BS Data Science: Bioinformatics Requirements

The major in Data Science focuses on the core concepts in computer science and mathematics, allowing students to build a foundation. Students will gain an understanding of basic programming, database, data analytics, and mathematics concepts to create a foundation in data science. They will also learn how to apply these concepts to a concentration area for a more general focus on data science. The concentration areas are bioinformatics, geospatial information, and mathematics.

Note that all students must achieve 120 undergraduate credits and a minimum 2.0 overall GPA to graduate. The final major GPA requirement for Data Science with a concentration in Bioinformatics is 2.25.

Required Computer Science Core Courses – 27 credits

CPSC 105 Introduction to Data Visualization (3 credits)
CPSC 123 Introduction to Scientific Programming *or* CPSC 135 Computer Science I (3 credits)
CPSC 125 Discrete Math for Computer Science I (3 credits)
CPSC 150 Ethical, Legal, and Professional Impacts of the Digital Age (3 credits)
CPSC 223 Advanced Scientific Programming (3 credits)
CPSC 256 SQL Programming (3 credits)
CPSC 356 Introduction to Database Management Systems (3 credits)
CPSC 458 Data Mining and Predictive Analytics I (3 credits)
CPSC 459 Introduction to Data Mining (3 credits)

Required Mathematics Courses – 6 credits

MATH 250 Applied Regression Analysis (3 credits)
MATH 304 Statistical Programming *or* MATH 325 Applied Time Series Analysis (3 credits)

Computer Science Electives – 6 credits

6 additional credits of CPSC courses numbered 125 or higher, not previously used for above requirements, excluding CPSC 280 and CPSC 380.

Bioinformatics Concentration – 19 to 21 credits

BIOL 106 Introduction to Zoology *or* BIOL 108 Introduction to Botany (4 credits)
BIOL 120 Anatomy and Physiology I *or* BIOL 2xx/3xx (3 or 4 credits)
BIOL 122 Anatomy and Physiology II *or* BIOL 2xx/3xx (3 or 4 credits)
BIOL 216 Genetics (3 credits)
BIOL 255 Introduction to Bioinformatics (3 credits)
BIOL 270 Research Methods *or* BIOL 370 Research in Biology *or* BIOL 395 Honors Independent Study / Thesis (3 credits)

Directed General Education Courses – 10 to 11 credits

The following courses are required to fulfill the major requirements and are suggested to satisfy general education.
BIOL 104 Principles of Biology – Category C1 (4 credits)
MATH 105 or higher – Category C2 (3 or 4 credits)
MATH 140 Applied Statistics *or* MATH 150 Introduction to Biostatistics – Category C3 (3 credits)

Program Plan Code: BS_DASC_BIIN
Effective Semester: Fall 2024

BS Data Science: Bioinformatics Major Check Sheet

Student Name: Student ID Number:

This check sheet provides a mechanism for students and advisors to keep track of a student's progress in the program. Please refer to the program requirements for more details regarding options.

Note that all students must achieve 120 undergraduate credits and a minimum 2.0 overall GPA to graduate. The final major GPA requirement for Data Science with a concentration in Bioinformatics is 2.25.

Required Computer Science Core Courses - 27 credits

CPSC 105 Introduction to Data Visualization	3 credits	Grade:
CPSC 123 Introduction to Scientific Programming I *or* CPSC 135 Computer Science I	3 credits	Grade:
CPSC 125 Discrete Math for Computer Science I	3 credits	Grade:
CPSC 150 Ethical, Legal, and Professional Impacts of the Digital Age	3 credits	Grade:
CPSC 223 Advanced Scientific Programming	3 credits	Grade:
CPSC 256 SQL Programming	3 credits	Grade:
CPSC 356 Introduction to Database Management Systems	3 credits	Grade:
CPSC 458 Data Mining and Predictive Analytics I	3 credits	Grade:
CPSC 459 Introduction to Big Data	3 credits	Grade:
Total Credits	27 total credits	

Required Mathematics Courses - 6 credits

MATH 250 Applied Regression Analysis	3 credits	Grade:
MATH 304 Statistical Programming *or* MATH 325 Applied Time Series Analysis	3 credits	Grade:
Total Credits	6 total credits	

Computer Science Electives - 6 credits

Course 1:	3 credits	Grade:
Course 2:	3 credits	Grade:
Total Credits	6 total credits	

