHY 231 General University Physics .................................................... 4
PHY 241 General University Physics Laboratory ............................... 1
GLY/EES 220 Principles of Physical Geology ...................................... 4

Minimum 120 credit hours required for graduation and Rank III certification.

Total Credit Hours .................................................................................. 120