



Swiss International  
Institute Lausanne

## BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY, ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

The programme provides a solid foundation in computer science alongside practical skills for today's technology-driven world. It combines core subjects—programming, data management, mathematics, and systems design—with advanced training in AI and machine learning, including Generative AI and Applied AI Development (IBM Professional Certificates) and hands-on AI workshops.

Students graduate with both theoretical knowledge and practical experience, enabling them to start careers in their area of specialisation—whether as AI developers, machine learning engineers, software developers, or IT project managers. The curriculum also prepares them for further academic study through a Master's programme, with the option to pursue a Bachelor thesis in AI or ML-related topics. This multidisciplinary and forward-looking education opens doors to diverse roles across the tech industry and research sectors.

**Language of instruction/examination:** Russian

**Official duration: 8 semesters (4 years):** 7 semesters + Bachelor thesis

**ECTS:** 240 ECTS

**Degree awarded:** Bachelor of Science in Information Technology, Artificial Intelligence & Machine Learning

## COURSES

Courses for Bachelor of Science in Information Systems and Technology programme are divided into 3 main categories: **Core courses (151 ECTS)** and **Elective modules (53 ECTS)** which are introduced during the 2nd and 3rd year of

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the programme, **and Workshops (6 ECTS)**. At the end of the studies the student is obliged to prepare a **Bachelor thesis (30 ECTS)**.

## **AIMS OF THE PROGRAM**

Equip students with strong competencies in software development and information systems management to meet the evolving needs of the global tech industry. Develop their expertise in data analysis, cybersecurity, and intelligent systems, enabling them to support data-driven decision-making and protect digital infrastructure. Train students to design and build user-friendly, AI-enhanced applications and platforms, with a focus on user experience, accessibility, and adaptive technologies that improve interaction across diverse user groups.

## **LEARNING OUTCOMES**

### **Building a foundation in fundamental mathematics and statistics for data science**

This outcome focuses on equipping students with the mathematical apparatus necessary for understanding and applying core concepts in information systems and technologies

### **Develop Software Using Modern Programming Languages and Tools, Adapting to the Evolving Technology Landscape**

This outcome focuses on students' ability to design and develop software solutions using contemporary programming languages, frameworks, and tools. Students will learn to keep pace with technological advancements, enhancing their adaptability and problem-solving skills in response to the dynamic IT landscape.

### **Design, Implement, and Maintain Information Systems and Communication Networks, Ensuring Scalability and Reliability**

Students will acquire the skills to build, deploy, and maintain robust information systems and networks that can scale with organizational needs. This includes planning network infrastructure, ensuring consistent performance, and addressing challenges related to system reliability and user demand.

### **Develop AI-Driven Solutions for Data Collection, Processing, and Decision Support**

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This learning outcome equips students with the skills to design and implement technologies for collecting, processing, and analyzing data. Emphasis is placed on leveraging machine learning, advanced data analytics, and intelligent automation to extract actionable insights from complex datasets. Students will learn to build systems that support informed decision-making across industries by turning raw data into meaningful, predictive, and real-time information.

### **Design AI-Enhanced, User-Centric Applications and Platforms for Seamless Cross-Device Experiences**

Students will learn to develop applications and platforms that prioritize user experience, accessibility, and cross-device responsiveness. Special emphasis is placed on integrating AI and machine learning to enhance usability—through features such as personalization, adaptive interfaces, and predictive interaction—ensuring a seamless and engaging experience for diverse user groups in increasingly intelligent digital environments.

### **Demonstrate Effective Communication, Teamwork, and Leadership Skills in Diverse and Cross-Cultural Environments**

This outcome prepares students to work collaboratively in multicultural teams, fostering an environment of mutual respect and understanding. They will develop strong communication and leadership skills, essential for coordinating with stakeholders and contributing positively to global, cross-functional projects.

### **Career Launch and Advancement Through Professional Certifications**

Students earn multiple recognized professional certificates throughout the program—enabling them to secure entry-level tech jobs while pursuing a flexible, fully online degree. Certifications from institutions like Harvard and IBM in Python, web development, databases, and IT support open early career opportunities. Each subsequent year adds advanced credentials—from Stanford, TU Delft, UCX, and others—in data science, cybersecurity, quantum computing, and professional communication. This structured pathway enhances job readiness from year one and supports continuous career growth in the digital job market.

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## CURRICULUM OVERVIEW

	Course	ECTS	Assessment
	<b>SEMESTER 1 (CORE COURSES)</b>	<b>30</b>	
BM0061/ EDX-S-0008	Informatics/ CS50: Introduction to Computer Science	6	Oral exam
			Defined by the provider
BM0095	Mathematics	6	Oral exam
BM0009	Algebra and Number Theory	6	Practical coursework
BM0040	Discrete Mathematics	4	Practical coursework
BM0042	English Language	4	Oral exam
BM0105	Project Management	4	Practical coursework

