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To help you make informed choices regarding broadening and deepening electives, within each Thematic Learning Area (TLA) a number of learning paths are offered. A learning path is a selection of TLA electives across departments, grouped around a specific subtheme. The learning paths within a TLA are based on the assumed amount of pre-requisite knowledge, indicating that familiar programs have better access. This means that some learning paths are specifically accessible for students from one department, whereas other learning paths suits best for students from a specific department. If you have met the expected pre-knowledge, the relevant electives become accessible. You can make well-informed choices by either choosing specific electives across the different learning paths, or by choosing a pre-defined learning path.

Always make sure that you check the required pre-requisite knowledge/courses via the Course Catalogue for the elective courses you would like to follow!

TLA Artificial Intelligence	
Description of the content	The Artificial Intelligence TLA collects bachelor electives dedicated to the theory and application of Artificial Intelligence technology, resulting in systems that can perform tasks that typically require human intelligence, and that answer contemporary technological, economic and social challenges.
Offered by	DS, M&CS, EE, AP, IE&IS, ID, CE&C, BME
Language	English
Contact person	Martijn Willemsen, M.C.Willemsen@tue.nl

#### Learning path 1 – Machine Learning

Торіс	Course codes	Course name	Link to course catalogue
1. Programming in Python Suggested	JBI010	Programming	
Alternatives	0HV120	Programming for psychology and technology	
	31PAP	Programming for Applied Physics	
	8BA080	Programming for data analytics	
	1BV30	Fundamentals of algorithmic programming for Operations Management	
	1BK50	Algorithmic programming for operations management	
	6BBR06	Programming and Linear Algebra	
2. Statistics Suggested	JBM015	Data Statistics	
Alternatives	2DI90	Probability and statistics	
	0SV120	Statistics for Sustainable Innovation	
	2DD80	Statistics for IE	
3. Data Structures Suggested	21T80	Discrete structures	
Alternatives	JBI026	Discrete Mathematics	

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4. Linear Algebra Suggested	2DRR00	Linear algebra and applications	
Alternatives	JBM075	Linear Algebra for Data Science	
	2MBA20	Linear Algebra 1	
5. Data Analytics Suggested	2IAB1	Foundations of Data Analytics	
Machine Learning Fundamentals			
	JB1030	Data Mining	
	2IRR50	Statistics and Machine learning	
	5XSL0	Fundamentals of machine learning	
	34MLS	Machine Learning in Science	
Responsible Data Science*			
	21X30	Responsible Data Science	
AI Challenges			
	0ISBEP05	Innovationspace Bachelor end project extension (Interdisciplinary Learning)	
*Limited capacity			

Note: The learning path Machine Learning offers a good path into an AI master at TU/e, as it contains several courses that are also required to enter one of the three Data Science / AI masters at TU/e. You can find details on the entry requirements for each program below, but in general these programs require knowledge in programming, statistics, linear algebra, courses in data structures, data bases and machine learning.

#### Master Data Science & AI:

Premaster: <u>https://studiegids.tue.nl/opleidingen/graduate-school/masters-programs/data-science-artificial-intelligence/admission/pre-master-data-science-artificial-intelligence-dsai</u>

#### Master in Data Science in Business and Entrepreneurship (JADS, Den Bosch)

Premaster: <u>https://www.jads.nl/nl/onderwijs/master-programma-data-science-business-entrepreneurship/premaster-data-science-business-entrepreneurship/</u>

#### Master Artificial Intelligence and Engineering Systems

Premaster: <u>https://studiegids.tue.nl/opleidingen/pre-masterprogrammas/artificial-intelligence-engineering-systems/curriculum</u>

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#### Learning path 2 – Data Science

Торіс	Course codes	Course name	Link to course catalogue
1. Programming in Python Suggested	JBI010	Programming	
Alternatives	0HV120	Programming for psychology and technology	
	31PAP	Programming for Applied Physics	
	8BA080	Programming for data analytics	
	1BV30	Fundamentals of algorithmic programming for Operations Management	
	1BK50	Algorithmic programming for operations management	
	6BBR06	Programming and Linear Algebra	
2. Statistics Suggested	JBM015	Data Statistics	
Alternatives	2DI90	Probability and statistics	
	0SV120	Statistics for Sustainable Innovation	
	2DD80	Statistics for IE	
Databases			
	JB1050	Data management for data analytics	
	2ID50	Datamodelling and databases	
	JBM230	Data Acquisition Methods	
	JBM170	Field Data Acquisition and Analysis	
AI Challenges			
	OISBEP05	Innovationspace Bachelor end project extension (Interdisciplinary Learning)	

Note: The learning path Data Science offers a good path into an AI master at TU/e, as it contains several courses that are also required to enter one of the three Data Science / AI masters at TU/e. You can find details on the entry requirements for each program below, but in general these programs require knowledge in programming, statistics, linear algebra, courses in data structures, data bases and machine learning.

#### Master Data Science & AI:

Premaster: <u>https://studiegids.tue.nl/opleidingen/graduate-school/masters-programs/data-science-artificial-intelligence/admission/pre-master-data-science-artificial-intelligence-dsai</u>

#### Master in Data Science in Business and Entrepreneurship (JADS, Den Bosch)

Premaster: <u>https://www.jads.nl/nl/onderwijs/master-programma-data-science-business-entrepreneurship/premaster-data-science-business-entrepreneurship/</u>

#### Master Artificial Intelligence and Engineering Systems

Premaster: <u>https://studiegids.tue.nl/opleidingen/pre-masterprogrammas/artificial-intelligence-engineering-systems/curriculum</u>

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### Learning path 3 – Business AI Applications

Торіс	Course codes	Course name	Link to course catalogue
1. Programming in Python Suggested	JBI010	Programming	
Alternatives	0HV120	Programming for psychology and technology	
	31PAP	Programming for Applied Physics	
	8BA080	Programming for data analytics	
	1BV30	Fundamentals of algorithmic programming for Operations Management	
	1ВК50	Algorithmic programming for operations management	
	6BBR06	Programming and Linear Algebra	
2. Statistics Suggested	JBM015	Data Statistics	
Alternatives	2DI90	Probability and statistics	
	0SV120	Statistics for Sustainable Innovation	
	2DD80	Statistics for IE	
Business Intelligence			
	1BK20	Business process simulation	
	1BV70	Business analytics & decision support	
	JB1060	Fundamentals of Process Mining	
AI Challenges			
	OISBEP05	Innovationspace Bachelor end project extension (Interdisciplinary Learning)	

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### Learning path 4 – Al-driven Design

Торіс	Course codes	Course name	Link to course catalogue
1. Programming in Python Suggested	JBI010	Programming	
Alternatives	0HV120	Programming for psychology and technology	
	31PAP	Programming for Applied Physics	
	8BA080	Programming for data analytics	
	1BV30	Fundamentals of algorithmic programming for Operations Management	
	1BK50	Algorithmic programming for operations management	
	6BBR06	Programming and Linear Algebra	
Internet of Things			
	DBSU10	Designing connected experiences	
Human-Machine interaction			
	DBB220	Intelligent interactive products	
Human-centered AI			
	DBSU10	Designing connected experiences	
AI Challenges			
	OISBEP05	Innovationspace Bachelor end project extension (Interdisciplinary Learning)	

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