



Swiss International
Institute Lausanne

MASTER OF SCIENCE IN ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

The program allows students to deepen their knowledge of information technologies and gain expert-level expertise in the rapidly developing fields of machine learning (ML) and artificial intelligence (AI). Graduates of the program will become a competitive workforce, driving forward the progress of the AI revolution while remaining aware of the significant dangers and challenges posed by this global development.

The curriculum includes disciplines in advanced mathematics, the history of AI and ML, as well as key subjects such as big data mining, image recognition methods, autonomous driving models, and more. Mandatory ethics courses related to the field are also included in the program.

Language of instruction/examination: Russian

Official duration: 3 semesters (1.5 years): 3 semesters + Master Thesis

ECTS: 92 ECTS

Degree awarded: Master of Science in Artificial Intelligence and Machine Learning

COURSES

The courses for the Master of Science in Artificial Intelligence and Machine Learning program are divided into three main categories: **Core Courses** (29 ECTS), which are mandatory, and **Elective Courses** (33 ECTS), which would allow students to tailor the program to their individual interests and career goals. At the end of the studies, students are required to complete a Master's thesis (30 ECTS). Additionally, students have the option to earn a Professional Certificate from the University of Cape Town in English and Soft Skills for Tech Professionals.

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AIMS OF THE PROGRAM

Provide students with a solid foundation in core areas of Artificial Intelligence and Machine Learning, including algorithms and methods, data analytics, computer vision, and natural language processing, to prepare them for advanced study or professional careers in technology-driven industries. Equip students with practical, hands-on experience in designing, developing, and deploying intelligent systems across real-world applications. Foster the ability to critically evaluate AI systems and apply ethical principles in the development and use of machine learning technologies. Develop computational and programming skills essential for research and innovation in AI. Strengthen abilities in both independent and collaborative research projects. Prepare students for admission to competitive doctoral programs worldwide or for immediate employment in fields requiring advanced AI and ML expertise.

LEARNING OUTCOMES

Building a solid foundation in advanced mathematics and statistics for data science

This outcome focuses on equipping students with the mathematical tools necessary for understanding and applying core concepts in machine learning, including descriptive statistics, probability theory, and regression analysis.

Understanding the historical evolution and ethical dimensions of AI and ML

Students will gain insight into the philosophical, social, and historical development of artificial intelligence and machine learning. They will be able to critically assess ethical implications related to bias, transparency, and accountability in AI systems, as well as evaluate the ethical impact of AI-driven developments on the job market and society at large.

Acquiring fundamental and advanced knowledge of algorithms and machine learning methods

After completing the program, students will be proficient in classical and modern machine learning algorithms, understanding their theoretical foundations as well as practical implementations for diverse tasks and datasets.

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Developing practical skills in natural language processing and large language models:

This outcome focuses on training students to build, fine-tune, and evaluate models capable of processing, understanding, and generating both human and programming languages, using statistical methods and neural network-based approaches.

Gaining expertise in big data mining, cloud computing, and parallel computing environments

Students will acquire the ability to process and analyze large-scale datasets efficiently, leveraging cloud and distributed systems to design scalable AI solutions.

Exploring innovative AI applications in image processing, virtual reality, creative industries, and finance

This outcome prepares students to apply AI techniques in interdisciplinary and industry-relevant domains, including visual media, gaming, financial modeling, and generative content.

Developing familiarity with emerging computing paradigms and security technologies

Students will be introduced to novel computing models such as quantum computing and foundational principles of cryptography and blockchain, essential for the future of secure and efficient AI systems.

Enhancing professional communication and research skills in English

Students will strengthen their ability to present, write, and discuss complex technical content in English, preparing them for international academic or industry environments.

CURRICULUM OVERVIEW

	Course	ECTS	Assessment
	SEMESTER 1	32	
MAG0025	Advanced Statistics for Data Science	6	Practical coursework
MAG0010	History of ML and AI	3	Oral exam
MAG0011	Algorithms and Methods	6	Oral exam
MAG0012	Machine Learning	6	Practical coursework
MAG0013	Natural Language processing	5	Practical coursework
MAG0014	Ethics in ML and AI	3	Oral exam
MAG0024/ EDX-B-0029	Professional English Language/ EdX course Block: 1. English for Tech Professionals EDX 2. Soft Skills for Tech Professionals EDX	3	Oral exam
			Defined by the provider

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	SEMESTER 2	30	
MAG0015/ MAG0016	Introduction to Novel and Quantum Computing/ Parallel Computing and Cloud Computing	6	Oral exam
MAG0017/ MAG0018	Big Data Mining/ Large Language Models	6	Practical coursework
MAG0019/ MAG0020	Image Processing/ Creative AI: Stories, Music, Images, and Video	6	Practical coursework
MAG0021/ MAG0022	AI and Finance/ Virtual Reality, AI, and the Gaming Industry	6	Oral exam
MAG0023/ MAG0025/ EDX-B-0028	Cryptography and Blockchain Technologies or Professional English Language/ EdX course Block: 1. Job Interview Preparation For Tech Professionals EDX 2. Storytelling That Delivers Program and Project Outcomes 3. Public Speaking 4. Customer Centric Marketing for Entrepreneurs 5. The Entrepreneurial Mindset	6	Practical coursework Defined by the provider
	SEMESTER 3	30	
Master Thesis			

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