Data Science, M.S.

The M.S. in Data Science (M.S.D.S) offers students who hold bachelor's degrees in mathematics, statistics, computer science, engineering, business, health or related fields an opportunity to broaden their knowledge in the field of data science. Data Science is an interdisciplinary field consisting of mathematics, statistics, computer programming, data management, machine learning, and visualization. Data scientists are trained to capture, maintain, process, and analyze data from large and complex data. Students in the M.S.D.S. program will learn to extract and communicate meaningful information from data sets and become capable of communicating their findings in a way that positively affects decisions in business, healthcare, industry, government, and the defense industry. Graduates with the ability to understand and use big data are already being employed by institutions and industries including government, healthcare, scientific research facilities, and colleges and universities. Students who graduate with the M.S.D.S. will be able to manipulate, manage, and interpret data suitable to the employer's needs. The M.S.D.S. program is designed for students seeking careers in science, industry, or government; or for students who plan to pursue doctoral studies.

Admission Requirements

The selection of the applicants in Data Science tracks is based on the appropriate department approval. Hal Marcus College of Science and Engineering will determine the selection of applicants in the Analytics and Modeling track. The College of Business will determine the selection of students in the Analytics of Business Decisions track; and the Usha Kundu, MD College of Health will determine the selection of students in the Health Analytics track.

In addition to the University graduate admission requirements described in the Admissions section of the catalog, the applicant must meet the following minimum departmental admission requirements for regular admission:

- have obtained a Bachelor's degree from an accredited institution.
- have a minimum of 3.0 GPA (B or better average) on the undergraduate credits.
- Graduate Record Examination (GRE): Verbal score of at least 150 and Quantitative score of at least 150. GRE scores older than 5 years prior to admission may not be accepted.

If an applicant does not meet the above requirements, they may be considered for conditional admission. Please contact the department for more information.

- An applicant may be fully admitted if the student has all required undergraduate proficiency courses.
- An applicant may be provisionally admitted subject to completing the required undergraduate proficiency courses.

With the approval of the department, a maximum of six credit hours may be transferred into the program.

Prerequisite Course Requirements

Students seeking the M.S. in Data Science must have completed the following courses below prior to admission:

- Introduction to Statistics (STA 2023)
- Calculus I (MAC 2311)
- One programming course (i.e., COP 2253, COP 2334, COP 2830 or equivalent)

All students in the Data Science program must complete the following core courses. A grade of 'C' or better is required in all courses with an institutional GPA of 3.0 or higher.

Core Requirements

STA 5176	Statistical Modeling	3
STA 6235	Modeling in Regression	3
STA 6257	Advanced Statistical Modeling	3
Total Hours		**9**

Track Options

In addition to fulfilling core requirements, students will choose to pursue one of three tracks:

Analytics and Modeling Track

Department approved 5/6000-level electives. A maximum of 9 sh may be at the 5000-level.		9
Choose four courses from the following list. Selection is based on Hal Marcus College of Science and Engineering advisor approval.		12
COP 5725	Database Systems	
CAP 6789	Advanced Big Data Analytics	
MAP 6114	Machine Learning	
STA 6707	Multivariate Methods	
Total Hours		**21**

Analytics of Business Decisions Track

Department approved 5/6000-level electives. A maximum of 9 sh may be at the 5000-level.		9
Choose four courses from the following list. Selection is based on College of Business advisor approval.		12
MAN 6511	Operations Management Problems	
ISM 5404	Business Intelligence Applications	
ISM 6136	Big Data Mining: A Managerial Perspective	
GEB 5872	MBA Foundations: Financial Management I *	
GEB 5875	MBA Foundations: Management Skills and Applications *	
ACG 6309	Accounting for Decision Making **	
* GEB5872 and GEB 5875 are 1.5 SCH; must take both courses.		
** GEB 5872 must be taken before ACG 6309.		
Total Hours		**21**

Health Analytics Track

Department approved 5/6000-level electives. A maximum of 9 sh may be at the 5000-level.		9
Choose four courses from the following list. Selection is based on Usha Kundu, MD, College of Health advisor approval.		12
BSC 5459	Bioinformatics and Data Science	
PHC 6000	Epidemiology for Public Health Professionals	
PHC 6251	Disease Surveillance and Monitoring	
HSA 6197	Health Informatics	

HSA 6752	Quantitative Foundations and Data Analysis for Health Admin	
HSA 6385	Quality Improvement Processes in Health Organizations	
PHC 6194	GIS Applications in Public Health	
Total Hours		**21**

Certificate in Data Science

The Certificate in Data Science is a program both online and face-to-face. Online courses are offered both synchronous and asynchronous. Students admitted to the certificate program must successfully complete the four courses (for a total of 12 semester hours) listed below earning a grade of "C" or better in each course, and secure a combined grade point average of 3.0 or higher. Students are expected to complete the program in at most 3 semesters.

Admission Requirements

Participants must have a B.S. degree with a grade point average of 3.0 or higher. Participants that pursue this certificate in non-degree seeking status will not be required to complete the GRE for admissions into the certificate program.

Program Requirements

Prospective students for this certificate must contact the graduate advisor from the Department of Mathematics & Statistics to start the Declaration of Certificate process before the drop/add period of the semester of completion. To earn the certificate, students must complete the courses listed below within five years of admission into the program, earn a grade of 'C' or better in each of the four courses, and have a grade point average of 3.0 or higher for the combined courses. Students who obtain the certificate of Data Science must have a minimum GPA of 3.0 for the two core courses (STA 5176 and MAP 5471) to be eligible for the Data Science's Master's program.

All students in the Data Science certificate program must complete the following two core courses.

Core Requirements

STA 5176	Statistical Modeling	3
MAP 5471	Advanced Probability and Inferences	3
Total Hours		**6**

Electives

In addition to fulfilling two core requirements, students will choose to take two electives out of the following courses:

Choose two courses (six credit hours in total) from the following list. Selection is based on Hal Marcus College of Science and Engineering advisor approval.		6
COP 5725	Database Systems	
GEB 5872	MBA Foundations: Financial Management I *	
GEB 5875	MBA Foundations: Management Skills and Applications *	
ACG 6309	Accounting for Decision Making **	
ISM 6136	Big Data Mining: A Managerial Perspective	

* GEB5872 and GEB 5875 are 1.5 SCH; must take both courses.

** GEB 5872 must be taken before ACG 6309.

Total Hours	**6**