

Course Title	Data Science, Math & Technology		
Semester	Fall (semester 1)		
Inholland Faculty	Engineering, Design and Computing		
Language of instruction	English		
Cycle	Undergraduate		
Inholland Location	Diemen		
Code Subjects	Code	Subject Title	ECTS
	3719MACHLA	Machine Learning	6
	3719DECLCA	Data Engineering and Cloud Computing	5
	3719PS6DSA	Professional Skills: Data Science Ethics	3
	3719GEOISA	Geographic Information Systems	4
	3719NLNGPA	Natural Language Processing	4
	3719PRDSCA	Project Data Science	5
	3718IT412A	Learning Challenge	1
	3711IT422A	Research: literature review	2
Number of ECTS	30		
Content subjects	<p>Term 1: Data Science Building Blocks</p> <p>The first term covers the fundamental techniques. The Machine Learning course gives students a solid foundation of all aspects of machine learning, including preprocessing, regression, dimension reduction methods, decision trees, clustering methods, Neural Networks and Bayesian models.</p> <p>Working with Big Data involves applying complex algorithms to large data sets. The course Data Engineering and Cloud Computing focusses on storing and processing large and complex data sets that do not fit on a single machine. Students learn to work with NoSQL databases and to distribute data and computation by means of cloud solutions.</p> <p>Whenever we deal with privacy sensitive data, ethical issues arise. The course Professional Skills: Data Science Ethics discusses ethical and legal aspects of data science, so that students become aware of their responsibilities as a data scientist.</p>		

	<p>Term 2: Applications of Data Science</p> <p>The second term of the minor focusses on applications of Data Science for real-world problems. The term includes courses on handling location data (Geographical Information Systems) and text data (Natural Language Processing). During the Learning Challenge, students can dive deeper into a data science topic of their own choice. The minor is completed with Project Data Science: in this group project, students work in an interdisciplinary team on a data science problem for a real company.</p>
<p>Lecturer(s)</p>	<p>Vera Hollink</p>
<p>Learning outcomes</p>	<p>After completing the minor the student is able to:</p> <ul style="list-style-type: none"> • Train Machine Learning models for real-world tasks. • Use NoSQL databases to store and retrieve unstructured and semi-structured data. • Parallelize algorithms and run them in the cloud. • Use Natural Language Processing to analyze text documents. • Use Geographical Information Systems to analyze geospatial data. • Set-up and conduct literature review. • Identify ethical and legal aspects of data science projects.
<p>Mode of delivery, planned activities and teaching methods</p>	<p>The Data Science Minor at Inholland Diemen focusses on the mathematics and techniques of Data Science. The minor addresses both the theory and the practical application. Students learn not only which techniques to use, but also the inner mathematical workings of these techniques. The practical side of Data Science consists of hands-on lab sessions where students gain experience with technologies such as scikit-learn, MongoDB, Azure, and many others. Everything comes together in an interdisciplinary group project, where students work on a real data science problem for a client company.</p>
<p>Prerequisites and co-requisites (if applicable)</p>	
<p>Recommended or required reading and/or other learning resources/tools</p>	<p>The minor is open for 3rd and 4th year bachelor students. The following skills are required:</p> <ul style="list-style-type: none"> • Python programming • Basic statistics • Basic algebra • Databases/SQL <p>If you are unsure if the minor fits your skills or ambitions, you can contact the program at Vanessa.Fernand@inholland.nl.</p>

Assessment methods and criteria	The minor is assessed by a mix of exams, assignments, and an interdisciplinary group project.
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