Daniel Felix Ritchie School
of Engineering & Computer Science
UNIVERSITY OF DENVER

MS in Applied Data Science and AI - Sample Course Schedule

All classes are 4 credit hours. The program is a total of 48 credit hours

Required Courses (Complete 32 hours)

Schedule is subject to change

Course Name & Number	Description	Prereqs	AUTUMN	WINTER	SPRING	SUMMER
Foundations in Python Programming COMP 3005	Accelerated python programming course for students who have not had a for-credit Python programming course before.		Online or In-Person	Online		
Essential Math for Applied Data Science & AI COMP 3009	Covers basics needed for data science and machine learning, covering basic linear algebra, basic calculus, and basic probability and statistics		Online	In-Person		
Python Software Development COMP 3006	Continuation of python programming focusing on object oriented design and core libraries for data and manipulation and computation	COMP 3005		Online	In-Person	
Database Organization and Management I COMP 3421	Introduction to relational and nonrelational database management system design and operation.	COMP 3005	Online	Online		In-Person
Intro to Probability & Statistics for Data Science & AI COMP 4441	Applied class in inferential statistics that delves into parametric and nonparametric testing as well as linear models.	COMP 3009		Online or In-Person	Online	
Machine Learning COMP 4432	Introduction to machine learning techniques as applied to data science and AI	COMP 3006	Online		In-Person	Online
Data Visualization COMP 4433	Theory, selection, and design of visualizations to support analytical problem-solving and technical communication with data	COMP 3006			Online	Online
Deep Learning: Model Design & Application COMP 4531	Introduction to artificial neural network models and optimization techniques focusing on multi-layer architectures and CNNs	COMP 4432	Online	In-Person		

Elective Courses (Complete 16 hours)

Schedule is subject to change

Course Name & Number	Description	Prereqs	AUTUMN	WINTER	SPRING	SUMMER
Advanced Probability & Statistics for Data Science & AI COMP 4442	Advanced statistical techniques for classification, prediction, simulation, and dimensional reduction	4441			Online or In-Person	Online
Parallel & Distributed Computing for Data Science & AI COMP 4334	Applied parallel and distributed machine learning for big data analytics	3006		Online or In-Person	Online or In-Person	
Algorithms for Data Science & AI COMP 4581	Algorithmic design and data structures to solve computational problems and process large datasets	3006	Online	Online		
Data Science & AI Capstone COMP 4449	Design, develop, test, and present 'full-cycle' data science products or services	4432			Online or In-Person	In-Person
Machine Learning Operations (MLOps) COMP 4450	Introduction to model and data development, data engineering, and scalable model deployment using industry standard techniques such as containerization.	3421, 3006, 4432	In-Person			Online
Deep Learning for Sequence Data COMP 4456	Application of deep learning models for natural language processing and time series data	4432	*Contact Enrollment Manager: Coming in 26/27*			
Large Language Models (LLMs) for Data Science & AI COMP 4451	Introduction to using LLMs as a tool for data science problems	4432	*Contact Enrollment Manager: Coming in 26/27*			
Data Science & AI Independent Study COMP 4991	Study of a particular topic supervised by a faculty member	none	*Offered every quarter*			
Internship COMP 3904	Receive credit toward graduation for participating in a paid data science and/or AI internship.	none	*Offered every quarter*			

Sample Course Sequence

There are many pathways through the MS in Applied Data Science and AI program. Your pathway will depend on prior learning you come in, whether you are taking the program as a full-time or part-time student as well as your start date.

Below is one sample path through the program as a full-time student. These schedules and courses offered may not be possible each year and offerings may vary. You will work with the Data Science and AI Student Success Manager to customize your plan.
- This does not account for credit for prior learning or certificate-based course subsitutions
- This is a sample schedule with the minium course offerings and additional course schedules may vary from term to term
- International Students will need to work with their Student Success Advisor as they follow different rules for online and in-person courses

Hybrid Roadmap

Example for a full-time student

Students can complete their degree requierements taking one class in-person and one online each quarter

	YEAR 1				YEAR 2		
	Autumn	Winter	Spring	Summer	Autumn	Winter	Spring
Autumn Start	Foundations in Python Programming COMP 3005	Python Software Development COMP 3006	Machine Learning COMP 4432	Database Organization and Management I COMP 3421	Deep Learning: Model Design & Application COMP 4531	Elective	
	Essential Math for Applied Data Science & AI COMP 3009	Intro to Probability & Statistics for Data Science & AI COMP 4441	Data Visualization COMP 4433	Elective	Elective	Elective	
	8 credit hours	8 credit hours	8 credit hours	8 credit hours	8 credit hours	8 credit hours	**48 Credit Hours**
Winter Start		Foundations in Python Programming COMP 3005	Python Software Development COMP 3006	Machine Learning COMP 4432	Deep Learning: Model Design & Application COMP 4531	Elective	Elective
		Essential Math for Applied Data Science & AI COMP 3009	Intro to Probability & Statistics for Data Science & AI COMP 4441	Data Visualization COMP 4433	Database Organization and Management I COMP 3421	Elective	Elective
	8 credit hours	8 credit hours	8 credit hours	8 credit hours	8 credit hours	8 credit hours	**48 Credit Hours**

Online Roadmap

Example for a full-time student

Students can complete their degree requirements taking only online courses each quarter

	YEAR 1				YEAR 2		
	Autumn	Winter	Spring	Summer	Autumn	Winter	Spring
Autumn Start	Foundations in Python Programming COMP 3005	Python Software Development COMP 3006	Elective	Machine Learning COMP 4432	Deep Learning: Model Design & Application COMP 4531	Elective	
	Essential Math for Applied Data Science & AI COMP 3009	Intro to Probability & Statistics for Data Science & AI COMP 4441	Data Visualization COMP 4433	Elective	Database Organization and Management I COMP 3421	Elective	
	8 credit hours	8 credit hours	8 credit hours	8 credit hours	8 credit hours	8 credit hours	**48 Credit Hours**
Winter Start		Foundations in Python Programming COMP 3005	Python Software Development COMP 3006	Machine Learning COMP 4432	Deep Learning: Model Design & Application COMP 4531	Elective	Data Visualization COMP 4433
		Essential Math for Applied Data Science & AI COMP 3009	Intro to Probability & Statistics for Data Science & AI COMP 4441	Elective	Database Organization and Management I COMP 3421	Elective	Elective
	8 credit hours	8 credit hours	8 credit hours	8 credit hours	8 credit hours	8 credit hours	**48 Credit Hours**