

Bachelor of Science with Major in Data Science and Analytics

(Minimum of 120 credits required)

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 Computer & Electrical Engineering and Computer Science (CEECS) 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 Design and Social Inquiry. The program aims to prepare students with the essential skill sets across disciplines needed for data-driven applications in industry, business, and government. To allow for maximum flexibility in career aspirations, students can select from four concentrations:

- Data Science in the Natural Sciences Concentration
- Data Science and Engineering Concentration
- Data Science in Business Concentration

Admission Requirements

All students must meet the minimum admission requirements of the University. Please refer to the [Admissions section](#) of this catalog.

Prerequisite Coursework for Transfer Students

Students transferring to Florida Atlantic University must complete lower-division requirements including the requirements of the Intellectual Foundations Program and College Algebra and Introductory Statistics. Lower-division requirements may be completed through the A.A. degree from any Florida public college, university, or community college or through equivalent coursework at another regionally accredited institution. Before transferring and to ensure timely progress toward the BSDS degree, students must also complete the prerequisite courses for their major as outlined in the [Transition Guides](#).

All courses not approved by the Florida Statewide Course Numbering System that will be used to satisfy requirements will be evaluated individually on the basis of content and will require a catalog course description and a copy of the syllabus for assessment.

Capstone – BS Data Science and Analytics

The Capstone for the BS degree with a 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 program to a real-world problem and will engage in processing data and applying appropriate analytic methods to the problem. Students will 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 the recommended three methods:

1. An approved PROJECT that will be evaluated by the following:
 - a. Ability to design, identify, and apply analytic methods to a specific problem
 - b. Ability to implement a solution using a suitable programming language and tools
 - c. Ability to measure and analyze the performance and robustness of the solution
 - d. Ability to write reports and present results
2. A RESEARCH experience which includes a minimum consecutive capstone course over two semesters working in a laboratory with the following deliverables describing the results of their research are required in the senior year.
 - a. Submission of a grant proposal is required no later than the second semester of the junior year.
 - b. Presentation of a poster or seminar at a local, regional, national or international research conference/symposium describing the results of the research is required in the senior year.
3. A THESIS experience which involves the direct research mentorship by an eligible faculty member with the deliverables describing the results of their research which is to be directly evaluated by the mentor and if needed, a thesis committee:
 - a. Written paper.
 - b. Seminar.

Degree Requirements:

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

1. 33 credits minimum of upper division coursework,
2. students must get a "C" or higher in all major courses to receive major credit, and
3. no major course can be taken pass/fail.

The 48 credits major requirements are listed below.

Common Core		
Introductory Statistics	STA 2023	3
Mathematics of Data Science	MAP 2190	3
Experimental Design and Data Analysis	CAP 2750	3
Tools for Data Science	CAP 2751	3
Data Management and Analysis with Excel	QMB 3302	3
Artificial Intelligence for Social Good	CCJ 3071	3
Data Science Capstone	ISC 4312	3
Common Core Credits:		21

Free Electives	
CHOOSE 2 COURSES FROM THE TABLE OF ELECTIVE COURSES FOR ALL CONCENTRATIONS	
Free Elective Credits:	6

Data Science in the Natural Sciences Concentration		
Concentration Core Requirements:		
Introduction to Computational Mathematics	MAD 2502	3
RI: Introduction to Data Science	CAP 3786	3
Computational Statistics	STA 3100	3
Concentration Core Credits:		9
Concentration Core Electives: CHOOSE 4 COURSES		
SAS for Data and Statistical Analyses	STA 3024	3
Probability and Statistics 1	STA 4442	3
Probability and Statistics 2	STA 4443	3
Applied Statistics 1 with Lab	STA 4234/4202L	3
Applied Statistics 2	STA 4702	3
Statistical Designs	STA 4222	3
Applied Time Series and Forecasting	STA 4853	3
Introduction to Biostatistics	STA 3173	3

RI: Industrial Problems in Applied Math	MAP 4913	3
Applied Mathematical Modeling	MAP 4103	3
Topology for Data Science	MTG 4328	3
Graph Theory	MAD 4301	3
Cryptography and Information Security	CIS 4362	3
Concentration Elective Credits:		12
Concentration Credits:		21

Data Science and Engineering Concentration		
Concentration Core Courses:		
Introduction to Programming in C, if applicable*	COP 2220	3
Foundations of Computer Science	COP 3014	3
Data Structures and Algorithm Analysis	COP 3530	3
Introduction to Data Science and Analytics	CAP 4773	3
Concentration Core Credits:		12
Concentration Elective Courses: CHOOSE 3 COURSES		
Introduction to Deep Learning	CAP 4613	3
Introduction to Artificial Intelligence	CAP 4630	3
Introduction to Data Mining and Machine Intelligence	CAP 4770	3
Introduction to Computer Systems Performance Evaluation	CEN 4400	3
Introduction to Database Structures	COP 3540	3
Applied Database Systems	COP 4703	3
Python Programming	COP 4045	3
Introduction to Internet Computing	COP 3813	3
Concentration Elective Credits:		9
Concentration Credits:		21

* Students that have taken a college-level introductory course in programming can substitute this course with one of the Concentration Elective Courses, with permission of the advisor.

