

MASTER OF SCIENCE IN DATA SCIENCE IN ENGINEERING

The Master of Science in Data Science in Engineering produces graduates with the knowledge, skills, and experience necessary to apply data science and machine learning technologies to engineering problems. Each student completes coursework in a common core relevant to all engineering disciplines and then chooses a specialization within a disciplinary domain. The program has flexibility to supplement the common core with domain-specific knowledge and skills, which may include applications of data science, artificial intelligence, and machine learning within the engineering specialization area.

Required core courses (12 cr-hr total):

All students take the following courses.

Any core course substitution must be received Armour College steering committee prior to course registration.

Code	Title	Credit Hours
(1) Engineering fundamentals of AI and data science principles (3 cr-hr)		
BME 560	Methods in Biomedical Data Science	3
or ECE 566	Machine and Deep Learning	
or MMAE 500	Data Driven Modeling	
(2) Methods and applications of deep learning and related tools (3 cr-hr)		
MMAE 506	Methods and Applications of Deep Learning	3
(3) Engineering science of data systems, handling, and processing (3 cr-hr)		
ECE 573	Cloud Computing and Cloud Native Systems	3
(4) Trustworthy AI (3 cr-hr)		
ECE 572	Secure Machine Learning Design and Applications	3

Disciplinary Track (18 cr-hr):

Students must choose one of the following tracks, detailed below.

- Architectural Engineering
- Biomedical Engineering
- Chemical Engineering
- Civil Engineering
- Electrical and Computer Engineering
- Environmental Engineering
- Mechanical, Materials, and Aerospace Engineering
- Pharmaceutical Engineering

Architectural Engineering Track

Code	Title	Credit Hours
Disciplinary elective courses (12 cr-hr): take four courses from among the following.		

CAE 505	Applications of Computational Fluid Dynamics in Engineering	3
CAE 513	Building Science	3
CAE 517	HVAC Systems Design	3
CAE 524	Building Enclosure Design	3
CAE 526	Energy Conservation in Buildings	3
CAE 538	Control of Building Environmental Systems	3
CAE 550	Applied Building Energy Modeling	3
CAE 552	Introduction to Sustainable Building Design	3
CAE 553	Measurement and Instrumentation in Architectural Engineering	3
CAE 556	Net Zero Energy Building Design I	3
CAE 557	Net Zero Energy Building Design II	3

Elective courses (6 cr-hr):

Advisor approved courses in engineering, mathematics, or computer science.

Biomedical Engineering Track

Code	Title	Credit Hours
Required courses (8 cr-hr):		
BME 500	Introduction to Biomedical Engineering	2
BME 533	Biostatistics	3
BME 553	Advanced Quantitative Physiology	3
Elective courses (10 cr-hr):		
Advisor approved courses in engineering, mathematics, or computer science.		

Chemical Engineering Track

Code	Title	Credit Hours
Required courses (15 cr-hr):		
CHE 501	Transport Phenomena	3
CHE 503	Thermodynamics	3
CHE 506	Entrepreneurship and Intellectual Property Management	3
CHE 525	Chemical Reaction Engineering	3
or CHE 577	Bioprocess Engineering	
CHE 530	Advanced Process Control	3
or CHE 535	Applications of Mathematics to Chemical Engineering	

Elective courses (3 cr-hr):

Advisor approved courses in engineering, mathematics, or computer science.

Civil Engineering Track

Code	Title	Credit Hours
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Disciplinary elective courses (12 cr-hr):

CAE and/or ENVE coursework at the graduate level.

Elective courses (6 cr-hr):

Advisor approved courses in engineering, mathematics, or computer science.

Electrical and Computer Engineering Track

Code	Title	Credit Hours
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Required courses (12 cr-hr):

ECE 501	Artificial Intelligence and Edge Computing	3
ECE 567	Statistical Signal Processing	3
ECE 574	Data Science for Engineers	3
ECE 590	Object-Oriented Programming and Machine Learning	3

Elective courses (6 cr-hr):

Advisor approved courses in engineering, mathematics, or computer science.

Environmental Engineering Track

Code	Title	Credit Hours
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Disciplinary elective courses (12 cr-hr): take four courses from among the following.

ENVE 401	Introduction to Water Resources Engineering	3
ENVE 404	Water and Wastewater Engineering	3
ENVE 463	Introduction to Air Pollution Control	3
ENVE 501	Environmental Chemistry	3
ENVE 506	Chemodynamics	3
ENVE 522	Global Environmental Change and Sustainability Analysis	3
ENVE 528	Modeling of Environmental Systems	3
ENVE 542	Physicochemical Processes in Environmental Engineering	3

Elective courses (6 cr-hr):

Advisor approved courses in engineering, mathematics, or computer science.

Mechanical, Materials, and Aerospace Engineering Track

Code	Title	Credit Hours
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Disciplinary elective courses (12 cr-hr):

MMAE coursework at the graduate level.

Elective courses (6 cr-hr):

Advisor approved courses in engineering, mathematics, or computer science.

Pharmaceutical Engineering Track

Code	Title	Credit Hours
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Required courses (12 cr-hr):

CHE 506	Entrepreneurship and Intellectual Property Management	3
CHE 577	Bioprocess Engineering	3
CHE 583	Pharmaceutical Engineering	3
CHE 585	Drug Delivery	3

Elective courses (6 cr-hr):

Advisor approved courses in engineering, mathematics, or computer science.