DATA SCIENCE MAJOR, B.A.

The bachelor of arts (B.A.) in data science provides students with high-level development of competencies in mathematics, statistics, computational foundations, ethics, and communication. The curriculum aims to go beyond basic competencies, providing opportunities to integrate analytic techniques across a broad variety of coursework, and allow students to customize the application of data science knowledge according to discipline-specific domain specializations.

Student Learning Outcomes

Upon completion of the data science program, students should be able to:

- Understand data sources and constructs, including the conceptual and technical foundations of representing, organizing, retrieving, and using data and information
- Understand and implement ethical practices in data collection, management, analysis, and reporting, including privacy, security, and governance of data
- Build and understand algorithms for analyzing data and accurate numerical modeling for problems
- Use appropriate data analytics and statistical techniques to discover new relationships, deliver insights into research problems or organizational processes, and support decision-making
- Convey data analyses through written and oral communication skills as well as visualization techniques

Requirements

In addition to the program requirements, students must

- earn a minimum final cumulative GPA of 2.000
- complete a minimum of 45 academic credit hours earned from UNC–Chapel Hill courses
- take at least half of their major core requirements (courses and credit hours) at UNC–Chapel Hill
- earn a minimum cumulative GPA of 2.000 in the major core requirements. Some programs may require higher standards for major or specific courses.

For more information, please consult the degree requirements section of the catalog (https://catalog.unc.edu/undergraduate/degree-requirements/).

Code	Title	Hours
Core Requirements		
DATA 110	Introduction to Data Science	3
DATA 120	Ethics of Data Science and Artificial Intelligence	3
DATA 140	Introduction to Data Structures and Management	3
Select one of the following options:		3
DATA 130	Critical Data Literacy	
ENGL 480	Digital Humanities History and Methods	
ENGL 482	Metadata, Mark-up, and Mapping: Understanding the Rhetoric of Digital Humanities	
INLS 201	Foundations of Information Science	
SOCI 318	Computational Sociology	
Communications (select one):		3
COMM 113	Public Speaking	
COMM 171	Argumentation and Debate	
DATA 150	Communication for Data Scientists	
ENGL 119	Picture This: Principles of Visual Rhetoric	
ENGL 303	Scientific and Technical Communication	
ENGL 411	Writing for Clients: Technical Communication Practicum	
GEOG 115	Maps: Geographic Information from Babylon to Google	
GEOG 415	Communicating Important Ideas	
INLS 541	Information Visualization	
MEJO 102	Future Vision: Exploring the Visual World	
STOR 320	Introduction to Data Science	4
or STOR 455	Methods of Data Analysis	
Four additional courses from a specialization area (see below)		12
Additional Requirements		
COMP 110	Introduction to Programming and Data Science [H]	3-4
or COMP 116	Introduction to Scientific Programming	
or STOR 120	Foundations of Statistics and Data Science	
MATH 210	Mathematical Tools for Data Science	3
MATH 231	Calculus of Functions of One Variable I [H, F]	4
Total Hours		**41-42**

H Honors version available. An honors course fulfills the same requirements as the nonhonors version of that course. Enrollment and GPA restrictions may apply.

F FY-Launch class sections may be available. A FY-Launch section fulfills the same requirements as a standard section of that course, but also fulfills the FY-SEMINAR/FY-LAUNCH First-Year Foundations requirement. Students can search for FY-Launch sections in ConnectCarolina using the FY-LAUNCH attribute.

Specializations

Sociology

The sociology specialization enables students to understand how data, the analysis of data, and social scientific methodological approaches can be used to study people in society, including interpersonal dynamics, inequality, social structures, and cultural systems.

Code	Title	Hours
SOCI 251	Research Methods	3
Select three courses from the following list:		9
MNGT 345	Public Policy Toward Business	
MNGT 380	The Economics of Labor Relations	
SOCI 121	Population Problems	
SOCI 172	Introduction to Population Health in the United States	
SOCI 252	Data Analysis	
SOCI 277	Societies and Genomics	
SOCI 302	Fieldwork in Entrepreneurship	

SOCI 427	The Labor Force
SOCI 429	Religion and Society
Total Hours	**12**

Data and Society

This specialization equips students to understand the social, cultural, historical, and political dimensions and impacts of data-driven technologies. Students will learn critical capacities to engage with and evaluate contemporary technologies, understand their histories, and map their social impacts.

Code	Title	Hours
Select four courses from the following list:		12
COMM 83	First-Year Seminar: Networked Societies (first-year students only)	
COMM 86	First-Year Seminar: Surveillance and Society (fist-year students only)	
COMM 249	Introduction to Communication Technology, Culture, and Society	
COMM 348	Algorithms and Society	
COMM 360	Social Media and Society	
COMM 453	The History of New Media Technology in Everyday Life	
COMP 380	Technology, Ethics, & Culture [H]	
MEJO 242	From Gutenberg to Google: A History of Media	
HIST 322	Technology and American Culture	
HIST 328	History of the Computer	
Total Hours		**12**

H Honors version available. An honors course fulfills the same requirements as the nonhonors version of that course. Enrollment and GPA restrictions may apply.

Geographic Information Science

This specialization equips students to understand fundamentals of GIScience concepts and build expert knowledge in the use of geospatial technologies such as GIS, remote sensing, spatial analysis and modeling, database development and management, programming, Web GIS, and geovisualization.

Code	Title	Hours
GEOG 215	Introduction to Spatial Data Science	3
GEOG 370	Introduction to Geographic Information	3
Select two courses from the following list:		6
GEOG 391	Quantitative Methods in Geography	
GEOG 410	Modeling of Environmental Systems	
GEOG 456	Geovisualizing Change	
GEOG 477	Introduction to Remote Sensing of the Environment	
GEOG 491	Introduction to GIS	
GEOG 541	GIS in Public Health	
GEOG 544	Geographic Information Systems for Impact Evaluation and Health Studies	
GEOG 555	Cartography of the Global South	
GEOG 567	Geospatial Data Analysis with Google Earth Engine	
GEOG 577	Advanced Remote Sensing	
GEOG 591	Applied Issues in Geographic Information Systems	
GEOG 592	Geographic Information Science Programming	
Total Hours		**12**

Department Programs

Major

- Data Science Major, B.A. (p. 1)
- Statistics and Analytics Major, B.S. (https://catalog.unc.edu/undergraduate/programs-study/statistics-analytics-majors-bs/)

Minor

- Data Science Minor (https://catalog.unc.edu/undergraduate/programs-study/data-science-minor/)
- Statistics and Analytics Minor (https://catalog.unc.edu/undergraduate/programs-study/statistics-and-analytics-minor/)

Graduate Programs

- M.S. in Statistics and Operations Research (https://catalog.unc.edu/graduate/schools-departments/statistics-operations-research/)
- Ph.D. in Statistics and Operations Research (https://catalog.unc.edu/graduate/schools-departments/statistics-operations-research/)

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