DATA SCIENCE AND ANALYTICS, BACHELOR OF SCIENCE (B.S.)

Data Science in the Natural Sciences Concentration

The Bachelor of Science with Major in Data Science and Analytics (BSDSA) 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 Electrical Engineering and Computer Science (EECS) in the College of Engineering and Computer Science, the Department of Information Technology and Operations Management (ITOM) in the College of Business, the Department of Political Science in the Dorothy F. Schmidt College of Arts and Letters and the School of Criminology and Criminal Justice in the College of Social Work and Criminal Justice. The program aims to prepare students with the essential skill sets across disciplines needed for data-driven applications in industry, business and government.

Admission Requirements

All students must meet the minimum admission requirements of the University. Refer to the Admissions section at https://www.fau.edu/registrar/university-catalog/pre-catalog/admissions/.

Degree Requirements

The minimum number of credits required for the Bachelor of Science with major in Data Science and Analytics is 120 credits: 36 credits in the Intellectual Foundations Program, 48 credits of major requirements and up to 36 credits of general electives. Additional requirements:

1. A minimum of 45 upper division credits;
2. Students must attain a minimum grade of "C" in all major courses to receive credit in the major; and
3. No major course with a pass/fail grade will be accepted.

Capstone

The Capstone for the B.S. degree with major in Data Science and Analytics is a cross college course that can be taken multiple times with a minimum of 3 credits as a requirement for the degree. Students apply their theoretical knowledge, methods and tools acquired during the Data Science and Analytics program to a real-world problem and engage in processing data and applying appropriate analytic methods to the problem. Students implement a solution using appropriate tools and can work individually or in teams under the supervision of the course instructor or another faculty member. This can be accomplished in three ways: an approved Project, Research Experience or Written Thesis.

Common Core (21 credits)

Course Name	Course Number	Credit	Prerequisites
Tools for Data Science	CAP 2751	3	
Experimental Design and Data Analysis	CAP 2753	3	STA 2023 or equivalent
Artificial Intelligence for Social Good	CCJ 3071	3	
Data Science Capstone	ISC 4941	3	CCJ 3071, CAP 2751, CAP 2753, MAP 2192, QMB 3302, and STA 2023
Mathematics for Data Science	MAP 2192	3	MAC 1105 or MGF 1106 and programming competency at the level of an online short course
Data Management and Analysis with Excel	QMB 3302	3	

Introductory Statistics	STA 2023	3	MAT 1033 or MAC 1105 or MGF 1106 or MAC 2233

Concentration Core Requirements (9 credits)

Course Name	Course Number	Credit	Prerequisites
RI: Introduction to Data Science	CAP 3786	3	COP 2220 or MAD 2502
Introduction to Computational Mathematics	MAD 2502	3	MAC 2311
Computational Statistics	STA 3100	3	MAC 2311 and STA 2023 or higher

Concentration Core Electives. Choose four courses (12 credits)

Course Name	Course Number	Credit	Prerequisites
Cryptography and Information Security	CIS 4362	3	MAS 2103 and MAD 2502
Graph Theory	MAD 4301	3	MAD 2104 and MAS 2103
Applied Mathematical Modeling	MAP 4103	3	(MAP 2302 or MAP 3305) and (MAS 2103 or MAC 2313)
RI: Industrial Problems in Applied Math	MAP 4913	3	(MAP 2302 or MAP 3305) and (MAS 2103 or MAC 2313)
Topology for Data Science	MTG 4325	3	MAD 2104, MAS 2103 and (COP 2220 or MAD 2502)
SAS for Data and Statistical Analyses	STA 3024	3	STA 2023 or equivalent
Introduction to Biostatistics	STA 3173	3	MAC 1105
Applied Statistics 1 Lab	STA 4202L	1	STA 4442; Corequisite: STA 4234
Statistical Designs	STA 4222	3	STA 4234 and MAC 2312
Applied Statistics 1	STA 4234	2	STA 4442; Corequisite: STA 4202L
Probability and Statistics 1	STA 4442	3	MAC 2312
Probability and Statistics 2	STA 4443	3	STA 4442
Applied Statistics 2	STA 4702	3	STA 4234
Applied Time Series and Forecasting	STA 4853	3	STA 4234 or equivalent

Electives (6 credits)

Choose two courses from the following List of Elective Courses for all Concentrations.

