

## Degree Pathway

### A.S. in Liberal Arts and Sciences (Mathematics and Sciences) – Catalog Year 2020-21 *Recommended Courses for Students Planning to Pursue a B.S. in Computer Science*

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 **computer science** after transfer. Other degree plans are available for students who plan to pursue biology, chemistry, mathematics, or physics. This Degree Pathway is also designed for students who place into **developmental math**. 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 and should be taken where indicated in the sequence (or earlier).

#### Fall Semester #1

| Courses   | Credits            | Prerequisites and Corequisites <sup>1</sup>  |
|---|--------------------|--|
| <b>ENGL-101 English Composition I (ALP section)</b><br>(Required Core 1A - English Composition) | 3                  | Pre/corequisite: Must satisfy developmental requirement in English or be co-enrolled in BE-102 |
| <b>ENGL-99 Developing Competence in College Reading, Writing, &amp; Study Skills</b>            | 0 (4 eq.)          | Corequisite: ENGL-101  |
| <b>MA-119 College Algebra</b><br>(Required Core 1B: Mathematical and Quantitative Reasoning)    | 3                  | Pre/corequisite: Must satisfy developmental requirement in math or be co-enrolled in MA-10 ALP |
| <b>MA-10 ALP Elementary Algebra</b>   | 0 (2 eq.)          | Corequisite: MA-119  |
| <b>MA-121 Trigonometry</b> (Required for major)   | 1                  | Corequisite: MA-119  |
| HE-101 Personal Health and Wellness or HE-102 Health, Behavior and Society                      | 1-2                | Prerequisite: None   |
| <b>Total credits for the term</b>   | <b>8-9 + 6 eq.</b> |  |

#### Spring Semester #1

| Courses   | Credits   | Prerequisites and Corequisites <sup>1</sup>                                   |
|---|-----------|---|
| <b>ENGL-102 English Composition II</b><br>(Required Core 1A: English Composition)   | 3         | Prerequisite: ENGL-101 or placement   |
| Flexible Core 2E – Scientific World <sup>4</sup><br><b>MA-440 Pre-Calculus Mathematics<sup>2</sup></b> (Required for major) | 4         | Prerequisite: MA-119 and MA-121 (C or better in both) or MA-114 (C or better) |
| One course from Flexible Core 2A, 2C, or 2D <sup>3</sup>  | 3         | Check individual courses for prerequisites and corequisites                   |
| One course from Flexible Core 2A, 2C, or 2D <sup>3</sup>  | 3         | Check individual courses for prerequisites and corequisites                   |
| One credit course in PE-400, PE-500, or DAN-100 series  | 1         | Check individual courses for prerequisites and corequisites                   |
| <b>Total credits for the term</b>   | <b>14</b> |   |

### Summer Session

| Courses  | Credits  | Prerequisites and Corequisites <sup>1</sup>                 |
|--|----------|---|
| SP-211 Speech Communication <sup>2</sup><br>(Flexible Core 2B: U.S. Experience & Its Diversity)                            | 3        | None  |
| One course from Flexible Core 2A, 2C, or 2D <sup>3</sup><br>(Recommended: History or Social Sciences course from 2A or 2D) | 3        | Check individual courses for prerequisites and corequisites |
| <b>Total credits for the session</b>   | <b>6</b> |   |

### Fall Semester #2

| Courses  | Credits      | Prerequisites and Corequisites <sup>1</sup>                 |
|--|--------------|---|
| Additional Flexible Core Course <sup>3</sup><br><b>MA-441 Analytic Geometry and Calculus I<sup>2</sup></b> (Required for major)              | 4            | Prerequisite: MA-440 (C or better)                          |
| Major Elective Courses <sup>4</sup> - Take one course from the list below<br>Recommended: <b>CS-101 Algorithmic Problem Solving I</b>        | 4            | Corequisite: MA-441   |
| Major Elective Courses <sup>4</sup> - Take one course from the list below<br>Recommended: <b>MA-471 Introduction to Discrete Mathematics</b> | 3            | Prerequisite: MA-440  |
| Required Core 1C – Life & Physical Sciences<br>Choose one course from <sup>2</sup> : BI-201, CH-151, PH-301, PH-311, or PH-421               | 4-5          | Check individual courses for prerequisites and corequisites |
| <b>Total credits for the term</b>  | <b>15-16</b> |   |

### Spring Semester #2

| Courses  | Credits      | Prerequisites and Corequisites <sup>1</sup>                                      |
|--|--------------|--|
| Major Elective Courses <sup>4</sup> - Take one course from the list below<br>Recommended: CS-201 Computer Organization and Assembly Language                     | 4            | Prerequisites: CS-101 (C or better) and MA-441                                   |
| Major Elective Courses <sup>4</sup> - Take one course from the list below<br>Recommended: CS-203 Algorithmic Problem Solving II in C++                           | 4            | Prerequisites: CS-101 (C or better) and MA-441                                   |
| Major Elective Courses <sup>4</sup> - Take one course from the list below<br>Recommended: MA-442 Analytic Geometry and Calculus II or CS-220 Discrete Structures | 3-4          | Prerequisite for MA-442: MA-441 (C or better)<br>Prerequisite for CS-220: MA-471 |
| Major Elective Courses <sup>4</sup> - Take one course from the list below  | 0-3          | Check individual courses for prerequisites and corequisites                      |
| History or Social Science Course (Required for Major)<br>(If taken in the Common Core, select another Major Elective from list below)                            | 3            | Check individual courses for prerequisites and corequisites                      |
| <b>Total credits for the term</b>  | <b>15-17</b> |  |
| <b>Total credits required for the degree</b>   | <b>60</b>    |  |