Data Science in Business Concentration		
Concentration Core Requirements:		
Introduction to Business Analytics and Big Data	ISM 3116	3
Business Communication for Data Analysts	GEB 3231	3
Data Mining and Predictive Analytics	ISM 4117	3
Advanced Business Analytics	ISM 4403	3
Concentration Core Credits:		12
Concentration Core Electives: CHOOSE 3 COURSES		
Contemporary Issues of Digital Data Management	ISM 4041	3

Management of Information Assurance and Security	ISM 4323	3
Database Management Systems	ISM 4212	3
Social Media and Web Analytics	ISM 4420	3
Business Analytics for Marketing and Customer Relations	MAR 4615	3
Revenue Management and Predictive Analytics in the Hospitality and Tourism Industry	HFT 4881	3
Concentration Elective Credits:		9
Concentration Credits:		21

Table of Elective Courses for all Concentrations

Science Electives:		
Spatial Data Analysis	GEO 4167C	3
Photogrammetry and Aerial Photograph Interpretation	GIS 4021C	3
Applications of Geographic Information Systems	GIS 4048	3
Geospatial Databases	GIS 4118	3
Computational Physics	PHZ 3151C	3
Solar System Astronomy	AST 3110	3
Mathematical Methods in Physics	PHZ 4113	3
Practical Cell Neuroscience	PCB 4843C	3
Laboratory Methods in Biotechnology	BSC 4403L	3
Epidemiology of Infectious Diseases	MCB 4276	3
Concepts in Bioinformatics	BSC 4434C	3
RI: Introduction to Data Science	CAP 3786	3
Computational Statistics	STA 3100	3
SAS for Data and Statistical Analyses	STA 3024	3
Probability and Statistics 1	STA 4442	3
Probability and Statistics 2	STA 4443	3
Applied Statistics 1 with Lab	STA 4234/4234L	3
Applied Statistics 2	STA 4702	3
Statistical Designs	STA 4222	3
Applied Time Series and Forecasting	STA 4853	3
Introduction to Biostatistics	STA 3173	3
RI: Industrial Problems in Applied Math	MAP 4913	3
Applied Mathematical Modeling	MAP 4103	3
Topology for Data Science	MTG 4328	3
Graph Theory	MAD 4301	3
Cryptography and Information Security	CIS 4362	3
Engineering Electives:		
Introduction to Data Science and Analytics	CAP 4773	3
Introduction to Deep Learning	CAP 4613	3

Introduction to Artificial Intelligence	CAP 4630	3
Introduction to Data Mining and Machine Intelligence	CAP 4770	3
Introduction to Computer Systems Performance Evaluation	CEN 4400	3
Introduction to Database Structures	COP 3540	3
Applied Database Systems	COP 4703	3
Python Programming	COP 4045	3
Introduction to Internet Computing	COP 3813	3
Business Electives:		
Introduction to Business Analytics and Big Data	ISM 3116	3
Business Communication for Data Analysts	GEB 3231	3
Data Mining and Predictive Analytics	ISM 4117	3
Advanced Business Analytics	ISM 4403	3
Contemporary Issues of Digital Data Management	ISM 4041	3
Management of Information Assurance and Security	ISM 4323	3
Database Management Systems	ISM 4212	3
Social Media and Web Analytics	ISM 4420	3
Business Analytics for Marketing and Customer Relations	MAR 4615	3
Revenue Management and Predictive Analytics in the Hospitality and Tourism Industry	HFT 4881	3
Arts and Letters Electives:		
Research Methods	POS 3703	3
Public Opinion in America	POS 4202	3
Sociological Analysis Quantitative Methods	SYA 4400	3
Research Methods in Biological Archeology	ANT 4192	3
Information Technology in Public Administration	PAD 3712	3
Introduction to the Nonprofit Sector	PAD 4144	3
Research Methods for Public Management	PAD 4704	3
Quantitative Inquiry for Public Managers	PAD 4702	3
CDSI Electives:		
Criminal Justice Technology	CJE 3692C	3
Crime Analysis	CJE 4663	3
Computer Crime	CJE 4668	3
Teen Technology Misuse	CCJ 4554	3
Research Methods in Criminal Justice	CCJ 4700	3
Research Methods in Social Work	SOW 4403	3