Arts and Letters Electives			
Course Name	**Course Number**	**Credit**	**Prerequisites**
Research Methods in Bioarchaeology	ANT 4192	3	ANT 2511 or ANT 3516 or ANT 3586 or ANT 4520
Information Technology in Public Administration	PAD 3712	3	
Introduction to the Nonprofit Sector	PAD 4144	3	
Quantitative Inquiry for Public Managers	PAD 4702	3	STA 2023
Research Methods for Public Management	PAD 4704	3	
RI: Research Methods in Political Science	POS 3703	3	
Public Opinion and American Politics	POS 4204	3	POS 2041 with minimum grade of "C"
Sociological Analysis: Quantitative Methods	SYA 4400	3	SYA 3010 and SYA 3300
Business Electives			

Course Name	Course Number	Credit	Prerequisites
Business Communication for Data Analysts	GEB 3231	3	Prerequisite or Corequisite: ISM 3116 with minimum grade of "C"
Revenue Management and Predictive Analytics in the Hospitality and Tourism Industry	HFT 4481	3	
Introduction to Business Analytics and Big Data	ISM 3116	3	ISM 3011 or ACG 4401
Contemporary Issues of Digital Data Management	ISM 4041	3	
Data Mining and Predictive Analytics	ISM 4117	3	
Database Management Systems	ISM 4212	3	ISM 3011 or ACG 4401
Management of Information Assurance and Security	ISM 4323	3	
Advanced Business Analytics	ISM 4403	3	ISM 3116
Social Media and Web Analytics	ISM 4420	3	
Business Analytics for Marketing and Customer Relationship Management	MAR 4615	3	MAR 3023 with minimum grade of "C" or permission of instructor
Engineering Electives			
Course Name	**Course Number**	**Credit**	**Prerequisites**
Introduction to Deep Learning	CAP 4613	3	COP 3530 or COP 3410 with minimum grade of "C" or permission of instructor
Introduction to Artificial Intelligence	CAP 4630	3	COP 3530 or COP 3410 with minimum grade of "C" or permission of instructor
Introduction to Data Mining and Machine Learning	CAP 4770	3	COP 3530 or COP 3410) and (EEE 4541 or STA 4821 or STA 2023 or equivalent) with minimum grades of "C"
Introduction to Data Science and Analytics	CAP 4773	3	(COP 2220 or COP 2034) and (EEE 4541 or STA 4821 or STA 2023) with minimum grades of "C" or permission of instructor
Introduction to Computer Systems Performance Evaluation	CEN 4400	3	COP 3014 and (EEE 4541 or STA 4821 or STA 2023 or equivalent)
Introduction to Database Structures	COP 3540	3	COP 3530 or COP 3410 with minimum grade of "C"
Introduction to Internet Computing	COP 3813	3	COP 3014 or COP 2034
Python Programming	COP 4045	3	COP 3530 or COP 3410 with minimum grade of "C"
Applied Database Systems	COP 4703	3	COP 3540 with minimum grade of "C"
Science Electives			
Course Name	**Course Number**	**Credit**	**Prerequisites**
Solar System Astronomy	AST 3110	3	AST 2002 and PHY 2053
Laboratory Methods in Biotechnology	BSC 4403L	3	MCB 3020, MCB 3020L, BCH 3033 and PCB 3063
Concepts in Bioinformatics	BSC 4434C	3	PCB 3063; open to students in Biology, Bioengineering, Science/Engineering and Computer Science
RI: Introduction to Data Science	CAP 3786	3	COP 2220 or MAD 2502
Cryptography and Information Security	CIS 4362	3	MAS 2103 and MAD 2502
Spatial Data Analysis	GEO 4167C	3	GEO 4022

Photogrammetry and Aerial Photograph Interpretation	GIS 4021C	3	
Applications of Geographic Information Systems	GIS 4048C	3	GIS 4043C or equivalent
Geospatial Databases	GIS 4118	3	GIS 4043C
Graph Theory	MAD 4301	3	MAD 2104 and MAS 2103
Applied Mathematical Modeling	MAP 4103	3	(MAP 2302 or MAP 3305) and (MAS 2103 or MAC 2313)
RI: Industrial Problems in Applied Math	MAP 4913	3	(MAP 2302 or MAP 3305) and (MAS 2103 or MAC 2313)
Epidemiology of Infectious Diseases	MCB 4276	3	
Topology for Data Science	MTG 4325	3	MAD 2104, MAS 2103 and (COP 2220 or MAD 2502)
Practical Cell Neuroscience	PCB 4843C	3	PCB 3063 with minimum grade of "B-"
Computational Physics	PHZ 3151C	3	MAC 2313, PHY 3101C
Mathematical Methods for Physics	PHZ 4113	3	MAP 3305
SAS for Data and Statistical Analyses	STA 3024	3	STA 2023 or equivalent
Computational Statistics	STA 3100	3	MAC 2311 and STA 2023 or higher
Introduction to Biostatistics	STA 3173	3	MAC 1105
Applied Statistics 1 Lab	STA 4202L	1	STA 4442; Corequisite: STA 4234
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Applied Statistics 2	STA 4702	3	STA 4234
Applied Time Series and Forecasting	STA 4853	3	STA 4234 or equivalent
Social Work and Criminal Justice Electives			
Course Name	**Course Number**	**Credit**	**Prerequisites**
Teen Technology Misuse	CCJ 4554	3	
Methods of Research in Criminal Justice	CCJ 4700	3	STA 2023
Criminal Justice Technology	CJE 3692C	3	
Crime Analysis	CJE 4663	3	
Computer Crime	CJE 4668	3	
Research Methods in Social Work	SOW 4403	3	SOW 3302