

Data Science and Analytics

Co-Directors: [Michael Higgs](#), [Kevin Simmons](#)

The Data Science and Analytics minor provides an interdisciplinary approach to prepare students in the acquisition, transformation, analysis, interpretation, and communication of data crucial to effective decision making in their areas of interest. The minor provides students with a working knowledge of a varied set of data analytic methods, based on a wide variety of data types, formats, and sources. The minor prepares students for additional graduate training or analytic roles in the workplace.

Degree Plans Offered in Data Science and Analytics

Minor in Data Science and Analytics

A **minor in data science and analytics** consists of:

Required Core Courses (3 courses)

- _____ DSA 241 Foundations of Data Science Data Analytics
- _____ DSA 230 Database Systems
- _____ DSA 371 Econometrics

Domain Electives* (2 courses)

- _____ ENVS 245 Food Systems
- _____ CS 201 Discrete Mathematics
- _____ BA/ECO 252 Business Analytics
- _____ ECO 372 Predictive Analytics
- _____ CS 441 Machine Learning
- _____ MATH 321 Numerical Analysis
- _____ MATH 385 Probability Theory
- _____ MATH 401 Mathematical Biology

*See additional requirements in Other Considerations When Planning for the Minor.

Supporting Courses

- _____ MATH 120 Elementary Statistics or equivalent, SSCI 120 Social Science Statistics, PSY 120 Psychological Statistics, or PSCI 271 Quantitative Methods
- _____ DSA 111 Introduction to Scripting and Data Analytics with Python
- _____ MATH 151 Calculus I (recommended)

Other Considerations When Planning for the Minor:

- At least one of the domain electives must be outside of the student's other declared majors or minors.
- A course may not count for more than one major and/or minor.

Total Credits Requirement = 5 course credits

COURSES

DSA 111 Introduction to Scripting and Data Analytics with Python

A study of the Python programming language and how it is used to acquire, prepare, transform, analyze, and visualize data from a variety of sources including social science, humanities, and science domains. Students will learn the basics of Python scripting as well as common data analytics libraries. Recommended for any student wanting to learn how to manipulate and visualize data in their area of interest. Requirements met: Quantitative Competency (pre-Fall 2019). Cross-listed with Computer Science 111. (Each spring)

DSA 230 Database Systems

A system level study of bulk storage devices and data storage schemes; database management systems survey; EER/OO modeling; SQL, logical and physical database analysis, design, and implementation; relational and object-oriented database models; client/server architectures; small projects. PREQ: Data Science Analytics 111. Cross-listed with Computer Science 330. (Every spring)

DSA 241 Foundations of Data Science Data Analytics

This course will provide a broad introduction to the principles, processes, and models of Data Science Analytics. We survey all methods including regression and non-regression models, decision-tree based models, graphical models, and neural network models. Students also learn how to analyze and interpret, summarize and draw inference, extrapolate and make predictions. Students learn how to discover emerging patterns in data. Students learn how to visualize and effectively communicate insights gained from their analysis. Students will also gain experience using the R programming language. PREQ: Mathematics 120 or equivalent and Data Science and Analytics/Computer Science 111. (Each fall)

DSA 371 Econometrics

This course introduces students to the techniques necessary to perform empirical economic research. Topics to be covered include multivariate regression, model diagnostics, and the interpretation of regression results. Students will learn how to use SAS to perform data analysis. PREQ: Mathematics 120 or Social Science 120, and Mathematics 151. Requirements met: Social Sciences Breadth/Discover. Cross-listed with Economics 371. (Each fall)