

Università
della
Svizzera
italiana

Faculty
of
Informatics

Plan of studies
3-5-8

2024/25

2024/
25



Plan of studies

3-5-8

2024/25

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Bachelor

BSc

Study curricula

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- Bachelor in Informatics
 - Bachelor in Data Science

Bachelor in Informatics

Study programme
Students enrolled 2024/25

	Course	Instructor	ECTS
First semester 30 ECTS	Calculus	Hormann	6
	Computer Architecture	Langheinrich	6
	Programming Fundamentals 1	Furia	9
	Reason and Responsibility in Decision Making	Erez	3
	Software Atelier 1: Fundamentals of Informatics	Bavota	6
Second semester 30 ECTS	Algorithms & Data Structures	Carzaniga	6
	Discrete Structures	Wolf	6
	Ethics in Computing	Santini	3
	Linear Algebra	Pivkin	6
	Programming Fundamentals 2	Hauswirth	6
Third semester 30 ECTS	Automata & Formal Languages	Pozzi	3
	Probability & Statistics	Wit, Richter Mendoza	6
	Programming Fundamentals 3	Binder	6
	Systems Programming	Carzaniga	6
	Software Atelier 3: The Web	Pautasso	9
Fourth semester 30 ECTS	Computer Networking	Santini	6
	Data Management	Eugster	6
	Introduction to Computational Science	Multerer	3
	Operating Systems	Pedone	6
	Software Atelier 4: Software Engineering Project	Mocci	9
Fifth semester 30 ECTS	Software Atelier 5: Field Project	Lanza, Prevostini	9
	<i>Electives</i>		
	Algorithms & Data Structures 2	Papadopoulou	3
	Artificial Intelligence	Gambardella	3
	Computer Graphics	Didyk	6
	Experimentation & Evaluation	Bavota	3
	Information Retrieval	Landoni	6
	Numerical Computing	Vecchi	6
Sixth semester 30 ECTS	Bachelor Project	Pezzè	12
	<i>Electives</i>		
	Image & Video Processing	Didyk	6
	Machine Learning	Alippi	6
	Optimization Methods	Sulem	6
	Quantum Computing	Wolf	6
	Theory of Computation	Sharygina	6
Mandatory course 1.5 ECTS	Alpine Seminar		1.5

Bachelor in Informatics

Study programme
Students enrolled 2023/24

	Course	Instructor	ECTS
First semester 30 ECTS	Calculus	Hormann	6
	Computer Architecture	Langheinrich	6
	Programming Fundamentals 1	Furia	9
	Reason and Responsibility in Decision Making	Erez	3
	Software Atelier 1: Fundamentals of Informatics	Bavota	6
Second semester 30 ECTS	Algorithms & Data Structures	Carzaniga	6
	Discrete Structures	Wolf	6
	Linear Algebra	Pivkin	6
	Programming Fundamentals 2	Hauswirth	9
	Software Atelier 2: Human-Computer Interaction	Santini	3
Third semester 30 ECTS	Automata & Formal Languages	Pozzi	3
	Probability & Statistics	Wit	6
	Programming Fundamentals 3	Binder	6
	Systems Programming	Carzaniga	6
	Software Atelier 3: The Web	Pautasso	9
Fourth semester 30 ECTS	Computer Networking	Santini	6
	Data Management	Eugster	6
	Introduction to Computational Science	Multerer	3
	Operating Systems	Pedone	6
	Software Atelier 4: Software Engineering Project	Mocci	9
Fifth semester 30 ECTS	Software Atelier 5: Field Project	Lanza, Prevostini	9
	<i>Electives</i>		
	Algorithms & Data Structures 2	Papadopoulou	3
	Artificial Intelligence	Gambardella	3
	Computer Graphics	Didyk	6
	Experimentation & Evaluation	Bavota	3
	Information Retrieval	Landoni	6
	Numerical Computing	Vecchi	6
Sixth semester 30 ECTS	Bachelor Project	Pezzè	12
	<i>Electives</i>		
	Image & Video Processing	Didyk	6
	Machine Learning	Alippi	6
	Optimization Methods	Sulem	6
	Quantum Computing	Wolf	6
	Theory of Computation	Sharygina	6

