School of Natural Sciences and Mathematics

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)

View an Example of Degree Requirements by Semester

NSM Faculty

Professors: Zalman I. Balanov, Swati Biswas, Min Chen, Pankaj K. Choudhary, Baris Coskunuzer, Mieczyslaw K. Dabkowski, Vladimir Dragovic, Sam Efremovich, Yulia Gel, Wieslaw Krawcewicz, Susan E. Minkoff, L. Felipe Pereira, Dmitry Rachinskiy, Viswanath Ramakrishna, Janos Turi, John Zweck

Associate Professors: Maxim Arnold, Yan Cao, Liang Hong, Yifei Lou, Oleg Makarenkov, Tomoki Ohsawa, Anh Tran

Assistant Professors: Carlos Arreche, Sy Han (Steven) Chiou, Ronan Conlon, Qiwei Li, Stephen McKeown, Sunyoung Shin, Chuan-Fa Tang, Nathan Williams, Yunan Wu

Professors Emeriti: Larry P. Ammann, M. Ali Hooshyar, Patrick Odell, John W. Van Ness

Clinical Professor: Natalia Humphreys

Clinical Associate Professor: Mohammad Akbar

Clinical Assistant Professor: Wenyi (Roy) Lu

Professors of Instruction: Anatoly Eydelzon, Manjula Foley, Bentley T. Garrett, Yuly Koshevnik

Associate Professors of Instruction: Mohammad Ahsan, Kelly Aman, Malgorzata Dabkowska, Rabin Dahal, Derege Mussa, My Linh Nguyen, Jigarkumar Patel, Julie Sutton, Tristan Whalen

Assistant Professors of Instruction: Anani Komla Adubrah, Iris Alvarado, Hui Ding, Adannah Duruoha, Kemelli Estacio-Hiroms, Huizhen Guo, Joselle Kehoe, Runzhou Liu, Neha Makhijani, Diarisoa Mihaja
ECS Faculty


**Associate Professors:** Feng Chen, Lawrence Chung, Jorge A. Cobb, Vibhav Gogate, Benjamin Raichel, Nicholas Ruozzi, Rym Zalila-Wenkstern

**Assistant Professors:** Kyle Fox, Shuang Hao, Rishabh Iyer, Kangkook Jee, Chung Hwan Kim, Jin Kim, Jessica Ouyang, Shyi Wei, Yu Xiang, Wei Yang

**Professors Emeriti:** R. Chandrasekaran, Ivor P. Page, William J. Pervin, Balaji Raghavachari, Ivan Hal Sudborough, Klaus Truemper, Kang Zhang

**Professors of Instruction:** Ebru Cankaya, John Cole, Doug DeGroot, Timothy (Tim) Farage, Shyam Karrah, Pushpa Kumar, Nhut Nguyen, Greg Ozbinr, Miguel Razo-Razo

**Associate Professors of Instruction:** Sridhar Alagar, Gordon Arnold, Anjum Chida, Wei Pang Chin, Bhadrachalam Chitturi, Michael Christiansen, Chris I. Davis, Karen Doore, Neeraj Gupta, Khiem Le, Mehr Noboz Borazjany, Jalal Omer, Mark Paulk, Jason W. Smith, Laurie Thompson, Jeyakesavan (Jey) Veerasamy, James Willson, Nurcan Yuruk

**Assistant Professors of Instruction:** Eric Becker, Scott Dollinger, Serdar Erbatur, Ranran Feng, Omar Hamdy, Gity Karami, Kamran Khan, Karen Mazidi, Richard K. Min, Anarag Nagar, Priya Narayanasami, Elmer Salazar, Meghana Satpute, Klyne Smith, Nidhiben Solanki, Srimathi Srinivasan, Yi Zhao

I. Core Curriculum Requirements: 42 semester credit hours

**Communication: 6 semester credit hours**

- RHET 1302 Rhetoric
  
Select any 3 semester credit hours from Communication Core courses (see advisor)

**Mathematics: 3 semester credit hours**

- MATH 2417 Calculus
  
Or select any 3 semester credit hours from Mathematics Core courses (see advisor)

**Life and Physical Sciences: 6 semester credit hours**

- 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

Or select any 6 semester credit hours from Life and Physical Sciences Core courses (see advisor)

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

Or select any 6 semester credit hours from Government/Political Science Core courses (see advisor)

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\(^3\), 4

MATH 2419 Calculus II\(^3\), 4

PHYS 2125 Physics Laboratory I\(^3\), 5

or PHYS 2421 Honors Physics I - Mechanics and Heat\(^6\), 7

Or select any 6 semester credit hours from Component Area Option courses (see advisor)

II. Major Requirements: 64-65 semester credit hours

Major Preparatory Courses: 18-19 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
MATH 3315 Discrete Mathematics and Combinatorics
  or CS 2305 Discrete Mathematics for Computing II
MATH 2417 Calculus I3, 4, 9
MATH 2418 Linear Algebra
MATH 2419 Calculus II3, 4, 9
PHYS 2325 Mechanics3, 5 and PHYS 2125 Physics Laboratory I3, 5
  or PHYS 2421 Honors Physics I - Mechanics and Heat3, 5, 10
PHYS 2326 Electromagnetism and Waves3, 5
  or PHYS 2422 Honors Physics II - Electromagnetism and Waves3, 5
PHYS 2126 Physics Laboratory II

Major Core Courses: 46 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 3351 Advanced Calculus
MATH 4301 Mathematical Analysis I
STAT 3355 Introduction to Data Analysis
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: 13-14 semester credit hours

Guided Electives: 13-14 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.

Certificate in Data Science

15 semester credit hours

A Certificate in Data Science is offered by the Department of Mathematical Sciences in the School of Natural Sciences and Mathematics.

The focus of the Certificate in Data Science is to provide training in core data analytics skills, including programming and statistical and machine learning methods.

Admission Requirements

Two semesters of Calculus.

Certificate Requirements

Students must complete the following courses:

- [MATH 2333](#) Matrices, Vectors, and Data
- [MATH 4332](#) Scientific Computing using Python
- [MATH 4355](#) Methods of Applied Mathematics
- [STAT 3355](#) Introduction to Data Analysis
- [STAT 4360](#) Introduction to Statistical Learning

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.

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. BS in Data Science students can substitute MATH 2312 with MATH 2413.

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

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