College of Integrative Studies

Under Construction

Bachelor of Science in Data Science

The Bachelor of Science in Data Science is an interdisciplinary program that draws upon disciplines from multiple colleges. It is a 123-hour inter-college program designed to include three general areas of coursework: general education, program core, and applications of the data science fundamentals in specific body of knowledge such as geoinformatics, computational intelligence and cybersecurity, marketing, management information systems, statistical modeling, social science analytics, architectural design and built environment, and smart agriculture. The overall curriculum is designed to provide students with an ideal educational experience necessary to become effective professional data science experts. Under the proposed undergraduate curriculum, general education coursework will help data science students develop intellectual curiosity, critical thinking, and ethical and aesthetic awareness. The coursework for the core program will provide students with the opportunity to build a strong foundation in the key fields of data science that include computer science, mathematics and statistics, management information systems, communication, management/leadership, design, and ethics. The course sequences for several distinct areas of academic concentration will provide students with the opportunity to become data science experts in a specific area. Students must earn a grade of C or higher in the two-semester senior capstone courses included in each of the concentrations.

General Education Requirements

English Composition		
EN 1103	English Composition I	3-4
or EN 1104	Expanded English Composition I	
EN 1113	English Composition II	3
or EN 1173	Accelerated Composition II	
Creative Discovery		
Any Gen Ed course		3
Humanities		
PHI 1113	Introduction to Logic	3
Any additional Gen Ed course		3
Social/Behavioral Sciences		
DSCI 2013	Data Science Literacy	3
Any additional Gen Ed course		3
Quantitative Reasoning		
MA 1713	Calculus I	3
Natural Sciences		
2 lab based sciences required by Gen Ed		6

Major Core

Oral Communication		
CO 3213	Small Group Communication	3
Technical Writing		
CO 3223	Communication & Media Research Methods	3
Major Core		
MA 1723	Calculus II	3
MA 2733	Calculus III	3
MA 3123	Introduction to Statistical Inference	3
MA 3113	Introduction to Linear Algebra	3
MA 4523	Introduction to Probability	3
or ST 4523	Introduction to Probability	
CSE 1284	Introduction to Computer Programming	0,4
CSE 1384	Intermediate Computer Programming	4
CSE 2813	Discrete Structures	3
CSE 2383	Data Structures and Analysis of Algorithms	3
CSE 3763	Ethical and Legal Issues in Computing	3

CSE 4503	Database Management Systems	3
CSE 4633	Artificial Intelligence	3
BIS 3233	Management Information Systems	3
DSCI 2012	Data Science Lab: Data Wrangling	2
DSCI 2022	Data Science Lab: Cloud, High-Performance, and Quantum Computing	2
DSCI 3012	Data Science Lab: Description, Analysis, and Inference	2
DSCI 3013	Fundamentals of Data Acquisition	3
DSCI 3022	Data Science Lab: Data Visualization	2
DSCI 3032	Data Science Lab: Artificial Intelligence	2
DSCI 4013	Data Visualization	3
Concentration Courses		30
Total Hours		**123**

Choose a Concentration:

Each area of concentration combines fundamental, field-specific content, concentration electives designed to apply data science to the field, and a six-hour practicum/capstone project. On their third year, students will have the opportunity to select a concentration area from the several available areas offered by the different college on campus.

Visualization and Visual Analytics for Built Environment Concentration

Fundamental Discipline Courses		
Complete 8 of the following:		24
ART 1123	Design I	
ART 2803	Digital Design I	
ART 2813	Digital Design II	
ART 4813	Interactive Design II	
BCS 2313	Virtual Design and Construction	
ID 3603	Digital Design for Interiors	
ID 3363	3/D CAD/Modeling	
ARC 2713	Environmental Building Systems I	
ARC 3723	Environmental Building Systems II	
ARC 4633	Architecture and Virtual Spaces	
Capstone		
DSCI 4553	Data Science Capstone 1	3
DSCI 4663	Data Science Capstone 2	3

Computational Agriculture and Natural Resources Concentration

Fundamental Discipline Courses		
Choose 1 course from the following:		3
AEC 2713	Introduction to Food and Resource Economics	
ABE 1863	Engineering Technology in Agriculture	
BCH 4013	Principles of Biochemistry	
PSS 1313	Plant Science	
ADS 1113	Animal Science	
Choose 1 course from the following:		3
SBP 1103	Introduction to Sustainable Bioproducts	
WFA 3133	Applied Ecology	
FO 4123	Forest Ecology	
Core Concentration Courses		
Choose 6 hours from the following:		6
CALS		
EC 2113	Principles of Macroeconomics	
EC 3123	Intermediate Microeconomics	