Bachelor in Informatics

Study programme
Students enrolled 2022/23

	Course	Instructor	ECTS
First semester 30 ECTS	Calculus	Hormann	6
	Computer Architecture	Langheinrich	6
	Programming Fundamentals 1	Furia	9
	Reason and Responsibility in Decision Making	Carzaniga	3
	Software Atelier 1: Fundamentals of Informatics	Bavota	6
Second semester 30 ECTS	Algorithms & Data Structures	Carzaniga	6
	Discrete Structures	Wolf	6
	Linear Algebra	Pivkin	6
	Programming Fundamentals 2	Hauswirth	9
	Software Atelier 2: Human-Computer Interaction	Santini	3
Third semester 30 ECTS	Automata & Formal Languages	Pozzi	3
	Probability & Statistics	Wit	6
	Programming Fundamentals 3	Binder	6
	Systems Programming	Carzaniga	6
	Software Atelier 3: The Web	Pautasso	9
Fourth semester 30 ECTS	Computer Networking	Santini	6
	Data Management	Eugster	6
	Introduction to Computational Science	Multerer	3
	Operating Systems	Pedone	6
	Software Atelier 4: Software Engineering Project	Mocci	9
Fifth semester 30 ECTS	Algorithms & Data Structures 2	Papadopoulou	3
	Artificial Intelligence	Gambardella	3
	Computer Graphics	Didyk	6
	Experimentation & Evaluation	Bavota	3
	Information Retrieval	Landoni	6
	Numerical Computing	Schenk	6
Software Atelier 5: Field Project	Prevostini	9	
Sixth semester 30 ECTS	Image & Video Processing	Didyk	6
	Machine Learning	Alippi	6
	Optimization Methods	Nestola	6
	Quantum Computing	Wolf	6
	Theory of Computation	Sharygina	6
	Bachelor Project	Pezzè	12

Bachelor in Data Science

Study programme
Students enrolled 2024/25

	Course	Instructor	ECTS
First semester 30 ECTS	Calculus	Hormann	6
	Introduction to Data Science	Wit	3
	Principles of Finance	Nam	3
	Reason and Responsibility in Decision Making	Erez	3
	Software Atelier 1: Fundamentals of Informatics	Bavota	6
Second semester 30 ECTS	Algorithms & Data Structures	Carzaniga	6
	Data Management	Eugster	6
	Discrete Structures	Wolf	6
	Linear Algebra	Pivkin	6
	Statistics: Data Analysis and Probability	Ravanelli	6
Third semester 30 ECTS	Algorithms & Data Structures 2	Papadopoulou	3
	Artificial Intelligence	Gambardella	3
	Information Retrieval	Landoni	6
	Mathematics for Data Science	n/a	6
	Probability & Statistics	Wit	6
	Statistics II	Mancini	6

Bachelor in Data Science

Stream in Informatics

Students enrolled 2024/25

	Course	Instructor	ECTS
Fourth semester 30 ECTS	Design, Causality and Modelling	Wit	3
	Introduction to econometrics	Gagliardini	6
	Machine Learning	Alippi	6
	Optimization Methods	Sulem	6
	Programming Fundamentals 2	n/a	9
Fifth semester 30 ECTS	Data Science Atelier	n/a	6
	Econometrics	Ortelli	6
	Numerical Computing	Schenk	6
	<i>Electives</i>		
	Deep Learning Lab	Vercesi	3
	Economics and market design	n/a	6
	High Performance Computing	Schenk	6
	Scattered Data Approximation	Multerer	3
Sixth semester 30 ECTS	Data Analytics	Crestani	6
	Project	Faculty	6
	Theory of Computation	Sharygina	6
	<i>Electives</i>		
	Computational Social Choice	n/a	3
Graphical Models and Network Science	Wit	6	
Graph Deep Learning	Alippi	6	
Image and Video Processing	Didyk	6	
Quantitative Methods for Finance	n/a	6	
Quantum Computing	Wolf	6	
	Theory of Finance	n/a	6
Mandatory course 1.5 ECTS	Alpine Seminar		1.5