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. 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 (\*). The courses recommended for those areas in the plan above are appropriate for students planning to earn a bachelor's degree in computer science.
4. Students must take 8-15 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). The courses recommended as major electives in the plan above are appropriate for students planning to earn a bachelor's degree in computer science.

All students must complete two (2) WI designated classes to fulfill degree requirements

### Major Elective Courses

| Major Elective Courses  | Credits | Prerequisites and Corequisites  |
|---|---------|---|
| BI-201 General Biology I*   | 4       | Complete developmental requirements in English  |
| BI-202 General Biology II   | 4       | BI-201  |
| BI-356 Principles of Genetics   | 4       | BI-201 (C or better)  |
| BI-357 Bioinformatics/Computational Biology                           | 3       | BI-201 (C or better)  |
| BI-453 Biotechnology  | 5       | BI-201 and permission of instructor   |
| CH-151 General Chemistry I*   | 4.5     | MA-119 and MA-121 or placement  |
| CH-152 General Chemistry II*  | 4.5     | Prerequisite: CH-151  |
| CH-251 Organic Chemistry I*   | 5       | Corequisite: CH-152 or permission of the department                                       |
| CH-252 Organic Chemistry II*  | 5       | Prerequisite: CH-251  |
| CH-900, 901 Cooperative Education in Chemical Instrumental Analysis   | 1       | Prerequisite: CH-152  |
| CH-911, 912 Independent Study and Research I                          | 1       | Corequisite for CH-911: CH-120 or CH-127 or CH-151; Prerequisite for CH-912: CH-911       |
| CH-913, 914 Independent Study and Research II                         | 1       | Prereqs for CH-913: CH-151 and CH-912; Prereqs for CH-914: CH-151 and CH-913              |
| CS-101 Algorithmic Problem Solving I*                                 | 4       | Corequisite: MA-441   |
| CS-201 Computer Organization and Assembly Language*                   | 4       | Prerequisites: CS-101 (C or better) and MA-441  |
| CS-203 Algorithmic Problem Solving II in C++*                         | 4       | Prerequisites: CS-101 (C or better) and MA-441  |
| CS-220 Discrete Structures  | 3       | Prerequisite: MA-471  |
| MA-442 Analytic Geometry and Calculus II*                             | 4       | Prerequisite: MA-441 (C or better)  |
| MA-443 Analytic Geometry and Calculus III*                            | 4       | Prerequisite: MA-442 (C or better)  |
| MA-451 Differential Equations*  | 4       | Prerequisite: MA-443 (C or better)  |
| MA-461 Linear Algebra*  | 4       | Prerequisite: MA-442 (C or better)  |
| MA-471 Introduction to Discrete Mathematics                           | 3       | Prerequisite: MA-440  |
| MA-481 Probability and Statistics                                     | 3       | Corequisite: MA-442   |
| PH-240 Computerized Physical Measurement Using Graphical Programming* | 3       | See catalog   |
| PH-301 College Physics I*   | 4       | Prerequisite: MA-114 OR MA-119 and MA-121   |
| PH-302 College Physics II*  | 4       | Prerequisite: PH-301 (C or better)  |
| PH-303 Scientific Use of Computers                                    | 2       | Prerequisite: Complete developmental requirements in math                                 |
| PH-311 College Physics A*   | 4       | Prerequisite: MA-441 or permission of Department  |
| PH-312 College Physics B*   | 4       | Pre/corequisite: PH-312   |
| PH-414 Analytical Mechanics   | 4       | Prerequisite: PH-411 Corequisite: MA-443  |
| PH-415 Electricity and Magnetism                                      | 4       | Prerequisite: PH-413 Corequisite: MA-443.   |
| PH-416 Thermodynamics*  | 4       | Prerequisite: PH-412 and MA-443   |
| PH-421 General Calculus Physics A*                                    | 5       | Corequisite: MA-441   |
| PH-422 General Calculus Physics B*                                    | 5       | Prerequisites: MA-441 and PH-421 (C or better); Corequisite: MA-442                       |
| PH-431 Calculus Optics  | 2       | Prerequisite: PH-201 or PH-411, MA-441; Corequisite: PH-231 and MA-442                    |
| PH-440 Modern Physics*  | 4       | Prerequisite: PH-422  |
| PH-450 Introduction to Physics Research                               | 3       | None  |
| PH-900 Research Projects  | 2       | Prerequisites: PH-201, PH-301, or PH-411; Corequisites: PH-202, PH-302, PH-412, or PH-413 |

Courses marked with an asterisk (\*) can be used to satisfy the Flexible Core requirement.