DATA SCIENCE B.S.

All students must meet the University Requirements. (http://catalogue.uvm.edu/undergraduate/academicinfo/degreerequirements/)

DATA SCIENCE MAJOR

The study and applications of Data Science impacts our lives in myriad ways every moment of every day. Often times we are unaware of the role this important field plays in our daily routines. We have data scientists to thank as we read the latest news on our social media feed of choice, or watch a movie suggested by our go-to streaming app. Even the food we eat has likely been guided by the study of big data. For example, researchers are working hand-in-hand with farms of all sizes to help analyze data which in turn can identify and reduce areas of inefficiency and waste, and bring food to your table in a faster, safer, and more cost-effective way.

The curriculum of the Bachelor of Science with a major in Data Science combines courses from the disciplines of Statistics, Mathematics, and Computer Science to prepare students for careers in Big Data Science & Analytics: rapidly growing fields with huge unmet demand. The unique interdisciplinary educational experience allows students the opportunity to acquire the broad base of knowledge and skills that employers are seeking.

REGULATIONS

Students pursuing the Bachelor of Science degree with a major in Data Science are subject to the Academic Standards in CEMS outlined in this catalogue.

REQUIREMENTS

THE CURRICULUM FOR THE B.S. IN DATA SCIENCE

A minimum of 120 credits is required. Students must satisfy all University requirements.

CORE (6 CREDITS):		
CEMS 050	CEMS First Year Seminar	1
CS 064	QR: Discrete Structures	3
or MATH 052	QR:Fundamentals of Mathematics	
STAT 151	QR: Applied Probability	3
or STAT 251	QR: Probability Theory	
COMPUTER SCIENCE CORE (19 CREDITS):		
CS 021	QR: Computer Programming I	3
CS 110	QR: Intermediate Programming	4
CS 124	QR: Data Struc & Algorithms	3
CS 204	QR: Database Systems	3
CS 224	QR:Algorithm Design & Analysis	3
100-Level (or above) CS Elective [1]		3
STATISTICS CORE (24 CREDITS):		
STAT 087	QR: Intro to Data Science	3
STAT 141	QR:Basic Statistical Methods 1	3
or STAT 143	QR: Statistics for Engineering	
or STAT 211	QR: Statistical Methods I	
STAT 201	QR:Stat Computing&Data Anlysis	3
STAT 221	QR: Statistical Methods II	3
STAT 229	QR:Survivl/Logistic Regression	3
STAT 281	Capstone Experience	1-18
or STAT 293	Undergrad Honors Thesis	
or MATH 293	Undergraduate Honors Thesis	
or CS 283	Undergraduate Honors Thesis	
STAT/CS 287	QR: Data Science I	3
STAT 288	QR: Statistical Learning	3
MATHEMATICS CORE (17 CREDITS):		
MATH 021	QR: Calculus I	4
MATH 022	QR: Calculus II	4
MATH 122	QR: Applied Linear Algebra	3
or MATH 124	QR: Linear Algebra	
Choose 6 credits in Mathematics electives at the 100-Level (or above) [1]		6
Choose 12 Credits in Data Science (DS) electives selected from the list of approved courses (see below) in MATH/STAT/CS/CSYS/NR, with at least 9 of these credits at the 200-level (or above): [2]		12
CS 120	QR: Advanced Programming	
CS 148	QR: Database Design for Web	
CS 166	QR: Cybersecurity Principles	
CS 167	Cybersecurity Defense	
CS 205	QR: Software Engineering	
CS 224	QR:Algorithm Design & Analysis	
CS 228	QR: Human-Computer Interaction	
CS 254	QR: Machine Learning	
CS/CSYS 302	Modeling Complex Systems [3]	
CS/CSYS 352	Evolutionary Computation [3]	

MATH 121	QR: Calculus III	
MATH 173	QR: Basic Combinatorial Theory	
MATH 235	QR:Mathematical Models&Anlysis	
MATH/CS 237	QR:Intro to Numerical Analysis	
MATH 266	QR:Chaos,Fractals&Dynmcal Syst	
MATH 268	QR:Mathematical Biology&Ecol	
MATH/CSYS 300	Principles of Complex Systems [3]	
MATH/CSYS 303	Complex Networks [3]	
STAT 183	QR:Basic Statistical Methods 2	
STAT 224	QR:Stats for Qualty&Productvty	
STAT 231	QR: Experimental Design	
STAT 235	QR: Categorical Data Analysis	
STAT 241	QR: Statistical Inference	
STAT/CS 288	QR: Statistical Learning	
STAT 330	Bayesian Statistics [3]	
STAT 387	Data Science II [3]	
NR 143	Intro to Geog Info Systems	
CE 359	Appld Artificial Neural Ntwrks [3]	
CE/CSYS/ STAT 369	Applied Geostatistics [3]	
CHOOSE ONE 2-COURSE NATURAL SCIENCE (W/ LAB) SEQUENCE:		8
BIOL 001 & BIOL 002	Principles of Biology and Principles of Biology	
CHEM 031 & CHEM 032	General Chemistry 1 and General Chemistry 2	
PHYS 051 & PHYS 152	Fundamentals of Physics I and Fundamentals of Physics II	

1 Students should select appropriate courses from list of approved Data Science (DS) electives. Alternative courses may be approved by the DS Curriculum Committee.

2 Additional courses, including special topics courses, may be granted approval if appropriate (consult advisor)

3 Undergraduate students require instructor permission to enroll in 300-level courses.

4 Students are required to complete a minimum of 3 cr. Humanities and 3 cr. Social Sciences and 3 cr. Professional Development Electives.

GRADUATE

Complex Systems and Data Science AMP

Complex Systems and Data Science M.S.

Complex Systems and Data Science Ph.D.

See the online Graduate Catalogue (http://catalogue.uvm.edu/graduate/) for more information