Degree Requirements

The Master in Data Science (MSDS) program has two tracks: a Computational track and a Statistics track. Students can choose either of these two tracks and must successfully complete 30 credits based on any of the following options:

- Courses (30 credits)
- Courses (27 credits) + MS Project (3 credits)
- Courses (24 credits) + MS Thesis (6 credits)

Independent of the chosen option, all core courses in the respective tracks (Computational or Statistics) are required.

At most two courses can be chosen from outside the respective track with approval of the respective Program Co-Directors. Computational track students are allowed at most three electives that are non- Computer Science courses. Statistics track students are allowed at most three electives that are non-Math courses.

If a student chooses the MS project or MS thesis option, the project or thesis must be related to data science and requires approval from one of the Program Co-Directors.

The MSDS program has computational and statistics tracks that students must choose from at admission time. These tracks have different core courses but share the same admission requirements and electives.

Students may choose an elective outside the list after approval of their respective advisor.

M.S. in Data Science

Code	Title	Credits
Core Course Requirements for Computational Track		
CS 675	Machine Learning	3
CS 644	Big Data	3
CS 636	Data Analytics with R Programming	3
CS 698	Current topics in data science	3
Math 661	Applied Statistics	3
Core Course Requirements for Statistics Track		
Math 660	Introduction to statistical Computing with SAS and R	3
Math 661	Applied Statistics	3
Math 678	Statistical Methods in Data Science	3
CS 644	Big Data	3
CS 675 or Math 680	Machine Learning or Advanced Statistical Learning	3
Electives and Foundation Courses		**15**
Computer Science Electives		
CS 610	Data Structures and Algorithms	
CS 631	Data Management System Design	
CS 632	Advance Database System Design	

CS 636	Data Analytics with R Programming (only available to students in the Math core)
CS 639	Electronic Medical Records
CS 643	Cloud Computing
CS 645	Security and Privacy in Computer Systems
CS 659	Image Processing and Analysis
CS 661	Systems Simulation
CS 670	Artificial Intelligence
CS 683	Software Project Management
CS 684	Software Testing and Reliability
CS 681	Computer Vision
CS 708	Advance Data Security and Privacy
CS 731	Application of Database Systems
CS 732	Advance Machine Learning
CS 735	High Performance Analytics for Data Science
CS 744	Data Mining and Management in Bioinformatics
CS 782	Pattern Recognition
Math Electives	
Math 630	Linear Algebra and Applications
Math 631	Linear Algebra
Math 644	Regression Analysis Methods
Math 660	Introduction to Statistical Computing with SAS and R (only available to students in computational track)
Math 662	Probability Distributions (only available to students in computational track)
Math 664	Methods for Statistical Computing
Math 665	Statistical Inference (only available to students in computational track)
Math 678	Introduction to Statistical Methods in Data Science
Math 699	Design and Analysis of Experiments
Math 717	Inverse Problems and Global Optimization
Math 786	Large Sample Theory and Inference
Math 787	Non-parametric statistics
Other Electives	
BIOL 638	Computational Ecology
MGMT 635	Data Mining and Analytics for Managers
MGMT 630	Decision Analysis
FIN 600	Corporate Finance I
FIN 641	Derivatives Markets
FIN 642	Derivatives and Structured Finance
MRKT 613	Market Planning and Analysis

MRKT 630	Models of Consumer Behavior
IS 631	Enterprise Database Management
IS 665	Data Analytics for Information Systems
IS 687	Transaction Mining and Fraud Detection
IS 688	Web Mining
BNFO 601	Foundations of Bioinformatics I
BNFO 602	Foundations of Bioinformatics II
BNFO 615	Machine Learning for Bioinformatics
BNFO 620	Genomic Data Analysis
Total Credits	**30**

Recommended course sequence M.S. in Data Science for Computational Track

	Fall	**Spring**
Year 1	CS 675 Machine Learning Math 661 Applied Statistics CS 631 Data Management and System Design	CS 636 R for Data Science CS 644 Big Data CS 698 Current topics in Data Science
Year 2	Free elective or Master thesis course Free elective or Master project course Free elective	Free elective or Masters thesis course

Recommended course sequence for M.S. in Data Science for Statistics Track

	Fall	**Spring**
Year 1	Math 661 Applied Statistics Math 660 Intro to Statistical Computing with R and SAS Free elective	Math 678 Statistical Methods in Data Science CS 644 Big Data Math 630 Linear Algebra and Applications
Year 2	Free elective or Master thesis course CS 675 Machine Learning or Math 680 Advanced Statistical Learning Free elective	Free elective or Masters thesis course