

# Master of Science Degree Data Science Program Guide (G706)

Academic Program Guide for Masters Students (effective 2024)  
Department of Computer Science ([computerscience@rowan.edu](mailto:computerscience@rowan.edu))

## Program Information

The Master of Science in Data Science is designed for individuals with a Bachelor's degree in a STEM related field who are looking to expand their knowledge and opportunities in Data Science. The program has a strong background in Data Mining, Modeling, Statistical and Machine learning.

Students will be prepared to use algorithms, statistics, and technology to make informed decisions from massive amounts of data, to manage streamed data or data stored in massive data warehouses, and to visually analyze and present information. Courses are designed to provide expertise in the data sciences and train students to solve problems with complex sets of structured and unstructured data commonly found in any industry. Students may either take a thesis track or non-thesis track.

Rowan University undergraduates majoring in the Bachelor of Science in Computer Science program may apply to the Advanced Dual Degree (4+1) program which allows them to earn both the Bachelor of Science in Computer Science and the Master of Science in Data Science degrees in five years instead of six.

## Program Requirements

The M.S. in Data Science consists of 10 courses totalling 30 graduate semester hours (s.h.). Students may enroll in this program part-time or full-time.

### Required Courses – 6 s.h.

Course #	Course Name	Notes	Sem/Yr	Grade	Credits
CS 02505	Data Mining I				3
STAT 02515	Applied Multivariate Data Analysis				3
Subtotal: 6 s.h.					

### Core Courses – 9 s.h.

*Students must select any three of these core courses.*

Course #	Course Name	Notes	Sem/Yr	Grade	Credits
CS 02516	Big Data Tools and Techniques				3
CS 02620	Data Warehousing				3
CS 07556	Machine Learning I				3
DS 02510	Visual Analytics				3
ECE 09555	Advanced Topics in Pattern Recognition				3
ENGR 01511	Engineering Optimization				3
MATH 01505	Probability and Mathematical Statistics I				3
MATH 03511	Operations Research I				3
STAT 02509	Probability and Statistics for Data Science				3
Subtotal: 9 s.h.					

## Elective Courses / Thesis – 15 s.h.

*Thesis students must take 6 to 9 semester hours of Thesis Research.*

*Students can also use core courses as electives if not counting for the Core Course Section above.*

*Bank One (select up to 5 courses from these data science offerings)*

Course #	Course Name	Notes	Sem/Yr	Grade	Credits
BINF 05555	Bioinformatics - Advanced Biological Applications				3
CS 01541	Bioinformatics – Advanced Computational Aspects				3
CS 02530	Advanced Database Systems: Theory and Programming				3
CS 02570	Information Visualization				3
CS 02605	Data Mining II				3
CS 02625	Data Quality and Web/Text Mining				3
CS 02630	Advanced Topics in Database Systems				3
CS 07540	Advanced Design and Analysis of Algorithms				3
CS 07559	Advanced Models of Deep Learning				3
CS 07656	Machine Learning II				3
DS 01505	Data Science Capstone Practicum				3
DA 03510	Patient Data Understanding				3
DA 03511	Patient Data Privacy & Ethics				3
DA 03520	Healthcare Management				3
ECE 09558	Reinforcement Learning				3
ECE 09560	Artificial Neural Networks				3
ECE 09566	Advanced Topics in Systems, Devices, and Algorithms in Bioinformatics				3
ECE 09568	Discrete Event Systems				3
ECE 09585	Advanced Engineering Cyber Security				3
ECE 09586	Advanced Portable Platform Development				3
ECE 09595	Advanced Emerging Topics in Computational Intelligence, Machine Learning and Data Mining				3
ECE 09655	Advanced Computational Intelligence and Machine Learning				3
MATH 01506	Probability and Mathematical Statistics II				3
STAT 02510	Introduction to Statistical Data Analysis				3
STAT 02511	Statistical Computing				3
STAT 02514	Decision Analysis				3
STAT 02525	Design and Analysis of Experiments				3
STAT 02530	Applied Survival Analysis				3
STAT 02585	Introduction to Bayesian Statistical Methods				3

*Bank Two (select no more than 2 courses from these data analytics offerings)*

MGT 06603	Process Analytics				3
MGT 07500	Prospective Analytics				3
MGT 07510	Quality Analytics				3
MGT 07550	Operations Analytics				3
MGT 07600	Predictive Analytics				3

*Thesis students should take Thesis I, Thesis II, and optionally Thesis III*

DS 03650	Thesis I in Data Science				3
DS 03651	Thesis II in Data Science				3
DS 03652	Thesis III in Data Science				3

Subtotal: 15 s.h.

### **Minimum Required Grades and Cumulative GPA**

*The Master of Science in Data Science is a Category 3 program.*

*For details regarding satisfactory academic progress and graduation requirements, please visit [www.rowanu.com/policies](http://www.rowanu.com/policies).*