A.S. in Liberal Arts and Sciences (Mathematics and Sciences)  
Physics Concentration – Catalog Year 2019-20

Two and a Half Year Degree Pathway for Students Starting in MA-441

The A.S. degree in Liberal Arts and Sciences (Mathematics and Sciences) is intended for students who plan to transfer to a 4-year college and university and pursue a bachelor’s degree in a field of science or mathematics. This degree plan is designed for students plan to pursue physics after transfer. Other degree plans are available for students who plan to pursue biology, computer science, mathematics, or physics. This Degree Pathway is also designed for students who place into MA-441. Additional Degree Pathways are available for students who place into other levels of mathematics. Please see the degree website or your advisor for more information.

Courses in **Bold Text** are prerequisites for later courses or only offered in the Fall or Spring semester and should be taken where indicated in the sequence.

### Fall Semester #1

<table>
<thead>
<tr>
<th>Courses</th>
<th>Credits</th>
<th>Prerequisites and Corequisites</th>
</tr>
</thead>
</table>
| ENGL-101 English Composition I  
(Required Core 1A: English Composition) | 3 | Prerequisite: BE-112/205 and 122/226, placement, or exemption |
| MA-441 Analytic Geometry and Calculus I² (Required for Major)  
(Required Core 1B - Mathematical & Quantitative Reasoning) | 4 | Prerequisite: MA-440 (C or better) |
| Required Core 1C – Life & Physical Sciences  
PH-421 General Calculus Physics A | 5 | Corequisite: MA-441 |
| SP-211 Speech Communication²,³  
(Flexible Core 2B: U.S. Experience & Its Diversity) | 3 | None |
| **Total credits for the term** | **15** | |

### Spring Semester #1

<table>
<thead>
<tr>
<th>Courses</th>
<th>Credits</th>
<th>Prerequisites and Corequisites</th>
</tr>
</thead>
</table>
| ENGL-102 English Composition II  
(Required Core 1A: English Composition) | 3 | Prerequisite: ENGL-101 or placement |
| Flexible Core 2E³ – Scientific World  
Recommended: MA-442 Analytic Geometry and Calculus II | 4 | Prerequisite: MA-441 (C or better) |
| Additional Flexible Core Course³ | 5 | Prerequisites: MA-441 and PH-421 (C or better); Corequisite: MA-442 |

A.S. in Liberal Arts and Sciences (Math and Science) – Physics Concentration – Last updated: 10/15/19
### Courses

<table>
<thead>
<tr>
<th>Courses</th>
<th>Credits</th>
<th>Prerequisites and Corequisites¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recommended: <strong>PH-422 General Calculus Physics B</strong></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>One course from Flexible Core 2A, 2C, or 2D³</td>
<td>3</td>
<td>Check individual courses for prerequisites and corequisites</td>
</tr>
<tr>
<td>(Recommended: History or Social Sciences course from 2A or 2D)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total credits for the term</strong></td>
<td><strong>15</strong></td>
<td></td>
</tr>
</tbody>
</table>

#### Fall Semester #2

<table>
<thead>
<tr>
<th>Courses</th>
<th>Credits</th>
<th>Prerequisites and Corequisites¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major Elective Courses⁴ - Take one course from the list below</td>
<td>4</td>
<td>Prerequisite: PH-422</td>
</tr>
<tr>
<td>Recommended: PH-440 Modern Physics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Major Elective Courses⁴ - Take one course from the list below</td>
<td>4</td>
<td>Prerequisite: MA-442 (C or better)</td>
</tr>
<tr>
<td>Recommended: <strong>MA-443 Analytic Geometry and Calculus III</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Two courses from Flexible Core 2A, 2C, or 2D³</td>
<td>6</td>
<td>Check individual courses for prerequisites and corequisites</td>
</tr>
<tr>
<td>One credit course in PE-100, PE-500, or DAN100 series</td>
<td>1</td>
<td>Check individual courses for prerequisites and corequisites</td>
</tr>
<tr>
<td><strong>Total credits for the term</strong></td>
<td><strong>15</strong></td>
<td></td>
</tr>
</tbody>
</table>

#### Spring Semester #2

<table>
<thead>
<tr>
<th>Courses</th>
<th>Credits</th>
<th>Prerequisites and Corequisites¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major Elective Courses⁵ - Take one course from the list below</td>
<td>4</td>
<td>Prerequisite: MA-443</td>
</tr>
<tr>
<td>Recommended: <strong>MA-451 Differential Equations</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Major Elective Courses⁵ - Take one course from the list below</td>
<td>4</td>
<td>Prerequisite: MA-442 (C or better)</td>
</tr>
<tr>
<td>Recommended: MA-461 Linear Algebra</td>
<td></td>
<td></td>
</tr>
<tr>
<td>History or Social Science Course (Required for Major)</td>
<td>3</td>
<td>Check individual courses for prerequisites and corequisites</td>
</tr>
<tr>
<td>(If taken in the Common Core, select another Major Elective from list below)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Major Elective Courses⁵ - Take one course from the list below</td>
<td>2-3</td>
<td>Check individual courses for prerequisites and corequisites</td>
</tr>
<tr>
<td>HE-101 Introduction to Health Education or HE-102 Health, Behavior and Society</td>
<td>1-2</td>
<td>Prerequisite for HE-101: None</td>
</tr>
<tr>
<td>Corequisite for HE-102: BE-122/226 or placement</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total credits for the term</strong></td>
<td><strong>15</strong></td>
<td></td>
</tr>
</tbody>
</table>

### Notes:

1. Prerequisites for a course must be passed before taking the course. Corequisites must be passed before taking the course or taken in the same term as the course.
2. Students are required to take particular courses in some areas of the Common Core that fulfill both general education and major requirements. If students do not take the required courses in the Common Core, they will have to take additional credits to complete their degree requirements.

