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)[1]

View an Example of Degree Requirements by Semester

NSM Faculty

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

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

Assistant Professors: Carlos Arreche, Noirrit Chandra, Ronan Conlon, Rizwanur Khan, Qiwei Li, Stephen McKeown, Chuan-Fa Tang, Jiayi Wang, Nathan Williams, Nan Wu, Yunan Wu

Professors Emeriti: Larry Ammann, Ali Hooshyar, Patrick Odell, John Van Ness

Clinical Professor: Natalia Humphreys

Clinical Associate Professor: Mohammad Akbar

Clinical Assistant Professor: Wenyi Lu

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

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

Assistant Professors of Instruction: Anani Komla Adabrah, Iris Alvarado, Saikat Biswas, Hui Ding, Adannah Duruoha, Kemelli Estacio-Hiroms, Huizhen Guo, Shengjie Jiang, Joselle Kehoe, Runzhou Liu, Neha Makhijani, Irina Martynova, Diarisoa Mihaja Rakotomalala, Adrian Murza, Ajaya Paudel, Octavious Smiley, Nasrin Sultana, Che-Yu Wu

ECS Faculty

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Professors: Farokh B. Bastani, Sergey Bereg, Ovidiu Daescu, Yvo G. Desmedt, Ding-Zhu Du, András Faragó, Paul Fishwick, Xiaohu Guo, Gopal Gupta, Zygmunt Haas, Kevin Hamlen, Sanda M. Harabagiu, Dung T. Huynh, Jason Jue, Murat Kantarcioglu, Latifur Khan, Andrian Marcus, Neeraj Mittal, Dan I. Moldovan, Sriraam Natarajan, Yu-Chung (Vincent) Ng, Tien Nguyen, Simeon C. Ntafos, Balakrishnan Prabhakaran, Ravi Prakash, Kamil Sarac, Haim Schweitzer, Bhavani Thuraisingham, W. Eric Wong, Weili Wu, I-Ling Yen, Rym Zalila-Wenkstern

Associate Professors: Feng Chen, Lawrence Chung, Jorge A. Cobb, Vibhav Gogate, Benjamin Raichel, Nicholas Ruozzi

Assistant Professors: Xinya Du, Emily Kyle Fox, Yunhui Guo, Shuang Hao, Rishabh Iyer, Kangkook Jee, Chung Hwan Kim, Jin Kim, Jessica Ouyang, Yapeng Tian, Shiyi Wei, Yu Xiang, Wei Yang

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

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

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, Anarag Nagar, Mehra Nouroz Borazjany, Jalal Omer, Mark Paulk, Jason W. Smith, Laurie Thompson, 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, Priya Narayanasami, Brian Ricks, Elmer Salazar, Meghana Satpute, Nidhiben Solanki, Srimathi Srinivasan, Yi Zhao

I. Core Curriculum Requirements: 42 semester credit hours[2]

Communication: 6 semester credit hours

Select any 6 semester credit hours from Communication Core courses (see advisor)

Mathematics: 3 semester credit hours

MATH 2417 Calculus I[3, 4]

Or select any 3 semester credit hours from Mathematics Core courses (see advisor)

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

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 1436 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 I[8]

MATH 2417 Calculus I[3, 4, 9]

MATH 2418 Linear Algebra

MATH 2419 Calculus II[3, 4, 9]

PHYS 2325 Mechanics[3, 5] and PHYS 2125 Physics Laboratory I[3, 5]

or PHYS 2421 Honors Physics I - Mechanics and Heat[3, 5, 10]

PHYS 2326 Electromagnetism and Waves[3, 5]

or PHYS 2422 Honors Physics II - Electromagnetism and Waves[3, 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.

The plan must include sufficient upper-division courses to total 45 upper-division semester credit hours.

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.

Certificates

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.

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