Bioinformatics Concentration Courses – 19 to 21 credits

BIOL 106 Introduction to Zoology *or* BIOL 108 Introduction to Botany	4 credits	Grade:
BIOL 120 Anatomy and Physiology I *or* BIOL 2xx/3xx	3 or 4 credits	Grade:
BIOL 122 Anatomy and Physiology II *or* BIOL 2xx/3xx	3 or 4 credits	Grade:
BIOL 216 Genetics	3 credits	Grade:
BIOL 255 Introduction to Bioinformatics	3 credits	Grade:
BIOL 270 Research Methods *or* BIOL 370 Research in Biology *or* BIOL 395 Honors Independent Study/Thesis	3 credits	Grade:
Total Credits	19-21 total credits	

Directed General Education Courses – 10 to 11 credits

BIOL 104 Principles of Biology (Category C1)	4 credits	Grade:
MATH 105 or higher (Category C2)	3-4 credits	Grade:
MATH 140 Applied Statistics *or* MATH 150 Introduction to Biostatistics (Category C3)	3 credits	Grade:
Total Credits	10-11 total credits	

Summary of Graduation Requirements

Total credits from major courses	**58-60**
Total credits from general education program	**42-45**
Total credits from university electives	**15-20**
Minimum total credits to graduate	**120**
Minimum overall GPA	**2.0**
Minimum GPA in major program	**2.25**
Comprehensive Exam (capstone class)	**PASS**

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Effective Semester: Fall 2024

BS Data Science: Bioinformatics
8-Semester Planner

Student Name: Student ID Number:

Each semester listed below provides information including course categories, typical credit hours (CH.), and space to add specific course selections. This planner is a suggested path. Consult with your advisor regarding your unique plans and interests as you make choices about your schedule.

First Semester Plan

Gen Ed	Category A1	3 CH.	Selection:
Gen Ed	Category B	3 CH.	Selection:
Gen Ed	FYSM 100	3 CH.	Selection:
Major	CPSC 105	3 CH.	Selection:
Major	CSPC 123 *or* CPSC 135	3 CH.	Selection:
Total		**15 CH.**	

Second Semester Plan

Gen Ed	Category A2	3 CH.	Selection:
Gen Ed	BIOL 104 (C1)	4 CH.	Selection:
Gen Ed	MATH 140 *or* MATH 150 (C3)	3 CH.	Selection:
Major	CPSC 125 *or* CPSC 223	3 CH.	Selection:
Major	CPSC 150	3 CH.	Selection:
Total		**16 CH.**	

Third Semester Plan

Gen Ed	MATH 105 or higher (C2)	3 CH.	Selection:
Major	CPSC 125 or CPSC 223	3 CH.	Selection:
Major	CPSC 256	3 CH.	Selection:
Major	MATH 250	3 CH.	Selection:
Major	BIOL 106 *or* BIOL 108	4 CH.	Selection:
Total		**16 CH.**	

Fourth Semester Plan

Gen Ed	Category A3	3 CH.	Selection:
Gen Ed	Category B	3 CH.	Selection:
Major	CPSC 356	3 CH.	Selection:
Major	MATH 304 *or* MATH 325	3 CH.	Selection:
Major	BIOL 216	3 CH.	Selection:
Total		**15 CH.**	

Fifth Semester Plan

Gen Ed	Category A4	3 CH.	Selection:
Gen Ed	Category D	3 CH.	Selection:
Major	CPSC Elective Course	3 CH.	Selection:
Major	BIOL 120 *or* BIOL 2xx/3xx	3 or 4 CH.	Selection:
Elective	University Elective	3 CH.	Selection:
Total		**15-16 CH.**	

Sixth Semester Plan

Gen Ed	Category D	3 CH.	Selection:
Major	CPSC 458 *or* CPSC 459	3 CH.	Selection:
Major	BIOL 122 *or* BIOL 2xx/3xx	3 or 4 CH.	Selection:
Elective	University Elective	3 CH.	Selection:
Elective	University Elective	3 CH.	Selection:
Total		**15-16 CH.**	

Seventh Semester Plan

Gen Ed	Category B	3 CH.	Selection:
Major	CPSC 458 *or* CPSC459	3 CH.	Selection:
Major	BIOL 255	3 CH.	Selection:
Elective	University Elective	3 CH.	Selection:
Elective	University Elective	3 CH.	Selection:
Total		**15 CH.**	

Eighth Semester Plan

Gen Ed	Category D	3 CH.	Selection:
Major	CPSC Elective Course	3 CH.	Selection:
Major	BIOL 270 *or* BIOL 370 *or* BIOL 395	3 CH.	Selection:
Elective	University Elective	3 CH.	Selection:
Total		**12 CH.**	

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Effective Semester: Fall 2024