Bachelor in Data Science

Stream in Finance and Economics

Students enrolled 2024/25

	Course	Instructor	ECTS
Fourth semester 30 ECTS	Computational social choice	n/a	3
	Design, Causality and Modelling	Wit	3
	Financial Economics	n/a	6
	Introduction to econometrics	Gagliardini	6
	Machine Learning	Alippi	6
	Microeconomics	n/a	6
Fifth semester 30 ECTS	Data Science Atelier	n/a	6
	Econometrics	Ortelli	6
	Economics and Markets Design	n/a	6
	<i>Electives</i>		
	Financial Markets	n/a	3
	Macroeconomics 1	n/a	3
	Microeconomics	n/a	3
	Public economics	n/a	6
Sixth semester 30 ECTS	Data Analytics	Crestani	6
	Project	Faculty	6
	Quantitative methods for finance	Ortelli	6
	<i>Electives</i>		
	Graphical Models and Network Science	Wit	6
	Graph Deep Learning	Alippi	3
	Image and Video Processing	Didyk	6
	Introduction to Computational Science	Multerer	3
	Quantum Computing	Wolf	6
Mandatory course 1.5 ECTS	Alpine Seminar		1.5

Masters

Study curricula

- Master in Informatics
- Master in Artificial Intelligence
- Master in Computational Science
- Master in Software and Data Engineering
- Master in Management and Informatics
- Master in Financial Technology and Computing

Informatics

Study plan

Students obtain a Master of Science degree in Informatics by completing the following across the two years:

- 30 out of 36 ECTS of core courses
- 30 ECTS thesis
- 60 ECTS of elective courses, 6 of which can be from non-INF USI Master programmes.

Additionally, they have the possibility to obtain a specialisation in one of the following research areas by completing 18 ECTS of electives and their master thesis in the same area:

- Artificial Intelligence
- Computer Systems
- Geometric and Visual Computing
- Information Systems
- Programming Languages
- Software Development
- Theory and Algorithms

	Course	Instructor	ECTS	
Autumn semester				
Core Courses	Algorithms & Complexity	Papadopoulou	6	
	Distributed Systems	Chuprikov	6	
	High-Performance Computing	Schenk, Eftekhari	6	
	Machine Learning	Wand	6	
	Software Design & Modeling	Furia	6	
Electives*	Advanced Java Programming	Binder, Rosà	6	
	Advanced Topics in Machine Learning	Alippi, Carman	6	
	Advanced Topics in Visual Computing	Didyk	3	
	Artificial Intelligence	Lanzi	6	
	Computer Aided Verification	Sharygina	6	
	Deep Learning Lab	Vercesi	3	
	Distributed Algorithms	Pedone	6	
	Edge Computing in the IoT	Ferrante	6	
	Mobile and Wearable Computing	Gjoreski	6	
	Numerical Algorithms	Hormann	6	
	Programming Styles	Hauswirth	3	
	Software Performance	Hauswirth	6	
	User Experience Design	Landoni, Langheinrich	6	
	Spring semester			
	Core Courses	Information Security	Langheinrich	6
Electives*	Advanced Networking	Carzaniga	6	
	Business Process Modeling, Management and Mining	Pautasso	3	
	Computational Fabrication	Didyk	6	
	Computer Architecture and Logic Design	Pozzi	6	
	Computer Vision & Pattern Recognition	Hormann	6	
	Data Analytics	Crestani	6	
	Geometric Algorithms	Papadopoulou	6	
	Graph Deep Learning	Alippi	3	
	Image & Video Processing	Didyk	6	
	Information & Physics	Wolf	3	
	Quantum Computing	Wolf	6	
	Robotics	Giusti	6	
	Security Aspects of Machine Learning	Regazzoni	3	
	Software Analysis	Furia	6	
	Software Architecture	Pautasso	6	
Software Quality & Testing	Pezzè	6		
Master thesis **	Faculty		30	
ECTS Total			120	

* Including up to 6 ECTS of electives from USI Master courses over the 2 years.