AEC 2223	Introduction to Sustainability Economics	
AEC 3133	Introductory Agribusiness Management	
AEC 3233	Introduction to Environmental Economics and Policy	
AEC 4123	Financial and Commodity Futures Marketing	
ABE 2173	Principles of Agricultural and Off-Road Machines	
ABE 2543	Precision Agriculture I	
ABE 4543	Precision Agriculture II	
BCH 3102	Essential Biochemical Concepts and Analysis	
BCH 4414	Protein Methods	
ADS 3013	Anatomy and Physiology	
ADS 3313	Introduction to Meat Science	
CFR		
SBP 2012	Introduction to Bioproduct Industries	
SBP 2123	Materials and Processing of Structural Bioproducts	
WFA 4313	Fisheries Management	
WFA 4613	Landscape Ecology	
FO 2213	Forest Measurements	
FO 2443	Essentials of Biotechnology	
FO 4113	Forest Resource Economics	
FO 4123	Forest Ecology	
Applied Courses		
Choose 12 hours from the following:		12
CALS		
AEC 4133	Analysis of Food Markets and Prices	
AEC 4223	Applied Quantitative Analysis in Agricultural Economics	
AEC 4363	Economics of Precision Agriculture	
AEC 4413	Public Problems of Agriculture	
AEC 4733	Econometric Analysis in Agriculture Economics	
ABE 2873	Land Surveying	
ABE 3513	The Global Positional System and Geographic Information Systems in Agriculture and Engineering	
ABE 4163	Agricultural and Off-Road Machinery Management	
ABE 4263	Soil and Water Management	
ABE 4463	Introduction to Imaging in Biological Systems	
ABE 4483	Introduction to Remote Sensing Technologies	
BCH 4803	Integrative Protein Evolution	
PSS 4483	Introduction to Remote Sensing Technologies	
ADS 4523	Internet-Based Management in Livestock Industries	
CFR		
SBP 4013	Wood Anatomy	
SBP 4253	Quantitative Methods in Sustainable Bioproducts	
WFA 4123	Wildlife & Fisheries Biometrics	
WFA 4243	Wildlife Techniques	
WFA 4253	Application of Spatial Technologies to Wildlife and Fisheries Management	
FO 3015	Forest Description and Analysis	
FO 4213	Forest Biometrics	
FO 4313	Spatial Technologies in Natural Resources Management	
FO 4453	Remote Sensing Applications	
FO 4473	GIS for Natural Resource Management	
Capstone		
DSCI 4553	Data Science Capstone 1	3
DSCI 4663	Data Science Capstone 2	3

Business Information Systems Concentration

Fundamental Discipline Courses		
Choose 2 courses from the following:		6
BL 2413	The Legal Environment of Business	
ACC 2013	Principles of Financial Accounting	
ACC 2023	Principles of Managerial Accounting	
EC 2113	Principles of Macroeconomics	
EC 2123	Principles of Microeconomics	
FIN 3123	Financial Management	
MGT 3113	Principles of Management	
MKT 3013	Principles of Marketing	
MKT 3323	International Logistics	
Core Concentration Courses		
BQA 4423	Business Decision Analysis	3
BIS 4533	Decision Support Systems	3
BIS 4113	Business Information Systems Security Management	3
BIS 4753	Structured Systems Analysis and Design	3
4000-level business course		3
Non-business course from any of the data science concentrations		3
Capstone		
BIS 4763	BIS Senior Seminar	3
BQA 4413	Business Forecasting and Predictive Analytics	3

Marketing and Supply Chain Concentration

Fundamental Discipline Courses		
MKT 3013	Principles of Marketing	3
SCL 3323	International Logistics	3
Choose 1 course from the following:		3
BL 2413	The Legal Environment of Business	
ACC 2013	Principles of Financial Accounting	
ACC 2023	Principles of Managerial Accounting	
EC 2113	Principles of Macroeconomics	
EC 2123	Principles of Microeconomics	
FIN 3123	Financial Management	
MGT 3113	Principles of Management	
Core Concentration Courses [1]		
Choose 4 courses from the following:		12
BIS 4533	Decision Support Systems	
MKT 3213	Retailing	
MKT 4213	AI-Driven Digital Marketing	
MKT 4223	Social Media Marketing	
MKT 4413	Consumer Behavior	
MKT 4533	Marketing Research	
MKT 4913	Live Case Course in Marketing	
SCL 4013	Procurement	
SCL 4033	International Transportation	
SCL 4313	Physical Distribution Management	
SCL 4333	Supply Chain Process Analysis	
SCL 4913	Live Case Course in Supply Chain Logistics	
Students will register for one non-business course for which they meet the prerequisites from any of the data science concentrations.		
Capstone		
Choose 2 from the following:		

BQA 4413	Business Forecasting and Predictive Analytics
BQA 4423	Business Decision Analysis
BQA 4000	Directed Individual Study in Business Quantitative Analysis

[1] Students can replace up to two core concentration courses with 3000- or 4000-level MKT or SCL courses not listed above with the consent of their advisor.

