

MASTER

Data Science and Artificial Intelligence (DS&AI)

TU/e

EINDHOVEN
UNIVERSITY OF
TECHNOLOGY

TUE.NL

DS&AI graduates are *Data Scientists* and *AI Engineers* with the ethos of a “civil engineer”. Their deep technical abilities in a variety of expertise areas to enable them to develop *smart* solutions that are robust, trustworthy, fair, and secure. They develop solutions together *with* people considering technical, social, and ethical aspects.

Program structure			Total ≥120 EC
	Expertise Area/Trajectory	Course	
Core courses (25 EC)	<i>Statistics</i>	Longitudinal Data Analysis	5 EC
	<i>AI</i>	Foundations of AI	5 EC
	<i>DS&AI in Context</i>	Ethics and Philosophy of AI	5 EC
	<i>Data Engineering and Management</i>	Big Data Management	5 EC
	<i>DS&AI in Context</i>	Data Intelligence Challenge	5 EC
Core electives (≥5 EC)	<i>Explainable Data Analytics</i>	Research Topics in Data Mining	5 EC
	<i>Data Mining and Machine Learning</i>	Foundations of Process Mining	5 EC
	<i>Explainable Data Analytics</i>	Visual Analytics	5 EC
Specialization electives (≥30 EC)	<i>DS&AI in Context</i>	Applications of Data Science for Software Engineering	5 EC
	<i>Data Engineering and Management</i>	Engineering Data-Intensive Systems	5 EC
		Knowledge Engineering	5 EC
		Principles of Data Protection	5 EC
	<i>Algorithms</i>	Topological Data Analysis	5 EC
		Algorithms for Geographic Data	5 EC
		Optimization for Data Science	5 EC
	<i>Explainable Data Analytics</i>	Advanced Process Mining	5 EC
	<i>Statistics</i>	Statistical Learning Theory	5 EC
		Statistics for Big Data	5 EC
		Time-Series & Forecasting	5 EC
		Network Statistics for Data Science	5 EC
	<i>Data Mining and Machine Learning</i>	Deep Learning	5 EC
		Text Mining	5 EC
		Machine Learning Engineering	5 EC
		Learning Optimal Decision Strategies	5 EC
		<i>AI and Machine Learning</i>	Generative AI Models
	Uncertainty Representation and Reasoning	5 EC	
	Advanced Topics in AI	5 EC	

Program structure		Total ≥120 EC
Free Electives (15 EC)	Free electives	15 EC
Graduation (45 EC)	Seminar	5 EC
	Preparation phase	10 EC
	Master Graduation project	30 EC

You follow **6 core courses** giving you a foundation in 4+1 different trajectories: (Statistics, AI, Data Engineering and Management, DS&AI in Context) + (Explainable Data Analytics or Data Mining and Machine Learning). You then specialize in **6 more elective courses**. You pick 2 trajectories as your **major trajectories** and follow 2 courses in each, leading to specialize knowledge for your graduation project, e.g., you pick 2 more Statistics courses, and 2 more AI courses. To ensure broad knowledge and skills, you pick 2 more **minor courses** that are not in your major trajectories. You complete your program with **3 more free electives** you can choose freely (more from your major trajectories, additional trajectories, from another department, an internship, etc.)

Schedule		
Q1	2AMS10 - Longitudinal Data Analysis	core course
	2AMI10 - Foundations of Process Mining (can also be taken in Q5)	core elective (1-in-3)
	2AMM20 - Research Topics in Data Mining (can also be taken in Q5)	core elective (1-in-3)
	2AMU20 - Generative AI Models	
Q2	OLM190 - Philosophy and Ethics of AI	core course
	2AMU10 - Foundations of AI	core course
	2IMD10 - Engineering Data Systems	
	2AMI20 - Advanced Process Mining	
	2IMP40 - Applications of Data Science for Software Engineering	
	2AMS40 - Learning Optional Decision Strategies	
Q3	2AMD15 - Big Data Management	core course
	2AMV10 - Visual Analytics	core elective (1-in-3)
	2DI70 - Statistical Learning Theory	
	2AMM15 - Machine Learning Engineering	
	2AMS50 - Optimization for Data Science	
Q4	2AMC15 - Data Intelligence Challenge	core course
	2AMD20 - Knowledge Engineering	
	2IMG10 - Topological Data Analysis	
	2AMS20 - Statistics for Big Data	
	2DD23 - Time-Series Analysis & Forecasting	
	2AMM10 - Deep Learning	
Q5	2AMS25 - Principles of Data Protection	
	2IMG15 - Algorithms for Geographic Data (can also be taken in Q1)	
	2AMU30 - Uncertainty Representation and Reasoning	
	2AMS30 - Network Statistics for Data Science	
	2AMM30 - Text Mining	
	2AMM40 - Advanced Topics in AI	
Q6	Seminar and Preparing Graduation Project	
Q7+Q8	Graduation Project	