** Master Thesis can be started in the 3rd semester.

	Course	Instructor	ECTS
Specialisation in Artificial Intelligence			
Autumn	Advanced Topics in Machine Learning	Alippi, Carman	6
	Artificial Intelligence	Lanzi	6
	Deep Learning Lab	Vercesi	3
Spring	Robotics	Giusti	6
	Security Aspects of Machine Learning	Regazzoni	3
Specialisation in Computer Systems			
Autumn	Computer Aided Verification	Sharygina	6
	Distributed Algorithms	Pedone	6
	Edge Computing in the IoT	Ferrante	6
	Mobile and Wearable Computing	Gjoreski	6
Spring	Computer Architectures and Logic Design	Pozzi	6
	Advanced Networking	Carzaniga	6
	Security Aspects of Machine Learning	Regazzoni	3
Specialisation in Geometric and Visual Computing			
Autumn	Advanced Topics in Visual Computing	Didyk	3
Spring	Computational Fabrication	Didyk	6
	Computer Vision & Pattern Recognition	Hormann	6
	Geometric Algorithms	Papadopoulou	6
	Graph Deep Learning	Alippi	3
	Image & Video Processing	Didyk	6
Specialisation in Information Systems			
Autumn	Distributed Algorithms	Pedone	6
	Mobile and Wearable Computing	Gjoreski	6
	User Experience Design	Landoni, Langheinrich	6
Spring	Advanced Networking	Carzaniga	6
	Business Process Modeling, Management and Mining	Pautasso	3
	Data Analytics	Crestani	6

	Course	Instructor	ECTS
Specialisation in Programming Languages			
Autumn	Advanced Java Programming	Binder, Rosà	6
	Computer Aided Verification	Sharygina	6
	Programming Styles	Hauswirth	3
	Software Performance	Hauswirth	6
Spring	Computer Architectures and Logic Design	Pozzi	6
	Software Analysis	Furia	6
Specialisation in Software Development			
Autumn	Computer Aided Verification	Sharygina	6
	Mobile and Wearable Computing	Gjoreski	6
	Programming Styles	Hauswirth	3
	Software Performance	Hauswirth	6
Spring	Software Analysis	Furia	6
	Software Architecture	Pautasso	6
	Software Quality & Testing	Pezzè	6
Specialisation in Theory and Algorithms			
Autumn	Computer Aided Verification	Sharygina	6
	Numerical Algorithms	Hormann	6
Spring	Geometric Algorithms	Papadopoulou	6
	Information & Physics	Wolf	3
	Quantum Computing	Wolf	6

Artificial Intelligence

	Course	Instructor	ECTS
First semester			
Core Courses 18 ECTS	Algorithms & Complexity	Papadopoulou	6
	Deep Learning Lab	Vercesi	3
	Machine Learning	Wand	6
	Numerical Algorithms	Hormann	3
Electives 12 ECTS	Advanced Topics in Visual Computing	Didyk	3
	Bioinformatics	Limongelli	6
	Edge Computing in the IoT	Ferrante	6
	High-Performance Computing	Schenk, Eftekhari	6
	Introduction to Data Science	Wit	6
	Introduction to Ordinary Differential Equations	Richter Mendoza	6
	Knowledge Search & Extraction	Tonella	3
	Mobile and Wearable Computing	Gjoreski	6
	Programming Styles	Hauswirth	3
	User Experience Design	Landoni, Langheinrich	6
	Writing Business Plans	Martignoni	3
	Second semester		
Core Courses 24 ECTS	Computer Vision & Pattern Recognition	Hormann	6
	Data Analytics	Crestani	6
	Robotics	Giusti	6
	Stochastic Methods	Richter Mendoza	6
Electives 6 ECTS	Advanced Networking	Carzaniga	6
	Business Intelligence and Applications	Martinenghi	6
	Business Process Modeling, Management and Mining	Pautasso	3
	Computer Architectures and Logic Design	Pozzi	6
	Computational Fabrication	Didyk	6
	Graphical Models and Network Science	Wit	6
	Effective High-Performance Computing & Data Analytics	Schenk	6
	Entrepreneurship: Theory & Practice	Pieper	3
	Geometric Algorithms	Didyk	6
	Image & Video Processing	Papadopoulou	6
	Information Modeling & Analysis	Tonella	6
	Information & Physics	Wolf	3
	Philosophy and Artificial Intelligence	Landgrebe, Smith	6
	Quantum Computing	Wolf	6
	Scientific Machine Learning	Favino, Kothari	6
	Security Aspects of Machine Learning	Regazzoni	3

