

Master of Science with Major in Data Science and Analytics—Business

The Master of Science with Major in Data Science and Analytics (MSDSA) is a multi-college interdisciplinary program jointly administered by the Department of Mathematical Sciences in the Charles E. Schmidt College of Science, the Department of Computer & Electrical Engineering and Computer Science in the College of Engineering and Computer Science, the Department of Information Technology and Operations Management in the College of Business and the Department of Political Science in the Dorothy F. Schmidt College of Arts and Letters. The program aims to prepare students with essential skill sets needed to analyze small, fast, big, massive and complex data. The following information pertains to the Data Science in Business Concentration.

General Curriculum Requirements

The MSDSA program offers both thesis and non-thesis options. Both options require a minimum of 30 credits. Students are required to take one common core course, two additional core courses, four concentration courses and three elective courses for the total of 30 credits. All Graduate Level courses, towards degree, must be 6000 level. The exact courses taken are to be determined by the students and their advisory committee. The thesis option requires only one elective course and 6 thesis credits. Students selecting the thesis option must complete and defend a written thesis successfully.

Data Science in Business Concentration Coursework

Course Title	Prefix & Number
Intro. to Data Science	CAP 5768
Intro. to Business Analytics and Big Data	ISM 6404
Choose ONE of the following: Biostatistics Data Mining and Machine Learning Special Topics (Quantitative Methods)	Choose ONE : STA 5195 CAP 6673 POS 6934
Choose FOUR of the following: Quantitative Communication Research Data Mining and Predictive Analytics Database Management Systems Advanced Business Analytics Social Media and Web Analytics Data Management and Analysis with Excel Data Analysis for Managers	Choose FOUR : COM 6316 ISM 6136 ISM 6217 ISM 6405 ISM 6555 QMB 6303 QMB 6603
Choose THREE Electives from the Electives Table <p style="text-align: center;">OR</p> Choose ONE Elective and Complete a Six-Credit Thesis	
Electives can come from any of the following categories: Business Analytics, Database and Cloud Computing, Data Mining and Machine Learning, Data Security and Privacy, Scientific Applications and Modeling, Social Data Science, or Statistics and Data Applications. The complete Electives Table is on the following page.	

Electives Table

Non-Thesis Track: Choose THREE (3) electives from any category. The electives do not have to come from the same category.

Thesis Track: Choose ONE (1) elective from any category and complete a six-credit thesis. Speak to an advisor for more information on the thesis option.

Business Analytics

Course Title	Prefix & Number
Data Mining and Predictive Analytics	ISM 6136
Database Management Systems	ISM 6217
Intro. to Business Analytics and Big Data	ISM 6404
Advanced Business Analytics	ISM 6405
Social Media and Web Analytics	ISM 6555
Data Management and Analysis with Excel	QMB 6303
Data Analysis for Managers	QMB 6603

Database and Cloud Computing

Course Title	Prefix & Number
Multiprocessor Architecture	CDA 6132
Cloud Computing	CEN 5086
New Directions in Database Systems	COP 6726
Theory & Implementation of Database Systems	COP 6731
Database Management Systems	ISM 6217

Data Mining and Machine Learning

Course Title	Prefix & Number
Introduction to Neural Networks	CAP 5615
Social Networks and Big Data Analytics	CAP 6315
Data Mining for Bioinformatics	CAP 6546
Machine Learning for Computer Vision	CAP 6618
Deep Learning	CAP 6619
Data Mining and Machine Learning	CAP 6673
Information Retrieval	CAP 6776
Web Mining	CAP 6777
Advanced Data Mining & Machine Learning	CAP 6778
Big Data Analytics with Hadoop	CAP 6780
Computational Advertising & Real-Time Analytics	CAP 6807
Computer Performance Modeling	CEN 6405
Data Mining and Predictive Analytics	ISM 6136

Data Security and Privacy

Course Title	Prefix & Number
Computer Data Security	CIS 6370
Cyber Security: Measurement and Data Analysis	CTS 6319
Mgmt of Information Assurance & Security	ISM 6328
Intro. to Cryptology & Information Security	MAD 5474
Cryptanalysis	MAD 6478
Quantum Mechanics 2	PHY 6646

Scientific Applications and Modeling

Course Title	Prefix & Number
Photogrammetry & Aerial Photography Interpr.	GIS 6028C
LiDAR Remote Sensing & Applications	GIS 6032C
Web GIS	GIS 6061C
Geospatial Databases	GIS 6112C
Hyperspectral Remote Sensing	GIS 6127
Spatial Data Analysis	GIS 6306
Special Topics (Quantum Info. Processing)	PHY 6938
Computational Physics	PHZ 5156
Numerical Relativity	PHZ 7609

Social Data Science

Course Title	Prefix & Number
Advanced Anthropological Research 1	ANG 6090
Advanced Anthropological Research 2	ANG 6092
Quant. Reasoning in Anthropological Research	ANG 6486
Social Networks and Big Data Analytics	CAP 6315
Quantitative Communication Research	COM 6316
Special Topics (Quantitative Methods)	POS 6934
Research Design in Political Science	POS 6736
Seminar in Advanced Research Methods	SYA 6305

Statistics and Data Applications

Course Title	Prefix & Number
Biomedical Data and Informatics	BSC 6459
Biostatistics	STA 5195
Statistical Computing	STA 6106
Survival Analysis	STA 6177
Biostatistics - Longitudinal Data Analysis	STA 6197
Applied Statistical Methods	STA 6207
Regression Analysis	STA 6236
Mathematical Statistics	STA 6326
Applied Time Series Analysis	STA 6857
Applied Computational Topology	MTG 6329