DATA HUB (DATA)

DATA 1010 Introduction to Data (3)
DATA 1010 aims to provide students with an overview to what data is, how it is used correctly and incorrectly, how it is found, stored, and managed, and how it can be used as a basis for decision making and analysis. The overall goal of this course is to increase data literacy, such that students are more confidently able to work with the increasing amounts of data in their lives, jobs, and academic careers. This course is aimed towards students in all schools and fields and has no prerequisites.

DATA 1940 Transfer Course Work (0-4)
Transfer Coursework

Maximum Hours: 99

DATA 2020 Data Analysis (3)
This course provides an overview of the statistical tools most commonly used to analyze quantitative data. Topics include describing data, statistical inference, statistical significance, hypothesis testing, and regression analyses. The course focuses on understanding how to use appropriate analytical techniques and interpret the results of statistical analyses for variables with different levels of measurement. For each topic area, the methodology, including the underlying theory, assumptions, and mechanics of how each analytical tool works, is discussed, along with the appropriate interpretation of results. Concepts are presented in the context of real-world examples using publicly available data sets. The course will also introduce students to statistical software. Students of all skill levels are welcome, including those with limited or no statistical, mathematical, or programming backgrounds. All data analysis skills will be taught in class.

DATA 2030 Data Visualization (3)
Students will examine different creative and analytical theories and techniques for understanding and developing data visualizations, including maps, graphs, charts, and interactive tools such as dashboards. Students will access and clean data for visualizing potential, analyze data visualizations for bias and persuasive intent, and create data visualizations to communicate findings and tell engaging stories for diverse audiences. Students will also consider the societal role that data visualizations play in validating knowledge while exploring ethical concerns and critiques around communicating arguments visually. As practice, students will storyboard, create, peer review, and justify design choices when using a variety of open-source data visualizations. Students of all skill levels are welcome, and all data visualization skills will be taught in class.

DATA 2040 Text and Qualitative Data Analysis (3)
This course provides an overview of the tools most commonly used to analyze data from textual or qualitative sources such as written or digital text, interviews, focus groups, and opened-ended survey questions. Both manual (i.e., by hand) and software analytic approaches will be explored. For each type of analysis, the underlying theory, assumptions, and mechanics of how each analytical tool works, are discussed, along with appropriate interpretation of results. The course is designed for students from any major with real-world examples drawn from the humanities, social and behavioral sciences, business, and government. Students of all skill levels are welcome, including those with limited or no statistical, mathematical, or programming backgrounds. All analysis skills will be taught in class.

DATA 2150 Applied Generative Artificial Intelligence (3)
The introduction of widely available and accessible generative Artificial Intelligence tools, such as ChatGPT, democratizes expertise, unlocks knowledge, and bestows impressive abilities. This hands-on course provides students with practical experience employing generative AI to perform real-world tasks. By the end of the course, students will be able to effectively collect accurate historical and real-time information, generate high-quality text and media, transform content between formats, analyze data to derive insights and deploy generative AI to tackle private and professional challenges.

DATA 2810 Special Topics (3)
Special Topics in Data Literacy. Course may be repeated up to unlimited credit hours.

Maximum Hours: 99

DATA 2940 Transfer Coursework (0-20)
Transfer Coursework

Maximum Hours: 99

DATA 3010 Introduction to Data Collection and Wrangling (3)
This course provides an intensive introduction to data collection, wrangling, and summarization using the R programming language. Students will learn the fundamental skills required to collect, re-shape, transform, manipulate, analytically explore, summarize, and visualize data. Students will learn how data must be organized and formatted in order to perform effective data analysis or be inputted into a machine learning algorithm. Further, students will learn how to produce data-driven dynamic web applications. The time students allocate to learn these data-related skills will allow them to create data sets that promote more efficient, reproducible, and understandable data science products. The course is designed for students from any major with real-world examples drawn from a variety of domains. Students of all skill levels are welcome, including those with limited or no statistical, mathematical, or programming backgrounds. All necessary skills will be taught in class.

DATA 3030 Data Science Research and Communication (3)
This course will examine how knowledge production processes relate to designing and communicating data and science research across various digital mediums. Students will develop their expertise in epistemology theories and practices relating to data research. This course will also cover ethical considerations when developing and promoting research using data. They will also examine how political and social issues such as race, gender, sexuality, and disability often affect how data stories are told and interpreted and the treatment of researchers online. This interdisciplinary course will engage a variety of fields, including data science, technology studies, and digital scholarship. Students will learn to use digital tools to convey science communication products. All technical skills will be taught in the course.

DATA 3530 GIS and Mapping Global Issues (3)
Geographic information systems (GIS) involve creating, storing, retrieving, analyzing, and visualizing spatial data. This course examines the global impact on social, political, economic, and environmental dynamics when using geographic information systems (GIS), global positioning systems (GPS), and other geospatial technologies in daily life. Readings and discussions will focus on global affairs, such as critical cartography, GIS integration with social theories, implications for crime, urban planning, scientific research, health, environmental justice, feminist perspectives, and the intersection of economic development with environmental shifts. This course will also introduce students to foundational concepts and skills in working with spatial data, including finding and creating data, spatial analysis, and GIS-based map production. Specific global affairs topics will be analyzed using ESRIs ArcGIS. Students will gather GIS data, analyze global affairs topics using GIS, and produce their own data projects.

DATA 3810 Special Topics (3)
Special Topics in Data Literacy. Course may be repeated up to unlimited credit hours.

Maximum Hours: 99

DATA 3940 Transfer Course Work (0-4)
Transfer Coursework

Maximum Hours: 99

DATA 4030 Data Ethics, Privacy, and Governance (3)
This seminar uses social frameworks to examine historical and contemporary questions around ethics, privacy, and governance. Students will be introduced to concepts relating to critical data studies, such as algorithm bias, machine learning, data colonialism, and critical code studies. Students will examine data in the context of medicine, privacy, capitalism, violence, moral responsibility, biometrics, governance, and labor practices. Readings and seminar discussions will involve identifying data problems and discussing solutions for creating responsible and beneficial data practices for their society. Students will storyboard, write, revise, and present a data ethics paper where they apply ethical reasoning to data issues. All technical skills will be taught in this course.

DATA 4040 Network Data Science (3)
This course provides an overview of the tools most commonly used to collect, analyze, and visualize network data. For each type of analysis, the underlying theory, assumptions, and mechanics of how each analytical tool works, are discussed, along with appropriate interpretation and visualization of the results. The course is designed for students from any major with real-world examples drawn from the social and behavioral sciences, economics and finance, biology, history, anthropology, social media, public health, and government. Students of all skill levels are welcome, including those with limited or no statistical, mathematical, or programming backgrounds. All analysis skills will be taught in class. However, it is highly recommended, but not required, that students complete DATA 2020 or an equivalent course in statistics and/or data analysis, preferably one that utilized the statistical computing programs R and RStudio, prior to enrollment.