	Course	Instructor	ECTS
Third semester			
Core Courses 12 ECTS	Advanced Topics in Machine Learning	Alippi	6
	Artificial Intelligence	Gambardella	6
	Master Thesis	Faculty	9
Electives 18 ECTS	Choose from the electives of the 1st semester		18
Fourth Semester			
Core Courses 24 ECTS	Graph Deep Learning	Alippi	3
	Master Thesis	Faculty	21
Electives 6 ECTS	Choose from the electives of the 2nd semester		
ECTS Total			120

**Computational Science
Data Science Track**

	Course	Instructor	ECTS
First semester			
Core Courses 30 ECTS	High-Performance Computing	Schenk, Eftekhari	6
	Introduction to Data Science	Wit	6
	Introduction to Ordinary Differential Equations	Richter Mendoza	3
	Introduction to Programming (Python)	Binder	6
	Numerical Algorithms	Hormann	6
	Scattered Data Approximation	Multerer	3
Electives 6 ECTS	History of Computing	Schmutterer	3
	Introduction to Ordinary Differential Equations	Richter Mendoza	3
	Machine Learning	Alippi	3
	Scattered Data Approximation	Multerer	3
Second semester			
Core Courses 21/24 ECTS	Graphical Models and Network Science	Wit	6
	Stochastic Methods	Richter Mendoza	6
2 out of the following 3 courses:	Effective High-Performance Computing & Data Analytics	Schenk	6
	Graph Deep Learning	Alippi	3
	Introduction to Bayesian Learning	Mira	3
Electives 9/6 ECTS	Computer Vision & Pattern Recognition	Hormann	6
	Data Analytics	Crestani	6
	Data Management	Eugster	6
	Discretization Methods	Pivkin	6
	Geometric Algorithms	Papadopoulou	6
	Information & Physics	Wolf	3
	Information Security	Langheinrich	6
	Particle Methods	Pivkin	6
	Quantum Computing	Wolf	6
	Text Analysis and Spatial Data for Economists	Parchet, D'Ambros	6

	Course	Instructor	ECTS
Third semester			
Core Courses 18 ECTS	Master thesis preparation	Schenk, Wit, Eftekhari	6
	Analysis of Social Networks	Lomi, Richter Mendoza, Bianchi	6
	Advanced Topics in Machine Learning or Bioinformatics	Alippi, Carman Limongelli	6
Electives 24 ECTS	Algorithms & Complexity	Papadopoulou	6
	Artificial Intelligence	Lanzi	6
	Computational Biology and Drug Design, Databases	Limongelli	6
	Deep Learning Lab	Crestani	6
	Distributed Algorithms	Vercesi	3
	History of Computing	Pedone	6
	Machine Learning	Schmutterer	3
	Software Atelier: Simulation, Data Science & Supercomputing	Wand	6
		Schenk	6
Fourth Semester			
Core Courses 24 ECTS	Master Thesis	Faculty	24
Electives 6 ECTS	Choose from the electives of the 2nd semester (track-specific)		6
ECTS Total			120

**Computational Science
High-Performance Computing Track**

	Course	Instructor	ECTS
First semester			
Core Courses 30 ECTS	High-Performance Computing	Schenk, Eftekhari	6
	Introduction to Data Science	Wit	6
	Introduction to Ordinary Differential Equations	Richter Mendoza	3
	Introduction to Programming (Python)	Binder	6
	Numerical Algorithms	Hormann	6
	Scattered Data Approximation	Multerer	3
Electives 6 ECTS	History of Computing	Schmutterer	3
	Introduction to Ordinary Differential Equations	Richter Mendoza	3
	Scattered Data Approximation	Multerer	3
Second semester			
Core Courses 24 ECTS	Computer Architectures and Logic Design	Pozzi	6
	Discretization Methods	Pivkin	6
	Effective High-Performance Computing & Data Analytics	Schenk	6
	Quantum Computing	Wolf	6
Electives 6 ECTS	Advanced Networking	Carzaniga	6
	Computational Fabrication	Didyk	6
	Computer Vision & Pattern Recognition	Hormann	6
	Geometric Algorithms	Papadopoulou	6
	Graph Deep Learning	Alippi	3
	Graphical Models and Network Science	Wit	6
	Information & Physics	Wolf	3
	Information Security	Langheinrich	6
	Particle Methods	Pivkin	6
	Robotics	Giusti	6

