Data Science and Analysis BS, Biology Emphasis

General Education Requirements

Students must satisfy the university general education requirements. Many of the courses for the degree may be used to fulfill math proficiency, information literacy, social science, and math and life/natural sciences requirements. The program recommends students take ENGL 3130 Technical Writing or ENGL 3120 Business Writing to satisfy the Junior-Level Writing requirement. Emphasis areas may require one of these courses. There is no foreign language requirement for the degree.

Satisfactory/Unsatisfactory Option

Courses required for the major may not be taken on a satisfactory/unsatisfactory basis.

Degree Requirements

The BS in Data Science and Analysis consists of a set of core courses along with an emphasis area. Students must earn a minimum grade of C- in all core courses and emphasis area courses.

Core Courses

Calculus Course		
MATH 1800	Analytic Geometry and Calculus I [1]	3-5
or MATH 1100	Basic Calculus	
Statistics Course		**3**
The Introduction to Statistics course should align with the student's Discipline Emphasis Area.		
Choose one of the following:		
SOC 3220	Quantitative Data Analysis in Social Science Research	
BIOL 4122	Biostatistics	
ECON 3100	Economic Data and Statistics	
CRIMIN 2220	Statistical Analysis in Criminology and Criminal Justice	
MATH 1320	Introduction to Probability and Statistics	
PSYCH 2201	Psychological Statistics	
POL SCI 3000	Political Analysis	
SCMA 3300	Business Analytics and Statistics	
Additional Required Courses		
MATH 4005	Exploratory Data Analysis with R	3
CMP SCI 1250	Introduction to Computing	3
CMP SCI 4200	Python for Scientific Computing and Data Science	3
CMP SCI 4342	Introduction to Data Mining [2]	3
or MATH 4250	Introduction to Statistical Methods in Learning and Modeling	
Total Hours		**18-20**

[1] Students interested in the Computer Science emphasis area, the Mathematics Emphasis Area, or in taking additional mathematics courses should take MATH 1800.

[2] MATH 4250 is available for Mathematics Emphasis Area students.

Emphasis Area Requirements

BIOL 1821	Introductory Biology: Organisms and the Environment (MOTR BIOL 150L)	5
BIOL 1831	Introductory Biology: From Molecules to Organisms (MOTR BIOL 150L)	5
BIOL 2012	Genetics	3
CHEM 1111	Introductory Chemistry I (MOTR CHEM 150L)	5
BIOL 4436	Applied Bioinformatics	3
Choose three of the following:		9
BIOL 2102	Ecology	
BIOL 3302	Evolution	
BIOL 3622	Cell Biology	
BIOL 4182	Population Biology	
BIOL 4602	Molecular Biology	
BIOL 4732	Principles of Biochemistry	
Total Hours		**30**

Learning Outcomes

Upon completion of the program, graduates will be able to:

- Apply knowledge of statistical data collection, analysis and quantitative modeling techniques
- Demonstrate proficiency in industry-standard programming languages that support data acquisition, retrieval and analysis
- Select, apply and build data-based models and visualizations to devise solutions to data science problems
- Effectively communicate technical results and recommendations in various formats to appropriate audiences
- Demonstrate an understanding of the fundamental principles of biology including the structure and functions of cells and their components, heredity and variation in populations, and evolution
- Apply statistical concepts and data science methods to analyze real-world problems in biology