Data Science, Analytics and Engineering (Sustainable Engineering and Built Environment), MS

ESDSESEBMS

Learn the data science skills needed for the modern economy while enhancing your expertise in sustainable engineering and the built environment. You'll take high-demand courses and work with colleagues to solve client-driven data science problems.

Program description

Degree awarded: MS Data Science, Analytics and Engineering (Sustainable Engineering and Built Environment)
Data scientist is consistently ranked among the top jobs in the U.S., and there is an increasing need for all engineers to make use of data science tools such as statistics, machine learning, artificial neural networks and artificial intelligence. Yet the majority of engineering occupations require subject matter expertise beyond data science.

This concentration in the MS program in data science, analytics and engineering provides an advanced education in high-demand data science and sustainable engineering and the built environment. A focus on probability and statistics, machine learning, data mining and data engineering is complemented by sustainable engineering and built environment-specific courses to ensure breadth and depth in data science and sustainable engineering and the built environment.

At a glance

- **College/School:** Ira A. Fulton Schools of Engineering
- **Location:** Tempe

Degree requirements

30 credit hours and a thesis, or
30 credit hours including the required capstone course (FSE 570)

Required Core (9 credit hours)
STP 502 Theory of Statistics II: Inference (3), EEE 554 Probability and Random Processes (3) or DSE 501 Statistics for Data Analysts (3)
CSE 511 Data Processing at Scale (3), CSE 512 Distributed Database Systems (3) or IFT 530 Advanced Database Management Systems (3)

Choose one from the following:
CSE 572 Data Mining (3)
CSE 575 Statistical Machine Learning (3)
EEE 549 Statistical Machine Learning: From Theory to Practice (3)
IEE 520 Statistical Learning for Data Mining (3)
IFT 511 Analyzing Big Data (3)
IFT 512 Advanced Big Data Analytics/AI (3)
MAE 551 Applied Machine Learning for Mechanical Engineers (3)
STP 550 Statistical Machine Learning (3)

Concentration (9 or 12 credit hours)
CEE 501 Machine Learning Techniques in Civil Engineering (3)
three additional courses from an approved list

Electives (6 or 9 credit hours)

Culminating Experience (3 or 6 credit hours)
CEE, CON or EVE 599 Thesis (6)
FSE 570 Data Science Capstone (3)

Additional Curriculum Information
Students should consult the academic unit for a list of approved electives and concentration course requirements.

Courses selected for Required Core or Concentration may not be used as elective coursework on the same plan of study. Students should check with their academic advisor to ensure that the total number of credit hours of their plan of study is equal to 30.

Admission requirements

Applicants must fulfill the requirements of both the Graduate College and the Ira A. Fulton Schools of Engineering.

Applicants are eligible to apply to the program if they have earned a bachelor's or master's degree in computing, engineering, mathematics, statistics, operations research, information technology or a related field from a regionally accredited institution.

Applicants must have a minimum cumulative GPA of 3.00 (scale is 4.00 = "A") in the last 60 hours of their first bachelor's degree program or a minimum cumulative GPA of 3.00 (scale is 4.00 = "A") in an applicable master's degree program.

Applicants are required to submit:

1. graduate admission application and application fee
2. official transcripts
3. written statement
4. professional resume
5. proof of English proficiency

Additional Application Information
An applicant whose native language is not English must demonstrate proficiency in the English language by scoring at least 90 on the TOEFL iBT, 7 on the IELTS, or 115 on the Duolingo English test, regardless of their current residency.

All applicants must demonstrate relevant coursework or experience in the following three areas:

* undergraduate statistics or probability (e.g., IEE 380 Probability and Statistics for Engineering Problem Solving, STP 420 Introductory Applied Statistics, STP 421 Probability, EEE 350 Random Signal Analysis)
* undergraduate linear algebra (e.g., MAT 242 Elementary Linear Algebra)
* familiarity with Matlab, Python, SQL, R or other relevant programming skills (in their professional resume)

In addition, applicants without an undergraduate degree in computer science, computer engineering, software engineering, information technology, industrial engineering, operations research, statistics or a related computing field must show evidence (in their professional resume) of at least one of the following certifications or equivalent experience:

* AWS certified cloud practitioner
* Google IT support certificate
* Google data analytics certificate

Tuition information

When it comes to paying for higher education, everyone's situation is different. Students can learn about ASU tuition and financial aid options to find out which will work best for them.

Application deadlines

Fall

Spring
expand

expand

Career opportunities

Civil, environmental, sustainable or construction management engineers with a background in data science can pursue opportunities in a variety of fields to manage and analyze data and extract knowledge from large data sets for decision-making, including in the following industries:

- building
- construction
- environmental remediation
- transportation
- water treatment

Contact information

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