Social Data Analytics Concentration

Fundamental Discipline Courses		
Choose 9 hours from the following (but no more than 6 hours in any one field):		9
AN 1103	Anthropology: A Window on Humanity	
AN 1143	Cultural Anthropology: Global Forces, Local Lives	
AN 1344	Biological Anthropology: The Making of Us	
CO 1403	Introduction to the Mass Media	
GR 2313	Maps and Remote Sensing	
PS 1313	Introduction to International Relations	
PS 1513	Comparative Government	
PS 2703	Introduction to Public Policy	
CRM 1003	Crime and Justice in America	
SO 1003	Introduction to Sociology	
SO 1103	Contemporary Social Problems	
Core Concentration Courses		
Choose 15 hours from the following:		15
AN 3343	Introduction to Criminalistics	
AN 4163	Anthropology of International Development	
AN 4173	Environment and Society	
AN 4323	Plagues and People	
CO 4213	Political Communication	
CO 4283	Health Communication	
CRM 4253	White Collar and Computer Crime	
GR 3303	Survey of Geospatial Technologies	
GR 4123	Urban Geography	
PS 4243	State Election Policy and Politics	
PS 4283	Public Opinion	
PS 4293	Political Behavior	
PS 4343	International Conflict and Security	
PS 4373	International Terrorism	
PS 4464	Political Analysis	
PS 4523	Democracy and Inequality	
PS 4613	Civil Wars and Intra-State Conflicts	
SO 3303	Rural Sociology	
SO 4113	Social Organization and Change	
SO 4123	Poverty, Analysis: People, Organization and Program	
SO 4173	Environment and Society	
Capstone		
DSCI 4553	Data Science Capstone 1	3
DSCI 4663	Data Science Capstone 2	3

Psychoinformatics Concentration

Fundamental Discipline Courses		
PSY 1021	Careers in Psychology	1
PSY 3104	Introductory Psychological Statistics	0,4

PSY 3314	Experimental Psychology	0,4
Core Concentration Courses		
Choose 9 hours from the following:		9
PSY 3343	Psychology of Learning	
PSY 3623	Social Psychology	
PSY 3713	Cognitive Psychology	
PSY 3803	Introduction to Developmental Psychology	
PSY 4403	Biological Psychology	
6 hours of 4000-level PSY courses		6
Capstone		
PSY 4000	Directed Individual Study in Psychology	6

Statistical Modeling Concentration

Core Concentration Courses		
Choose 24 hours from the following:		24
MA 2923	Introduction to Modern Scientific Computing	
MA 4133	Discrete Mathematics	
MA 4143	Graph Theory	
MA 4183	Mathematical Foundations of Machine Learning	
ST 4213	Nonparametric Methods	
ST 4243	Data Analysis I	
ST 4313	Introduction to Spatial Statistics	
ST 4543	Introduction to Mathematical Statistics I	
Capstone		
DSCI 4553	Data Science Capstone 1	3
DSCI 4663	Data Science Capstone 2	3

Computational Intelligence Concentration

Core Concentration Courses		
CSE 2213	Methods and Tools in Software Development	3
CSE 3183	Systems Programming	3
CSE 4293	AI for Cybersecurity	3
CSE 4623	Computational Biology	3
CSE 4643	AI Robotics	3
CSE 4653	Cognitive Science	3
CSE 4683	Machine Learning and Soft Computing	3
CSE 4833	Introduction to Analysis of Algorithms	3
Capstone		
DSCI 4553	Data Science Capstone 1	3
DSCI 4663	Data Science Capstone 2	3

Geoinformatics Concentration

Fundamental Discipline Courses		
GR 4303	Principles of GIS	0,3
GR 4633	Statistical Climatology	0,3
Choose 1 of the following:		3
GR 4333	Remote Sensing of the Physical Environment	
GR 4783	Satellite Meteorology	
GR 4883	Radar Meteorology	
Core Concentration Courses		
Choose 15 hours from the following:		15
GR 4123	Urban Geography	

