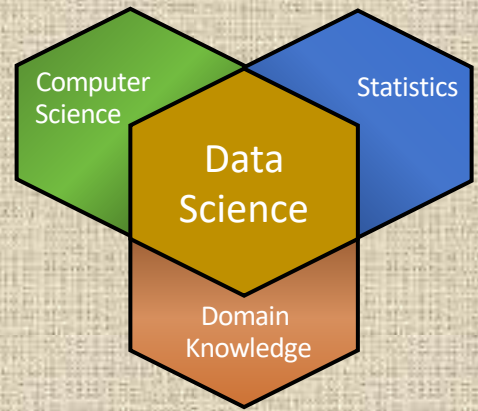# Shippensburg University
Data Science Minor
Mathematics Department

Data Science

Shippensburg's data science program focuses on developing the concepts and skills needed to extract meaningful information from data. Combining computational and statistical thinking, students will be able to effectively use data in many areas: the social sciences (policy impact, census, crime, survey data), the natural sciences (gene sequencing, health records), the humanities (digitized historical records, archeological data), and industry (finance, insurance, manufacturing). The minor examines the entire process of data science including the implementation of a practical workflow for analyzing data.

Minor Requirements

1) A **computer programming** course chosen from:
   - CSC 104: Programming in Python
   - CSC 110: Computer Science I
   - ENGR 110: Modeling and Simulation
   - ENGR 120: Programming for Engineers
   - MIS 240: Intro to Programming Concepts
   - SWE 100: Intro to Software Engineering
2) Two **statistics** courses:
   - MAT 217: Statistics I
   - MAT 317: Statistics II
3) Two **data science** courses:
   - MAT 219: Data Science I
   - MAT 319: Data Science II
4) A **domain area capstone** course

Domain Area Capstones

Other courses approved on a case-by-case basis.
Biology
   - BIO 397: Introduction to Research
   - BIO 398: Research II
Communication/Journalism
   - COM 432: Public Relations Research and Campaigns
Computer Science
   - CSC 499: Senior Research and Development
Economics
   - ECO 333: Research and Analysis in Economics
Exercise Science
   - ESC 453: Research Design and Statistics
Geography
   - GEO 363: Geographic Information Systems II
   - GEO 440: Field Techniques
   - GEO 441: Quantitative Methods
Human Communication Studies
   - HCS 360: Research Methods in Communication
History
   - HIS 386: History Research Seminar
Marketing
   - MKT 430: Marketing Research
Political Science
   - PLS 301: Political Science Research Methods
Psychology
   - PSY 301: Experimental Psychology
Social Work
   - SWK 360: Research Techniques for Social Workers
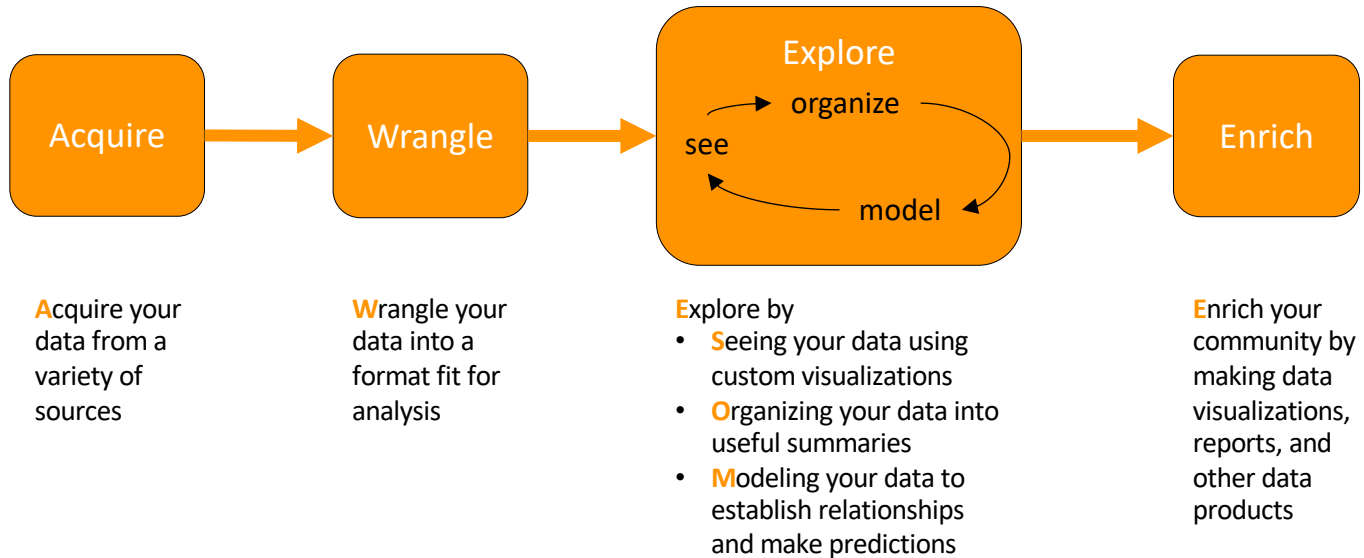   - SWK 462: Seminar in Social Work Methods
Sociology
   - SOC 385: Introduction to Sociology Research
Supply Chain Management
   - SCM 481: Decision Models for SCM

The Awesome Process of Data Science

We consider both a conceptual framework and a practical implementation of this entire process.

Acquire	Wrangle	Explore see → organize → model	Enrich

Acquire your data from a variety of sources

Wrangle your data into a format fit for analysis

Explore by
- **S**eeing your data using custom visualizations
- **O**rganizing your data into useful summaries
- **M**odeling your data to establish relationships and make predictions

Enrich your community by making data visualizations, reports, and other data products

Why Data Science

Data science is concerned with better understanding how the world works by maximizing the insight we can get from data. It is inherently interdisciplinary, providing a great opportunity to bring a data-savvy approach to the work and research that interests you most. The tools of modern data science allow you to explore a variety of complex topics and communicate your findings via presentations, traditional reports, and other data products like interactive dashboards.

Examples of Projects at Ship

- Creating an interactive automobile crash risk map of Philadelphia
- Deciding where to put treatment centers to best combat the opioid crisis in Pennsylvania
- Comparing the twitter feeds of CNN, the NY Times, HuffPost, and Fox News during the 2016 presidential election
- Improving the performance of professional Dota 2 teams
- Tracking chronic wasting disease in the U.S. deer population.

For more information please contact Dr. Bryant at lebryant@ship.edu.