Data Science, Analytics and Engineering (Mechanical and Aerospace Engineering), MS

ESDSEMAEMS

Learn the data science skills needed for the modern economy while enhancing your core expertise in mechanical and aerospace engineering. You'll develop statistical and data science skills through interdisciplinary courses offered within and beyond engineering, and work with colleagues to solve client-driven data science problems.

Program description

Degree awarded: MS Data Science, Analytics and Engineering (Mechanical and Aerospace Engineering)
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. For mechanical and aerospace engineering, the need for data science, including machine learning, is felt in all subdisciplines, including controls, energy systems, aeronautics, astronautics and mechanics.

The mechanical and aerospace engineering concentration in the MS program in data science, analytics and engineering provides an advanced education that combines high-demand data science and mechanical and aerospace engineering. A focus on probability and statistics, machine learning and data engineering is complemented by mechanical and aerospace engineering-specific courses to ensure breadth and depth in both data science and mechanical and aerospace engineering.

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 applied project course (MAE 593), 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)

Students choose one of 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 credit hours)

Electives (6-9 credit hours)

Culminating Experience (3-6 credit hours)
FSE 570 Data Capstone (3), MAE 593 Applied Project (3) or MAE 599 Thesis (6)

Additional Curriculum Information
Concentration and elective coursework should be selected in consultation with the program advisor. Coursework selected for Required Core 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 requirement 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 mechanical engineering, aerospace engineering 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. letter of intent
4. professional resume
5. proof of English proficiency

Additional Application Information

An applicant whose native language is not English must provide proof of English proficiency regardless of current residency. Applicants demonstrate proficiency in the English language by scoring at least 90 on the TOEFL iBT (taken in a testing center); 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:

- familiarity with Matlab, Python, SQL, R or other relevant programming skills (in the professional resume)
- undergraduate linear algebra (e.g., MAT 242 Elementary Linear Algebra)
- 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)

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 the professional resume) of at least one of the following certifications or equivalent experience:

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

Career opportunities

Data scientist is consistently ranked among the top jobs in the U.S. Mechanical and aerospace 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:

- aircraft design
- energy systems
- manufacturing
- product design
- space systems

Contact information

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