GR 4313	Advanced GIS [2]	
GR 4323	Cartographic Sciences [2]	
GR 4333	Remote Sensing of the Physical Environment [1, 2]	
GR 4343	Advanced Remote Sensing in Geosciences [2]	
GR 4363	Geographic Information Systems Programming [2]	
GR 4553	Computer Methods in Meteorology	
GR 4613	Applied Climatology	
GR 4643	Physical Meteorology and Climatology I	
GR 4693	Physical Meteorology and Climatology II	
GR 4733	Synoptic Meteorology	
GR 4783	Satellite Meteorology [1]	
GR 4883	Radar Meteorology [1]	
GG 3613	Water Resources	
GG 4233	Applied Geophysics	
GG 4503	Geomorphology	
GG 4523	Coastal Environments	
GG 4543	Community Engagement in Environmental Geosciences	
GG 4613	Physical Hydrogeology	
Capstone		
DSCI 4553	Data Science Capstone 1	3
DSCI 4663	Data Science Capstone 2	3

1 Can be used as remaining hours if not already used for the required concentration.
2 Counts towards the Geospatial and Remote Sensing Minor

Sports Science Concentration

BIO 1004	Anatomy and Physiology [1]	0,4
EP 3233	Anatomical Kinesiology	3
EP 3304	Exercise Physiology	0,4
EP 4504	Mechanical Analysis of Movement	0,4
Human Performance Emphasis		3
Choose one of the following;		
PE 3163	Sport Psychology	
SS 4003	Philosophy of Sport & Physical Activity	
Core Concentration Courses		
PE 4283	Sport Biomechanics	3
PE 3313	Sport Physiology	3
EP 4153	Training Techniques for Exercise and Sport [2]	3
DSCI 4663	Data Science Capstone 2	3

1 If taken as a general education credit, an additional Sports Science course will be added.
2 Serves as requirement for DSCI 4553

Biomedical Informatics Concentration

Required Courses		
ABE 4633	Biomedical Signal and Sensors	3
ABE 4463	Introduction to Imaging in Biological Systems	3
BCH 4443	Introduction to Public Health	3
ABE 4323	Physiological Systems in Biomedical Engineering	3
DSCI 4553	Data Science Capstone 1	3
DSCI 4663	Data Science Capstone 2	3
Biomedical Modeling		

Choose 1 of the following:		3-4
CSE 4683	Machine Learning and Soft Computing	
CSE 4623	Computational Biology	
MA 4343	Mathematical Modeling with Biological and Ecological Applications	
BIO 4124	Mathematical Modeling in Ecology and Evolution	
Biomedical Systems and Diagnostics		
Choose 1 of the following:		2-3
ABE 4443	Spectroscopic Sensing in Biological Systems	
EP 3613	Exercise Electrocardiography	
ABE 1912	Computational Problem Solving for Biological Systems	
Biomedicine and Health Applications		
Choose 2 of the following:		6
FNH 3103	Introduction to Health Professions	
CSE/PSY 4653	Cognitive Science	
BCH 2013	Introduction to Forensic Science	
BCH 4113	Essentials of Molecular Genetics	

Quantum Computing

Required Courses		
PH 1001	Introduction to Physics	1
PH 2213	Physics I	3
PH 3613	Modern Physics	3
MA 2743	Calculus IV	3
MA 3253	Differential Equations I	3
PH 4713	Introduction to Quantum Mechanics	3
PH 4163	Foundations of Quantum Computing	3
DSCI 4553	Data Science Capstone 1	3
DSCI 4663	Data Science Capstone 2	3
Students will then choose from 2 pathways.		
Pathway 1:		
Required Courses:		
PH 4152	Modern Physics Laboratory	2
PH 4143	Intermediate Laboratory	3
Pathway 2:		
Choose two courses from the list below:		6
PH 3063	Astrophysics	
PH 4413	Thermal Physics	
PH 4813	Introduction to Solid State Physics	
PH 4323	Electromagnetic Fields I	
PH 4213	Intermediate Mechanics I	
PH 4113	Electronic Circuits for Scientists	
PH 4433	Computational Physics	
PH 4513	Intermediate Optics	
PH 4613	Nuclear and Particle Physics	
PH 1063	Descriptive Astronomy	
PH 4723	Applications of Quantum Mechanics	
PH 4990	Special Topics in Physics and Astronomy	

Tourism and Destination Development Minor

The Minor in Tourism and Destination Development (TOUR) is an interdisciplinary program designed to develop future leaders in the tourism and service sector industries. Integrating expertise from multiple colleges, the minor offers a broad understanding of visitor experience design, destination operations, and tourism development. Students will gain essential skills relevant to the tourism industry, including visitor management, community

tourism development, and digital marketing, with a unique focus on attracting, engaging, and meeting the needs of travelers while building community economies.