

DATA SCIENCE (MS)

Students earning a MS in Data Science will gain a wide variety of skills needed to work with many different types of data, and to analyze, visualize, and extract useful information from data in a variety of ways. They will apply those skills in various contexts, especially during their capstone consulting class or thesis work. This 30-credit program has two tracks (thesis and non-thesis), can be completed full-time or part-time, and includes courses from Computer Science, Statistics, and Mathematics.

CURRICULUM

The Master of Science in Data Science requires 30 hours of coursework and a capstone project. Students may elect to conduct research and write a thesis instead of the capstone.

Non-thesis Track

Code	Title	Hours
Statistics Requirements		6
STAT 408	Applied Regression Analysis	
STAT 410	Categorical Data Analysis	
Computer Science Requirements		6
COMP 453	Database Programming	
COMP 458	Big Data Analytics	
Data Science Core		9
DSCI 401	Introduction to Data Science	
STAT 438	Introduction to Predictive Analytics or COMP 479 Machine Learning	
DSCI 470	Data Science Consulting (Capstone)	
Three Statistics or Computer Science 400 Level Electives ^{1,2}		9
Total Hours		30

¹ A list of all 400 level Computer Science courses can be found here (<https://catalog.luc.edu/graduate-professional/graduate-school/arts-sciences/computer-science/#coursestext>). A list of all 400 level Statistics courses can be found here (<https://catalog.luc.edu/graduate-professional/graduate-school/arts-sciences/mathematics-statistics/#coursestext>).

² For electives, students must take one COMP class for 3 credit hours, one STAT class for 3 credit hours, and one course in either COMP or STAT for 3 credit hours.

Thesis Track

Code	Title	Hours
Statistics Requirements		6
STAT 408	Applied Regression Analysis	
STAT 410	Categorical Data Analysis	
Computer Science Requirements		6
COMP 453	Database Programming	
COMP 458	Big Data Analytics	
Data Science Core		7
DSCI 401	Introduction to Data Science	
STAT 438	Introduction to Predictive Analytics or COMP 479 Machine Learning	
Research		11

DSCI 494	Data Science Research Design
DSCI 499	Data Science Research
DSCI 595	Thesis Supervision

Total Hours **30**

All PhD students and students in thesis-based Master's degree programs must successfully complete UNIV 370 Responsible Conduct in Research and Scholarship or other approved coursework in responsible conduct of research as part of the degree requirements. It is strongly recommended that students complete this two-day training before beginning the dissertation/thesis stage of the program.

Suggested Sequence of Courses

The below sequence of courses is meant to be used as a suggested path for completing coursework. An individual student's completion of requirements depends on course offerings in a given term as well as the start term for a major or graduate study. Students should consult their advisor for assistance with course selection.

Non-thesis Track

Course	Title	Hours
Year One		
Fall		
DSCI 401	Introduction to Data Science	4
STAT 408	Applied Regression Analysis	3
COMP 453	Database Programming	3
Hours		10
Spring		
STAT 410	Categorical Data Analysis	3
COMP 458	Big Data Analytics	3
COMP or STAT 400-Level Elective ¹		3
Hours		9
Year Two		
Fall		
STAT 438	Introduction to Predictive Analytics or COMP 479 or Machine Learning	3
COMP or STAT 400-Level Elective ¹		3
COMP or STAT 400-Level Elective ¹		3
DSCI 470	Data Science Consulting	2
Hours		11
Total Hours		30

¹ For electives, students must take one COMP class for 3 credit hours, one STAT class for 3 credit hours, and one course in either COMP or STAT for 3 credit hours.

Thesis Track

Course	Title	Hours
Year One		
Fall		
DSCI 401	Introduction to Data Science	4
STAT 408	Applied Regression Analysis	3
DSCI 494	Data Science Research Design	2
Hours		9

Spring

STAT 410	Categorical Data Analysis	3
DSCI 499	Data Science Research	3
COMP 458	Big Data Analytics	3
Hours		9

Year Two**Fall**

STAT 438 or COMP 479	Introduction to Predictive Analytics or Machine Learning	3
DSCI 499	Data Science Research	3
COMP 453	Database Programming	3
Hours		9

Spring

DSCI 499	Data Science Research	3
DSCI 595	Thesis Supervision	1
Hours		4
Total Hours		31

Graduate & Professional Standards and Regulations

Students in graduate and professional programs can find their Academic Policies in Graduate and Professional Academic Standards and Regulations (<https://catalog.luc.edu/graduate-professional-academic-standards-regulations/>) under their school. Any additional University Policies supercede school policies.

LEARNING OUTCOMES

- The ability to manage large data sets in preparation for data science analysis.
- A working knowledge of statistical techniques and computer algorithms, and the ability to apply these methods to a wide array of real-world problems.
- The ability to perform a data science analysis from beginning to end while adhering to the principles of reproducible and ethical research.
- The ability to program in both the R and Python programming languages.
- Complete a project demonstrating competence in the field of data science.
 - Non-thesis track: Students will be required to complete a real-world data science project prior to graduating from this program, either through our consulting course, an internship, an independent study, or other appropriate project
 - Thesis track: Students will be required to undertake a research project culminating in a thesis