3. Students must complete one course from each of the Flexible Core categories (2A, 2B, 2C, 2D, and 2E) and one additional course from any one of the categories. SP-211 will satisfy area 2B. The course for area 2E and the one additional flexible core course must be selected from the courses in the list below marked with an asterisk (*)

4. Students must take 9-18 credits of major elective courses to reach 60 credits. See the list below for approved major elective courses. Students must complete two-course sequences in at least two different subject areas (biology, chemistry, computer science, mathematics, and physics).

All students must complete two (2) WI designated classes to fulfill degree requirements
**Major Elective Courses**

<table>
<thead>
<tr>
<th>Major Elective Courses</th>
<th>Credits</th>
<th>Prerequisites and Corequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>BI-201 General Biology I*</td>
<td>4</td>
<td>BE-112/205 and 122/226 or placement</td>
</tr>
<tr>
<td>BI-202 General Biology II*</td>
<td>4</td>
<td>BI-201</td>
</tr>
<tr>
<td>BI-356 Principles of Genetics</td>
<td>4</td>
<td>BI-201 (C or better)</td>
</tr>
<tr>
<td>BI-357 Bioinformatics/Computational Biology</td>
<td>3</td>
<td>BI-201 (C or better)</td>
</tr>
<tr>
<td>BI-453 Biotechnology</td>
<td>5</td>
<td>BI201 and permission of instructor</td>
</tr>
<tr>
<td>CH-151 General Chemistry I*</td>
<td>4.5</td>
<td>MA-119 and MA-121 or placement</td>
</tr>
<tr>
<td>CH-152 General Chemistry II*</td>
<td>4.5</td>
<td>Prerequisite: CH-151</td>
</tr>
<tr>
<td>CH-251 Organic Chemistry I*</td>
<td>5</td>
<td>Corequisite: CH-152 or permission of the department</td>
</tr>
<tr>
<td>CH-252 Organic Chemistry II*</td>
<td>5</td>
<td>Prerequisite: CH-251</td>
</tr>
<tr>
<td>CS-101 Algorithmic Problem Solving I*</td>
<td>4</td>
<td>Corequisite: MA-441</td>
</tr>
<tr>
<td>CS-201 Computer Organization and Assembly Language*</td>
<td>4</td>
<td>Prerequisites: CS-101 (C or better) and MA-441</td>
</tr>
<tr>
<td>CS-203 Algorithmic Problem Solving II in C++*</td>
<td>4</td>
<td>Prerequisites: CS-101 (C or better) and MA-441</td>
</tr>
<tr>
<td>CS-220 Discrete Structures</td>
<td>3</td>
<td>Prerequisite: MA-471</td>
</tr>
<tr>
<td>MA-442 Analytic Geometry and Calculus II*</td>
<td>4</td>
<td>Prerequisite: MA-441 (C or better)</td>
</tr>
<tr>
<td>MA-443 Analytic Geometry and Calculus III*</td>
<td>4</td>
<td>Prerequisite: MA-442 (C or better)</td>
</tr>
<tr>
<td>MA-451 Differential Equations*</td>
<td>4</td>
<td>Prerequisite: MA-443 (C or better)</td>
</tr>
<tr>
<td>MA-461 Linear Algebra*</td>
<td>4</td>
<td>Prerequisite: MA-442 (C or better)</td>
</tr>
<tr>
<td>MA-471 Introduction to Discrete Mathematics</td>
<td>3</td>
<td>Prerequisite: MA-440</td>
</tr>
<tr>
<td>MA-481 Probability and Statistics</td>
<td>3</td>
<td>Corequisite: MA-442</td>
</tr>
<tr>
<td>PH-301 College Physics I*</td>
<td>4</td>
<td>Prerequisite: MA-114 OR MA-119 and MA-121</td>
</tr>
<tr>
<td>PH-302 College Physics II*</td>
<td>4</td>
<td>Prerequisite: PH-301 (C or better)</td>
</tr>
<tr>
<td>PH-311 College Physics A*</td>
<td>4</td>
<td>Prerequisite: MA-441 or permission of Department</td>
</tr>
<tr>
<td>PH-312 College Physics B*</td>
<td>4</td>
<td>Pre/corequisite: PH-312</td>
</tr>
<tr>
<td>PH-421 General Calculus Physics A*</td>
<td>5</td>
<td>Corequisite: MA-441</td>
</tr>
<tr>
<td>PH-422 General Calculus Physics B*</td>
<td>5</td>
<td>Prerequisites: MA-441 and PH-421 (C or better); Corequisite: MA-442</td>
</tr>
<tr>
<td>PH-440 Modern Physics*</td>
<td>4</td>
<td>Prerequisite: PH-422</td>
</tr>
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Courses marked with an asterisk (*) can be used to satisfy the Flexible Core requirement.