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	<b>Course</b>	<b>ECTS</b>	<b>Assessment</b>
	<b>SEMESTER 2 (CORE COURSES)</b>	<b>30</b>	
BM0104	Probability Theory and Mathematical Statistics	6	Oral exam
BM0140/ EDX-B-0037	Introduction to Programming/ <b>EdX course block:</b> 1. CS50's Introduction to Programming with R 2. CS50's Introduction to Programming with Python	6	Practical coursework
			Defined by the provider
BM0137	Artificial Intelligence Basics	4	Practical coursework
BM0024	Logic	6	Practical coursework
BM0134/ EDX-B-0030	Introduction to Database Systems/ <b>EdX course block:</b> 1. CS50's Introduction to Databases with SQL 2. CS50's Introduction to Cybersecurity	4	Practical coursework
			Defined by the provider
BM0136/ EDX-B-0031	Introduction to Software Engineering/ <b>EdX course block:</b> 1. Software Engineering Basics for Everyone 2. Git and GitHub Basics	4	Practical coursework
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	<b>Course</b>	<b>ECT S</b>	<b>Assessment</b>
	<b>SEMESTER 3 (CORE COURSES)</b>	<b>30</b>	
BM0020	Content Management	4	Practical coursework
BM0129	Data Structures and Algorithms	4	Practical coursework
BM0126/ EDX-B-0032	Web Programming/ <b>EdX course block:</b> 1. CS50's Web Programming with Python and JavaScript 2. Statistical Learning with R	6	Practical coursework
			Defined by the provider
BM0067	Information Technology	4	Practical coursework
BM0058	Hypertext and Multimedia Information Technologies	4	Practical coursework
BM0053/ EDX-B-0033	Hardware of Computer Systems/ <b>EdX course block:</b> 1. Hardware and Operating Systems 2. Networking and Storage Essentials 3. IT Support Case Studies	4	Practical coursework
			Defined by the provider
BM0035	Development of Interactive Applications	4	Practical coursework

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	<b>Course</b>	<b>ECTS</b>	<b>Assessment</b>
	<b>SEMESTER 4 (CORE COURSES)</b>	<b>30</b>	
BM0064/ EDX-B-0034	Information Security and Information Protection/ <b>EdX course block:</b> 1. Unlocking Information Security I: From Cryptography to Buffer Overflows 2. Unlocking Information Security II: An Internet Perspective 3. Beginners Guide to Cybersecurity 4. Introduction to Cloud Computing 5. Cybersecurity Basics: Tools and Cyberattacks 6. Database Basics and Security	6	Practical coursework
			Defined by the provider
BM0029	Data Management	4	Oral exam
BM0004	Administration of Information Systems	4	Oral exam
BM0141/ EDX-B-0035	Advanced Programming Concepts/ <b>EdX course block:</b> 1. C++ Programming: Basic Skills 2. C++ Programming: Intermediate Concepts 3. Advanced Bayesian Statistics Using R 4. Introduction to Bayesian Statistics Using R	6	Practical coursework
			Defined by the provider
BM0063	Information Processing Technologies	4	Oral exam
BM0033	Design of Information Systems and Technologies	6	Oral exam

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	<b>Course</b>	<b>ECTS</b>	<b>Assessment</b>
	<b>SEMESTER 5 (CORE COURSES)</b>	<b>30</b>	
BM0124	3D Graphics	6	Practical coursework
BM0034	Development of an Electronic Portal	6	Oral exam
BM0062	Information and Analytical Systems	2	Practical coursework
BM0123	Theory of Information Processes and Systems	6	Oral exam
BM0097	Negotiation Skills	4	Practical coursework
BM0014	Business Communication	4	Practical coursework
SEM0414	Practical Workshop in AI and Machine Learning I	2	Practical coursework

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	<b>Course</b>	<b>ECTS</b>	<b>Assessment</b>
	<b>SEMESTER 6 (CORE COURSES)</b>	<b>30</b>	
BM0130	History of Science	4	Practical coursework
BM0049	Functional Programming	6	Practical coursework
BM0025	Cross-Cultural Management	4	Practical coursework
BM0111	Raster Graphics	5	Practical coursework
BM0125	Vector Graphics	5	Practical coursework
BM0135	Data Visualization	4	Practical coursework
SEM0415	Practical Workshop in AI and Machine Learning II	2	Practical coursework

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	<b>SEMESTER 7 (CORE COURSES)</b>	<b>31</b>	
BM0144/ EDX-B-0038	Advanced Machine Learning and AI Applications / <b>EdX course block:</b> 1. Applied AI Development series 2. Generative AI Engineering Series	7	Practical coursework
BM0142	Introduction to Cloud Computing	4	Practical coursework
BM0199	Quantum Algorithm Implementations for Beginners	6	Oral exam
BM0198	Fundamentals of Machine Learning and AI Ethics	2	Oral Exam
BM0133	Mobile Application Development	6	Practical coursework
BM0082/ EDX-B-0036	Leadership and Teambuilding/ <b>EdX course block:</b> 1. English for Tech Professionals EDX 2. Soft Skills for Tech Professionals EDX 3. Job Interview Preparation For Tech Professionals EDX	4	Practical coursework
SEM0416	Practical Workshop in AI and Machine Learning III	2	Practical coursework
	<b>SEMESTER 8</b>	<b>30</b>	
Bachelor Thesis in AI or Machine Learning topic			

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