FAU
FLORIDA ATLANTIC UNIVERSITY

NEW/CHANGE PROGRAM REQUEST
Undergraduate Programs

Department Mathematical Sciences

College Science

UUPC Approval 3-1-21
UFS Approval _____
Banner Posted _____
Catalog _____

Program Name
Bachelor of Science in Data Science and Analytics

☐ New Program
☑ Change Program

Effective Date (term/year)
Summer 2021

Please explain the requested change(s) and offer rationale below or on an attachment

This change clarifies that, consistent with university requirements, at least 45 upper division credits are necessary for the degree, and the term "free elective" is changed to " general elective for better clarity." Also, the Computer Science / Engineering concentration is being updated to allow students to choose whether to complete the concentration core with classes using C or with classes using Python.

The BSDSA degree committee discussed and approved these changes.

Faculty Contact/Email/Phone	**Consult and list departments that may be affected by the change(s) and attach documentation**
William Kalies / wkalies@fau.edu / 7-1107	CEECS/Engineering, ITOM/Business, Arts & Letters, CCJ / Social Work and Criminal Justice

Approved by		**Date**
Department Chair	*Stephen C Locke*	2/15/2021
College Curriculum Chair	*Jerry Haky*	2-15-21
College Dean		2-25-2021
UUPC Chair	*Jerry Haky*	3-2-21
Undergraduate Studies Dean	*Edward Pratt*	3-2-21
UFS President		
Provost		

Email this form and attachments to mjenning@fau.edu one week before the UUPC meeting so that materials may be viewed on the UUPC website prior to the meeting.

(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 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. To allow for maximum flexibility in career aspirations, students can select from three 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. 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, 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 BSDSA 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 - B.S. in Data Science and Analytics
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.

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 36 credits of free general electives. Additional requirements:

1. A minimum of 33 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 may be taken with a pass/fail grade.

The 48 required credits for the major are listed below.

Common Core		
Tools for Data Science	CAP 2751	3
Experimental Design and Data Analysis	CAP 2753	3

Artificial Intelligence for Social Good	CCJ 3071	3
Data Science Capstone	ISC 4941	3
Mathematics for Data Science	MAP 2192	3
Data Management and Analysis with Excel	QMB 3302	3
Introductory Statistics	STA 2023	3
Common Core Credits		**21**

~~Free~~ Electives	
Choose two courses from the List of Elective Courses for all Concentrations	
~~Free~~ Elective Credits	**6**

Data Science in the Natural Sciences Concentration

Concentration Core Requirements		
RI: Introduction to Data Science	CAP 3786	3
Introduction to Computational Mathematics	MAD 2502	3
Computational Statistics	STA 3100	3
Concentration Core Credits		*9*
Concentration Core Electives. Choose four courses.		
Cryptography and Information Security	CIS 4362	3
Graph Theory	MAD 4301	3
Applied Mathematical Modeling	MAP 4103	3
RI: Industrial Problems in Applied Math	MAP 4913	3
Topology for Data Science	MTG 4325	3
SAS for Data and Statistical Analyses	STA 3024	3
Introduction to Biostatistics	STA 3173	3
Applied Statistics 1 Lab	STA 4202L	1
Statistical Designs	STA 4222	3
Applied Statistics 1	STA 4234	2
Probability and Statistics 1	STA 4442	3
Probability and Statistics 2	STA 4443	3
Applied Statistics 2	STA 4702	3
Applied Time Series and Forecasting	STA 4853	3
Concentration Elective Credits		*12*
Concentration Credits		**21**

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Data Science and Engineering Concentration

Concentration Core Requirements		
Introduction to Data Science and Analytics	CAP 4773	3
Take all courses from either Group 1 or Group 2.		
Group 1:		
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
Group 2:		
Introduction to Programming in Python	COP 2034	3
Data Structures and Algorithm Analysis with Python	COP 3410	3
Concentration Core Credits		9 -12
Concentration Core Electives. Choose three or four courses such that the total concentration credits is 21.		
Introduction to Deep Learning	CAP 4613	3
Introduction to Artificial Intelligence	CAP 4630	3
Introduction to Data Mining and Machine Learning	CAP 4770	3
Introduction to Computer Systems Performance Evaluation	CEN 4400	3
Introduction to Database Structures	COP 3540	3
Introduction to Internet Computing	COP 3813	3
Python Programming	COP 4045	3
Applied Database Systems	COP 4703	3
Concentration Elective Credits		9-12
Concentration Credits		21

*Students who have taken a college-level introductory course in programming may 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 Data Science and Analytics	CAP 4773	3
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
Concentration Core Credits		12
Concentration Core Electives. Choose three courses.		

