

DATA SCIENCE AND ENGINEERING (BS)

The Data Science and Engineering Data Science major provides students with the knowledge and skills throughout the data science lifecycle. It covers the topics of data structure, discrete systems, algorithms and complexity, database systems, data ethics, big data analytics, and machine learning. Students will learn advanced data science courses with applications in various scientific and engineering domains. They will be able to apply what they learn to many data science application areas including manufacturing, pharmaceutical science, biomedical engineering, aerospace, and chemical and material engineering, and many other emerging areas.

Data Science and Engineering majors are required to complete the following Computer Science and Engineering (CSE) courses:

Course	Title	Credits
CSE 1010	Introduction to Computing for Engineers	3
CSE 2050	Data Structures and Object-Oriented Design	3
CSE 2500	Introduction to Discrete Systems	3
CSE 2600	Introduction to Data Science and Engineering	3
CSE 3000	Contemporary Issues in Computer Science and Engineering	1
CSE 3140	Cybersecurity Lab	2
CSE 3500	Algorithms and Complexity	3
CSE 4502	Big Data Analytics	3
CSE 4701	Principles of Databases	3
CSE 4820	Introduction to Machine Learning	3
CSE 4939W	Computer Science and Engineering Design Project I	3
CSE 4940	Computer Science and Engineering Design Project II	3

All Data Science and Engineering majors must also complete the following:

Course	Title	Credits
MATH 2110Q	Multivariable Calculus	4
MATH 2210Q	Applied Linear Algebra	3

Select one of the following:

MATH 3160	Probability	
STAT 3025Q	Statistical Methods	
STAT 3345Q	Probability Models for Engineers	
STAT 3375Q	Introduction to Mathematical Statistics I	

Select one two-semester laboratory course sequence from either chemistry or physics

CHEM 1127Q	General Chemistry I	4
CHEM 1128Q	General Chemistry II	
CHEM 1137Q		4
CHEM 1138Q		
CHEM 1147Q	Honors General Chemistry I	4
CHEM 1148Q	Honors General Chemistry II	
PHYS 1401Q	General Physics with Calculus I	4

PHYS 1402Q	General Physics with Calculus II	
PHYS 1501Q	Physics for Engineers I	4
PHYS 1502Q	Physics for Engineers II	
PHYS 1601Q	Fundamentals of Physics I	4
PHYS 1602Q	Fundamentals of Physics II	

Select one additional science course from the following list (but not in the same department as the two-semester sequence)

BIOL 1107	Principles of Biology I	4
BIOL 1108	Principles of Biology II	4
BIOL 1110	Introduction to Botany	4
CHEM 1127Q	General Chemistry I	4
CHEM 1128Q	General Chemistry II	4
PHYS 1401Q	General Physics with Calculus I	4
PHYS 1402Q	General Physics with Calculus II	4
PHYS 1502Q	Physics for Engineers II	4
PHYS 1601Q	Fundamentals of Physics I	4
PHYS 1602Q	Fundamentals of Physics II	4
ERTH 1050	Earth's Dynamic Environment	4
or ERTH 1051	Earth's Dynamic Environment (Lecture)	
ERTH 1052	Earth's Dynamic Environment (Laboratory)	

Select a minimum of four courses totaling a minimum of 12 credits from the following list

CSE 2102	Introduction to Software Engineering	3
CSE 3250	Introduction to Cloud Computing	3
CSE 3400	Introduction to Computer and Network Security	3
or CSE 5850	Introduction to Cyber-Security	
CSE 3800	Bioinformatics	3
or CSE 5800	Bioinformatics	
CSE 3802	Numerical Methods in Scientific Computation	3
or ECE 3431	Numerical Methods in Scientific Computation	
CSE 4705	Artificial Intelligence	3
CSE 4830	Computer Vision and Machine Learning for Image Analysis	3
CSE 5520	Data Visualization and Communication	3
CSE 5713	Data Mining	3
CSE 5820	Machine Learning	3
BME 4810	Machine Learning Methods for Biomedical Signal Analysis	3
ECE 4131	Introduction to Digital Signal Processing	3
ECE 4132	Image Processing Systems Laboratory	3
STAT 3965	Elementary Stochastic Processes	3
or MATH 3170	Elementary Stochastic Processes	

Students select additional elective courses to reach a minimum of 120 credits.

Further details and course sequences are given in the Data Science and Engineering (<https://www.cse.uconn.edu/undergraduate/major-programs/data-science-engineering/>) Guide to Course Selection.