Master of Science in Data Science

About This Program

UTA's Master of Science degree in Data Science helps meet the growing need for application-oriented engineers who can use data science tools and techniques to solve complex problems in industries such as manufacturing, logistics, healthcare and energy.

The program is unique for its breadth, offering a widely encompassing set of courses that allows students with or without a programming background to develop the necessary data science skills. It aims to instill the acumen needed to draw insights from data, to make sound decisions using data, and to effectively communicate about data driven findings and decisions.

Students will use real-world problems, methods and data in instruction materials through collaboration with community partners; problem-based, experiential learning which emphasizes hands-on coding exercises; service learning in which students learn while doing for social good; and inclusive learning to broaden student participation and strengthen student retention in data science education.

The degree requires 30 course hours and can be completed in two years. After completion of a set of core courses, students may choose electives from multiple programs to match their career interests. They may also participate in a capstone experience which can be integrated with workplace projects. Elective options offer additional flexibility to craft a degree that fits his or her specific situation.

Students will come from different backgrounds, but the most important factor for their growth and success will be a keen interest in learning the powerful ways in which data can be applied in various fields.

Competencies

1. Advanced Knowledge in Data Science: Upon completion, students will demonstrate mastery of core data science principles including data management, statistical modeling, machine learning, data mining, and data visualization. Apply mathematical, statistical, and computational frameworks to extract insights from complex, structured and unstructured data.
2. Data-Driven Problem Solving: Upon completion, students will be able to identify, formulate, and solve real-world problems using data-centric approaches. Design and implement data pipelines and workflows for large-scale data processing, analysis, and decision-making.
3. Computational and Statistical Proficiency: Upon completion, students will be able to use programming languages and tools (e.g., Python, R, SQL, Spark) to acquire, clean, analyze, and visualize data. Apply statistical inference, predictive modeling, and machine learning algorithms to draw actionable conclusions from data.
4. Data Engineering and Infrastructure: Upon completion, students will be able to design, implement, and maintain scalable data systems using cloud platforms, databases, and big data technologies. Optimize data storage, retrieval, and processing strategies for efficiency and reliability.
5. Collaboration and Interdisciplinary Work: Upon completion, students will be able to work effectively in cross-functional teams, collaborating with domain experts, stakeholders, and decision-makers. Manage projects and contribute to agile data science workflows in academic, industry, or research settings.

Admissions Criteria

Admission to the MS in Data Science (MSDS) program is based on the applicant's perceived ability to do graduate work in engineering and data science as shown by the applicant's test scores, transcripts, and other application documents.

To begin the program, an applicant must submit a completed application and fee to the UTA Graduate Admissions Office. When all application materials have been collected by Graduate Admissions, the application is forwarded to the program for evaluation. The admission decision is then communicated to Graduate Admissions, with the final decision sent via email to the applicant.

If there is a delay in receiving materials, the application may be deferred until all required materials are available. The applicant is notified of the deferral by the Graduate Admissions Office via email.

Requirements for admission to the MSDS program include:

1. An undergraduate degree, preferably in engineering or mathematics, that includes one semester of calculus and experience in programming
2. A 3.0 grade point average (on a 4.0 scale) on the last two years of undergraduate coursework. In particular, performance in engineering, science and mathematics is emphasized.
3. A sum of verbal plus quantitative scores of at least 300 on the GRE, with GRE quantitative score of at least 155 and GRE verbal score of at least 145.
4. International applicants and applicants whose native language is not English will need to take the Test of English as a Foreign Language (TOEFL) and score at least 80 with no area score of less than 20, or take the International English Language Testing System (IELTS) exam and score at least 6.5 in all areas.

Notes:

- An applicant who graduated with a bachelor's degree from an accredited U.S. or ABET institution within the last three years with a GPA of 3.2 or better on a 4.0 scale, and who is currently conducting professional work in related fields should contact the MSDS graduate advisors about the possibility of a GRE waiver.
- If an applicant has a bachelors or master's degree from an accredited U.S. institution, the English Proficiency requirement on TOEFL/IELTS is waived. However, it is waived for admission purposes only.
- If the applicant wishes to be considered for possible funding as a Graduate Teaching Assistant (GTA) or have any teaching responsibility, the applicant must have a U.S. bachelor's degree or a TOEFL speaking score of at least 23, or an IELTS speaking score of at least 7. A master's degree from a U.S. institution does not suffice for a waiver of the English proficiency requirement for international applicants desiring consideration for GTA support. An applicant who does not achieve the stated English proficiency standards may be required to take the Graduate English Skills Program (GESP) qualifying exam upon arrival at UTA to determine the need for additional English language courses after admission.
- Only the following application documents are required: application, fee, transcripts from all higher education institutions attended, and GRE and TOEFL/IELTS test scores. The MSDS program does not require nor reviews letters of recommendation, statements of purpose, or any other supplemental materials from applicants.

Curriculum

Foundations		
DASC 5300	FOUNDATION OF COMPUTING	3
DASC 5301	DATA SCIENCE	3
DASC 5302	INTRODUCTION TO PROBABILITY AND STATISTICS	3
DASC 5304	MACHINE LEARNING	3
DASC 5305	DATA VISUALIZATION	3
DASC 5306	BIG DATA MANAGEMENT	3
Specialization		**9**
Select any three DASC courses numbered 5000 or higher and/or any course in a related field approved by the student's advisor. No more than 3 hours may be Computer Science and Engineering courses.		
DASC 5303	DATA SCIENCE PROJECT MANAGEMENT	
DASC 5392	TOPICS IN DATA SCIENCE	
Capstone Project		**3**
DASC 5309	DATA SCIENCE CAPSTONE PROJECT	
or DASC 5391	DATA SCIENCE APPLICATIONS	
Or equivalent course as approved by program director or advisor		
Total Hours		**30**

Course requirements may be met using coursework from outside the MSDS program, as follows:

- The requirements for DASC 5300 and DASC 5302 can be fulfilled by appropriate undergraduate computing-related and statistics-related courses, respectively. For DASC 5301, DASC 5304, DASC 5305 and DASC 5306, external courses must be at the graduate level and cover all essential topics of the corresponding core course.
- The student must meet the 30-hour degree requirement. In lieu of each core course that is to be fulfilled by an external course, the student must take an extra elective.
- External courses must be vetted by and arrangements must be approved by an MSDS program advisor.

Program Completion

COURSE SEQUENCE

- Students should meet the requirements of DASC 5300, DASC 5301, DASC 5302, before or in the same semester when they are enrolled in any other course for fulfilling MSDS degree requirements.
- Students should only be enrolled in DASC 5309 or equivalent course after completing all core course requirements in the MSDS program.
- Elective courses can be taken in any order, as long as prerequisites are satisfied.

Advising Resources

Graduate students should consult a graduate advisor as needed

Location:

Engineering Research Building 6th Floor

Email:

csegradadvising@uta.edu

Phone:

N/A

Web:

Graduate Advising (https://www.uta.edu/academics/schools-colleges/engineering/academics/departments/cse/students/graduate-advising/)