Degree Map

A.S. in Liberal Arts and Sciences (Mathematics and Sciences) – Catalog Year 2025-26

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. The document gives recommended courses for those who will pursue degrees in biology, chemistry, computer science, mathematics, or physics after graduation and transfer, see Recommended Elective Courses by Transfer Major below. This degree map is designed for students who place into MA-440. Additional degree maps are available for students who place into other levels of mathematics. Additionally, the college offers A.S. degrees in Biology, Chemistry, Computer Science, Environmental Science, Mathematics, and Physics. Please see 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

Courses	Credits	Prerequisites and Corequisites[1]
ENGL-101 English Composition I (Required Core 1A: English Composition)	3	Prerequisite: Complete developmental requirements in English
MA-440 Pre-Calculus Mathematics[2] (Required for Major) (Required Core 1B - Mathematical & Quantitative Reasoning)	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[3]	3	Check individual courses for prerequisites and corequisites
SP-211 Speech Communication[2,3] (Flexible Core 2B: U.S. Experience & Its Diversity)	3	None
HE-101 Personal Health and Wellness or HE-102 Health, Behavior and Society	1-2	Prerequisite: None
Total credits for the term	**14-15**	

Spring Semester #1

Courses	Credits	Prerequisites and Corequisites[1]
ENGL-102 English Composition II (Required Core 1A: English Composition)	3	Prerequisite: ENGL-101 or placement
MA-441 Analytic Geometry and Calculus I (Required for Major)	4	Prerequisite: MA-440 (C or better)
Required Core 1C[2] – Life & Physical Sciences Must take **BI-201, CH-151, PH-301, PH-311, or PH-421** – See Recommended Elective Courses by Transfer Major below	4-5	See tables below
Flexible Core 2E[2] – Scientific World Take one course from the list below marked with an asterisk (*)	4-5	Check individual courses for prerequisites and corequisites
Total credits for the term	**15-17**	

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Fall Semester #2

Courses	Credits	Prerequisites and Corequisites[1]
Additional Flexible Core Course[2,3] Take one course from the list below marked with an asterisk (*)	4-5	Check individual courses for prerequisites and corequisites
Major Elective Courses[4] - Take one course from the list below	3-5	Check individual courses for prerequisites and corequisites
One course from Flexible Core 2A, 2C, or 2D[3] (Recommended: History or Social Sciences course from 2A or 2D)	3	Check individual courses for prerequisites and corequisites
One course from Flexible Core 2A, 2C, or 2D[3]	3	Check individual courses for prerequisites and corequisites
One credit course in PE-100, PE-500, or DAN100 series	1	Check individual courses for prerequisites and corequisites
Total credits for the term	**14-16**	

Spring Semester #2

Courses	Credits	Prerequisites and Corequisites[1]
Major Elective Courses[4] - Take two to three courses from the list below	9-14	Check individual courses for prerequisites and corequisites
History or Social Science Course (Required for Major) (If taken in the Common Core, select another Major Elective)	3	Check individual courses for prerequisites and corequisites
Total credits for the term	**12-17**	
Total credits required for the degree	**60**	

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 specific 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, for example: BI-201 and BI-202, or CH-151 and CH-152, or CS-101 and CS-201, or MA-441 and MA-442, or PH-301 and PH-302, or PH-311 and PH-312, or PH-421 and PH-422).

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
RAD-101 Radiation Safety I	4	Corequisite: CH-151
RAD-102 Radiation Safety II	4	Prerequisite: CH-151; Corequisite: PH-301

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

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Recommended Elective Courses by Transfer Major

Major Elective Courses	Credits	Prerequisites and Corequisites
Biology Majors		
BI-201 General Biology I*	4	Complete developmental requirements in English
BI-202 General Biology II	4	BI-201
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
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)
Chemistry Majors		
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
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)
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
Computer Science Majors		
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-461 Linear Algebra*	4	Prerequisite: MA-442 (C or better)
MA-471 Introduction to Discrete Mathematics	3	Prerequisite: MA-440
Mathematics Majors		
EDUC-101 Contemporary Education: Principles and Practices**	4	Complete developmental requirements in English
INTE-221 Cognitive and Behavioral Learning in Secondary Mathematics**	3	See catalog
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

Major Elective Courses	Credits	Prerequisites and Corequisites
Physics Majors		
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-440 Modern Physics and Quantum Mechanics for Engineers*	4	Prerequisite: PH-422; Corequisite: MA-443
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
Radiation Science Majors		
BI-201 General Biology I*	4	Complete developmental requirements in English
CH-151 General Chemistry I*	4.5	MA-119 and MA-121 or placement
CH-152 General Chemistry II*	4.5	Prerequisite: CH-151
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)
RAD-101 Radiation Safety I	4	Corequisite: CH-151
RAD-102 Radiation Safety II	4	Prerequisite: RAD-101; Corequisite: PH-301

*Courses can be used to satisfy the Flexible Core requirement. **For students interested in teaching mathematics at the middle and high school level