Mathematics, Minor
(SCIENCE)

Requirements for a minor may be completed at any campus location offering the specified courses for the minor. Students may not change from a campus that offers their major to a campus that does not offer their major for the purpose of completing a minor.

Program Description
The minor is designed to provide students with an interest in mathematics an opportunity to study a broad range of mathematical topics. The requirements allow students a great deal of flexibility in choosing courses of interest.

What is Mathematics?
The study of mathematics emphasizes careful problem analysis, precision of thought and expression, and the development of mathematical skills needed for work in many other areas. Theoretical mathematicians increase basic knowledge in "pure" fields like abstract algebra, analysis, or topology. Applied mathematicians use tools growing out of calculus, analysis, computing, statistics, and operations research to solve problems in science, industry, government, and other areas.

You Might Like This Program If...
• You like mathematics, like to think, like a challenge, and like to know why things are true.
• You want to develop strong problem-solving skills, comprehension of abstract concepts, and creative thinking ability.

Program Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Requirements for the Minor</td>
<td>26-28</td>
</tr>
</tbody>
</table>

Requirements for the Minor
A grade of C or better is required for all courses in the minor, as specified by Senate Policy 59-10 (http://senate.psu.edu/policies-and-rules-for-undergraduate-students/59-00-minors-and-certificates/#59-10).

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
</table>
| Prescribed Courses: Require a grade of C or better
MATH 140 | Calculus With Analytic Geometry I | 4       |
| MATH 141 | Calculus with Analytic Geometry II | 4       |

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
</table>
| Additional Courses: Require a grade of C or better
Select 6-8 credits of the following: | 6-8     |

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 220</td>
<td>Matrices</td>
</tr>
<tr>
<td>MATH 230</td>
<td>Calculus and Vector Analysis</td>
</tr>
<tr>
<td>MATH 231</td>
<td>Calculus of Several Variables</td>
</tr>
<tr>
<td>MATH 232</td>
<td>Integral Vector Calculus</td>
</tr>
<tr>
<td>MATH 250</td>
<td>Ordinary Differential Equations</td>
</tr>
<tr>
<td>MATH 251</td>
<td>Ordinary and Partial Differential Equations</td>
</tr>
<tr>
<td>MATH 310</td>
<td>Elementary Combinatorics</td>
</tr>
<tr>
<td>MATH 311W</td>
<td>Concepts of Discrete Mathematics</td>
</tr>
<tr>
<td>MATH 312</td>
<td>Concepts of Real Analysis</td>
</tr>
</tbody>
</table>

Supporting Courses and Related Areas
Supporting Courses and Related Areas: Require a grade of C or better
Select 12 credits of 400-level MATH courses

Academic Advising
The objectives of the university’s academic advising program are to help advisees identify and achieve their academic goals, to promote their intellectual discovery, and to encourage students to take advantage of both in-and out-of class educational opportunities in order that they become self-directed learners and decision makers.

Both advisers and advisees share responsibility for making the advising relationship succeed. By encouraging their advisees to become engaged in their education, to meet their educational goals, and to develop the habit of learning, advisers assume a significant educational role. The advisee’s unit of enrollment will provide each advisee with a primary academic adviser, the information needed to plan the chosen program of study, and referrals to other specialized resources.

READ SENATE POLICY 32-00: ADVISING POLICY (http://senate.psu.edu/policies-and-rules-for-undergraduate-students/32-00-advising-policy/)

University Park
Undergraduate Mathematics Office
Academic Advising
104 McAllister Building
University Park, PA 16802
814-865-7528
undergrad@math.psu.edu

Altoona
Michael D. Weiner
Associate Professor of Mathematics
Hawthorn Building 115
3000 Ivyside Park
Altoona, PA 16601
814-949-5558
mdw8@psu.edu

Harrisburg
Thang Bui, Ph.D.
Program Chair
Olmsted Building, W255a
Middletown, PA 17057
717-948-6088
flv@psu.edu

Contact
University Park
DEPARTMENT OF MATHEMATICS
104 McAllister Building
University Park, PA 16802
814-865-7528
undergrad@math.psu.edu
http://math.psu.edu/

Altoona
DIVISION OF MATHEMATICS AND NATURAL SCIENCES
Hawthorn Building 115
Mathematics, Minor (Science)

3000 Ivyside Park
Altoona, PA 16601
814-949-5558
mdw8@psu.edu

http://altoona.psu.edu/academics/bachelors-degrees/mathematics/
request-information (http://altoona.psu.edu/academics/bachelors-degrees/mathematics/request-information/)

Harrisburg
SCHOOL OF SCIENCE, ENGINEERING, AND TECHNOLOGY
Olmsted Building, W255
Middletown, PA 17057
717-948-6081
jmb84@psu.edu

http://harrisburg.psu.edu/science-engineering-technology/