Revenue Management and Predictive Analysis in the Hospitality and Tourism Industry	HFT 4481	3
Contemporary Issues of Digital Data Management	ISM 4041	3
Database Management Systems	ISM 4212	3
Management of Information Assurance and Security	ISM 4323	3
Social Media and Web Analytics	ISM 4420	3
Business Analytics for Marketing and Customer Relationship Management	MAR 4615	3
Concentration Elective Credits		*9*
Concentration Credits		**21**

Electives Table

Arts and Letters Electives		
Research Methods in Bioarchaeology	ANT 4192	3
Information Technology in Public Administration	PAD 3712	3
Introduction to the Nonprofit Sector	PAD 4144	3
Quantitative Inquiry for Public Managers	PAD 4702	3
Research Methods for Public Management	PAD 4704	3
RI: Research Methods in Political Science	POS 3703	3
Public Opinion in American Politics	POS 4204	3
Sociological Analysis: Quantitative Methods	SYA 4400	3
Business Electives		
Business Communication for Data Analysts	GEB 3231	3
Revenue Management and Predictive Analysis in the Hospitality and Tourism Industry	HFT 4481	3
Introduction to Business Analytics and Big Data	ISM 3116	3
Contemporary Issues of Digital Data Management	ISM 4041	3
Data Mining and Predictive Analytics	ISM 4117	3
Database Management Systems	ISM 4212	3
Management of Information Assurance and Security	ISM 4323	3
Advanced Business Analytics	ISM 4403	3
Social Media and Web Analytics	ISM 4420	3
Business Analytics for Marketing and Customer Relationship Management	MAR 4615	3
Engineering Electives		
Introduction to Deep Learning	CAP 4613	3
Introduction to Artificial Intelligence	CAP 4630	3
Introduction to Data Mining and Machine Learning	CAP 4770	3
Introduction to Data Science and Analytics	CAP 4773	3

Introduction to Computer Systems Performance Evaluation	CEN 4400	3
Introduction to Database Structures	COP 3540	3
Introduction to Internet Computing	COP 3813	3
Python Programming	COP 4045	3
Applied Database Systems	COP 4703	3
Science Electives		
Solar System Astronomy	AST 3110	3
Laboratory Methods in Biotechnology	BSC 4403L	3
Concepts in Bioinformatics	BSC 4434C	3
RI: Introduction to Data Science	CAP 3786	3
Cryptography and Information Security	CIS 4362	3
Spatial Data Analysis	GEO 4167C	3
Photogrammetry and Aerial Photograph Interpretation	GIS 4021C	3
Applications of Geographic Information Systems	GIS 4048C	3
Geospatial Databases	GIS 4118	3
Graph Theory	MAD 4301	3
Applied Mathematical Modeling	MAP 4103	3
RI: Industrial Problems in Applied Math	MAP 4913	3
Epidemiology of Infectious Diseases	MCB 4276	3
Topology for Data Science	MTG 4325	3
Practical Cell Neuroscience	PCB 4843C	3
Computational Physics	PHZ 3151C	3
Mathematical Methods for Physics	PHZ 4113	3
SAS for Data and Statistical Analyses	STA 3024	3
Computational Statistics	STA 3100	3
Introduction to Biostatistics	STA 3173	3
Applied Statistics 1 Lab	STA 4202L	1
Statistical Designs	STA 4222	3
Applied Statistics 1	STA 4234	2

Probability and Statistics 1	STA 4442	3
Probability and Statistics 2	STA 4443	3
Applied Statistics 2	STA 4702	3
Applied Time Series and Forecasting	STA 4853	3
Social Work and Criminal Justice Electives		
Teen Technology Misuse	CCJ 4554	3
Methods of Research in Criminal Justice	CCJ 4700	3
Criminal Justice Technology	CJE 3692C	3
Crime Analysis	CJE 4663	3
Computer Crime	CJE 4668	3
Research Methods in Social Work	SOW 4403	3