

College of Science
Bachelor of Science in Systems Biology
Major in Systems Biology
For students graduating in calendar year 2020

I. Curriculum for Liberal Education (40 credit hours)

All courses used for the Curriculum for Liberal Education must be on the University's approved list.

Area 1 - Writing and Discourse (6 credit hours)

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Area 2 - Ideas, Cultural Traditions, and Values (6 credit hours)

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Area 3 - Society and Human Behavior (6 credit hours)

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Area 4 - Scientific Reasoning and Discovery (8 credit hours)

BIOL 1105 Principles of Biology* 3__ BIOL 1106 Principles of Biology* 3__

BIOL 1115 Principles of Biology Lab* 1__ BIOL 1116 Principles of Biology Lab* 1__

Area 5 - Quantitative and Symbolic Reasoning (8 credit hours)

MATH 1225 Calculus of a Single Variable* 4__ MATH 1226 Calculus of a Single Variable* 4__

Area 6 - Creativity and Aesthetic Experience (3 credit hours)

_____ 3__

Area 7 - Critical Issues in a Global Context (3 credit hours)

_____ 3__

II. Systems Biology Required Core (34 credit hours)

SYSB 2025 Intro to Systems Biology* 3__ SYSB 2026 Intro to Systems Biology* 3__

SYSB 3035 Syst Biol Genes Proteins* 4__ SYSB 3036 Syst Biol Genes Proteins* 4__

SYSB 3115 Network Dyn & Cell Physiol* 4__ SYSB 3116 Network Dyn & Cell Physiol* 4__

SYSB 4065 Res Exp Syst Biol* 4__ SYSB 4066 Res Exp Syst Biol* 4__

SYSB 4135 Professionalism in Syst Biol* 2__ SYSB 4136 Professionalism in Syst Biol* 2__

III. Computer Science Requirement (3 credit hours) Choose from:

CS 1044 Introduction to Programming in C* 3__ CS 1064 Intro to Programming in Python* 3__

CS 1114 Introduction to Software Design* 3__

IV. Statistics Requirement (3 credit hours) Choose from:

STAT 2004 Introductory Statistics* 3__ STAT 3005 Statistical Methods* 3__

STAT 3615 Biological Statistics* 3__

V. Additional Mathematics and Science (21 credit hours)

MATH 1114 Elementary Linear Algebra* 2__ CHEM 2514 Survey of Organic Chemistry* 3__

CHEM 1035 General Chemistry* 3__ CHEM 1036 General Chemistry* 3__

CHEM 1045 General Chemistry Lab* 1__ CHEM 1046 General Chemistry Lab* 1__

PHYS 2305 Foundations of Physics I* 4__ PHYS 2306 Foundations of Physics I* 4__

VI. Restricted Electives (9 credit hours)

BIOL 3774 Molecular Biology*	3__	BIOL 4104 Developmental Biology*	3__
BIOL 4624 Microbial Genetics*	3__	BIOL 4634 Microbial Physiology*	3__
BIOL 4734 Inflammation Biology*	3__	BIOL 4844 Proteomics & Biol Mass Spec*	3__
BIOL 4874 Cancer Biology*	3__	BIOL 4884 Cell Biology*	3__
CHEM 2536 Organic Chemistry*	3__	CHEM 4615 Phys Chem for Life Sciences*	3__
CHEM 4616 Phys Chem for Life Sciences*	3__	BCHM 3114 Biochem for Biotech and Life Sci*	3__
PHYS 4714 Intro to Biophysics*	3__	MATH 2214 Intro to Differential Equations*	3__
MATH 2204 Intro to Multivariable Calculus*	3__	MATH 4254 Chaos & Dynamical Syst*	3__
MATH 4454 Applied Math Modeling*	3__	MATH 4446 Intro to Numerical Analysis*	3__
MATH 4445 Intro to Numerical Analysis*	3__	STAT 2524 Data Science*	3__
STAT 3006 Statistical Methods*	3__	STAT 3104 Probability & Distributions*	3__
STAT 4364 Intro Statistical Genomics*	3__	CS 2114 Software Design and Data Structures*	3__
CS 3414 Numerical Methods*	3__	CS/CMDA 3634 CS Foundations for CMDA*	3__
CS 4214 Simulation & Modeling*	3__	CMDA 3605 Mathematical Modeling*	3__
CMDA 3606 Mathematical Modeling*	3__		

VII. Free Electives (10 credit hours)

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Prerequisites

Some courses in the major requirements listed above may have prerequisites. Students are required to double check course prerequisites and equivalents. Please see your advisor or consult the Undergraduate Course Catalog for more information.

Acceptable Substitutions

BIOL 1105, 1106, 1115, 1116; CHEM 1035, 1036, 1045, 1046; PHYS 2305, 2306; MATH 1225, 1226, 1114 can be substituted with ISC 1105, 1106, 1115, 1116, 2105, 2106, 2115, 2116.

CHEM 2514 can be substituted with CHEM 2535.

MATH 1114 can be substituted with MATH 2114.

MATH 1225, 1226 can be substituted with MATH 1025, 1026.

PHYS 2305, 2306 can be substituted with PHYS 2205, 2206, 2215 & 2216.

BIOL 1105, 1115, 1106, 1116 can be substituted with BIOL 1005, 1015, 1006, 1016.

Foreign Language Requirement

Students who did not successfully complete at least two years of a single foreign, classical, or sign language during high school must successfully complete six semester hours of a single foreign, classical, or sign language at the college level. Courses taken to meet this requirement do not count toward the hours required for graduation. Please consult the Undergraduate Catalog for details.

Satisfactory Progress Towards Degree

Upon having completed 72 credit hours (including transfer, AP, advanced standing, credit by examination, course withdrawal) students must have completed the following courses with a grade of C- or better in two or fewer attempts (including attempts that were withdrawn): BIOL 1105, BIOL 1106, BIOL 1115, BIOL 1116, CHEM 1035-1036, CHEM 1045-1046, CHEM 2514, MATH 1225-1226, and PHYS 2305-2306. This also applies to acceptable substitutions

Graduation Requirements

120 credit hours are required for graduation. These credits must include the courses required for the major (see above section). To graduate, a student must have at least a 2.0 in-major GPA and 2.0 overall GPA. If 120 credit hours are reached and a student does not meet the GPA requirement, the student must take additional in-major courses to raise the in-major GPA to a 2.0.

*In Major GPA: Courses used to calculate in-major GPA