Data Science (BS)

The Data Science BS is jointly offered by the Department of Mathematical Sciences in the School of Natural Sciences and Mathematics and the Department of Computer Science in the Erik Jonsson School of Engineering and Computer Science. Data Science is an emerging discipline that lies at the intersection of Computer Science, Mathematics, and Statistics. The curriculum for the program provides a solid foundation in all the three disciplines. It prepares students for Data Scientist or related positions in industry, business, and government that are currently in high demand and also for graduate study in either of the three disciplines. The curriculum also includes a capstone project course.

Bachelor of Science in Data Science

Degree Requirements (120 semester credit hours)\(^1\)

NSM Faculty

ECS Faculty

I. Core Curriculum Requirements: 42 semester credit hours\(^2\)

**Communication: 6 semester credit hours**

RHET 1302 Rhetoric

Select any 3 semester credit hours from Communications option (see advisor)

**Mathematics: 3 semester credit hours**

MATH 2417 Calculus I\(^3, 4\)

**Life and Physical Sciences: 6 semester credit hours\(^3, 5\)**

PHYS 2325 Mechanics

or PHYS 2421 Honors Physics I - Mechanics and Heat

PHYS 2326 Electromagnetism and Waves

or PHYS 2422 Honors Physics II - Electromagnetism and Waves

**Language, Philosophy and Culture: 3 semester credit hours**

Select any 3 semester credit hours from Language, Philosophy and Culture core courses (see advisor)

**Creative Arts: 3 semester credit hours**

Select any 3 semester credit hours from Creative Arts core courses (see advisor)
American History: 6 semester credit hours
Select any 6 semester credit hours from American history core courses (see advisor)

Government/Political Science: 6 semester credit hours
GOVT 2305 American National Government
GOVT 2306 State and Local Government

Social and Behavioral Sciences: 3 semester credit hours
Select any 3 semester credit hours from Social and Behavioral Sciences core courses (see advisor)

Component Area Option: 6 semester credit hours
MATH 2417 Calculus I\textsuperscript{3, 4}
MATH 2419 Calculus II\textsuperscript{3, 4}
PHYS 2125 Physics Laboratory I\textsuperscript{3, 5}
or PHYS 2421 Honors Physics I - Mechanics and Heat\textsuperscript{6, 7}

II. Major Requirements: 65-66 semester credit hours

Major Preparatory Courses: 22-23 semester credit hours beyond Core Curriculum
CS 1136 Computer Science Laboratory
CS 1336 Programming Fundamentals
CS 1337 Computer Science I
CS 2336 Computer Science II
CS 2305 Discrete Mathematics for Computing I
or MATH 3315 Discrete Mathematics and Combinatorics
MATH 2417 Calculus I\textsuperscript{3, 4, 8}
MATH 2418 Linear Algebra
MATH 2419 Calculus II\textsuperscript{3, 4, 8}
MATH 2451 Multivariable Calculus with Applications
PHYS 2325 Mechanics\textsuperscript{3, 5} and PHYS 2125 Physics Laboratory I\textsuperscript{3, 5}
or PHYS 2421 Honors Physics I - Mechanics and Heat\textsuperscript{3, 5, 9}
PHYS 2326 Electromagnetism and Waves\textsuperscript{3, 5}
or PHYS 2422 Honors Physics II - Electromagnetism and Waves\textsuperscript{3, 5}
PHYS 2126 Physics Laboratory II
Major Core Courses: 43 semester credit hours

CS 3345  Data Structures and Introduction to Algorithmic Analysis
CS 4347  Database Systems
CS 4371  Introduction to Big Data Management and Analytics
CS 4372  Computational Methods for Data Scientists
CS 4375  Introduction to Machine Learning
MATH 3310  Theoretical Concepts of Calculus
MATH 4301  Mathematical Analysis I
STAT 3355  Data Analysis for Statisticians and Actuaries
STAT 4351  Probability
STAT 4352  Mathematical Statistics
STAT 4354  Numerical and Statistical Computing
STAT 4355  Applied Linear Models
STAT 4360  Introduction to Statistical Learning
STAT 4475  Capstone Project
   or  CS 4475  Capstone Project
   or  MATH 4475  Capstone Project

III. Elective Requirements: 12-13 semester credit hours

Guided Electives: 12-13 semester credit hours

Although both lower- and upper-division courses may count as guided electives, they must be approved by the advisor and the student must complete at least 51 semester credit hours of upper-division courses to qualify for graduation.

NOTE: Students transferring into this program at the upper-division level are expected to have completed all of the 1000- and 2000- level Mathematics and Computer Science core course requirements.

1. Incoming freshmen must enroll and complete requirements of UNIV 1010 and the corresponding school-related freshman seminar course. Students, including transfer students, who complete their core curriculum at UT Dallas must take UNIV 2020.

2. Curriculum Requirements can be fulfilled by other approved courses from institutions of higher education. The courses listed are recommended as the most efficient way to satisfy both Core Curriculum and Major Requirements at UT Dallas.

3. A required Major course that also fulfills Core Curriculum requirements. If semester credit hours are counted in the Core Curriculum, students must complete additional coursework to meet the minimum requirement for graduation. Course selection assistance is available from the undergraduate advisor.

4. Three semester credit hours of Calculus are counted to fulfill the Mathematics Core Requirement with
the remaining one semester credit hour to be counted under Component Area Option Core.

5. Six semester credit hours of Physics are counted under Science core, and one semester credit hour of Physics (PHYS 2125) is counted under Component Area Core.

6. Please consult your advisor if selecting Honors Physics or if you have taken BA 1100.

7. Students may use three semester credit hours of PHYS 2421 to count under Science core, and one semester credit hour of PHYS 2421 under Component Area Option core.

8. MATH 2417 and MATH 2419 requirements can be fulfilled by completing MATH 2413, MATH 2414, and MATH 2415.

9. Students who complete PHYS 2421 do not need to complete PHYS 2125.