	Course	Instructor	ECTS
Third semester			
Core Courses 18 ECTS	Algorithms & Complexity	Papadopoulou	6
	Master thesis preparation	Schenk, Wit, Eftekhari	6
	Distributed Algorithms or Distributed Systems	Pedone Chuprikov	6 6
	Electives 24 ECTS	Advanced Topics in Machine Learning	Alippi
Artificial Intelligence		Lanzi	6
Databases		Crestani	6
Deep Learning Lab		Vercesi	3
History of Computing		Schmutterer	3
Machine Learning Software Atelier: Simulation, Data Science & Supercomputing		Wand Schenk	6 6
Fourth Semester			
Core Courses 24 ECTS	Master Thesis	Faculty	24
Electives 6 ECTS	Choose from the electives of the 2nd semester (track-specific)		6
ECTS Total			120

Financial Technology & Computing

	Course	Instructor	ECTS
First semester			
Core Courses 18 ECTS	Data Analytics for Finance I & II	Gruber	6
	Introduction to Fintech Investments**	Gruber Franzoni	6 6
	Advanced track 12 ECTS	Distributed Systems Machine Learning	Chuprikov Wand
Core track 12 ECTS	Fundamentals of Informatics Introduction to Programming (Python)	Sharygina Binder	6 6
Founders Option 6 ECTS	Fintech Innovations In Financial Services	Nam	3
	Writing business plans	Martignoni	3
Second semester			
Core Courses 12 ECTS	Financial Intermediation**	Plazzi	6
	Information Security	Langheinrich	6
Advanced track 12 ECTS	Risk Management**	Plazzi	6
	Software Quality & Testing	Pezzè	6
Core track 12 ECTS	Data Management	Eugster	6
	Algorithms & Data Structures or Theory of Computation ***	Carzaniga Sharygina	6 6
	Electives 6 ECTS	Blockchains & Digital Currencies	Morini
Business Analytics		Bettinazzi	3
Critical Consumer Behaviour		Gibbert	6
Discrete Structures****		Wolf	6
ESG I: Corporate Governance**		Nowak	3
Human Resource Management		Solari	3
Robotics		Giusti	6
Text Analysis and Spatial Data for Economists		Parchet, D'Ambros	6
Trading and Market Microstructure		Kaul	3
Risk Management**/****		Plazzi	6
Founders I (only for Founders option)	Gruber	6	

* The Master Thesis can be started in the 3rd semester (12 ECTS).

** To obtain the SFI accreditation, students have to achieve 45 ECTS among these courses.

*** Only if Fundamentals of Informatics passed with at least 7.5/10

**** Only for Core track students

***** If 18 ECTS of SFI courses passed, can be swapped with Financial Stability

	Course	Instructor	ECTS
Third semester			
Core Courses 6 ECTS	Financial Econometrics**	Mancini	6
	Advanced track 12 ECTS	Distributed Algorithms***** Systems Security	Pedone Regazzoni
Core track 12 ECTS	Distributed System Financial Modelling**	Chuprikov Franzoni	6 6
Electives 12/0* ECTS	Advanced Topics in Finance	Della Corte, Fuss	3
	Algorithms & Complexity	Papadopoulou	6
	Alternative Investments	Mueller	3
	Finance and Sustainability**	Piatti	3
	Financial Stability**	Mele	6
	Fintech Innovations in Financial Services	Nam	3
	Fixed Income Securities and Credit Markets	Mele	6
	Innovation	Munshi	3
	Mobile and Wearable Computing	Gjoreski	6
	Project Management	Gonçalves	3
	Qualitative Marketing Research and Data Analysis	Pellandini-Simányi	3
	Software Performance	Hauswirth	6
User Experience Design	Landoni, Langheinrich	6	
Founders II (only for Founders option)	Gruber	12	
Fourth Semester			
Core Course 30/18* ECTS	Master Thesis (merit-based) *	Faculty	30
Field Project 12 ECTS	Mandatory for non-Thesis and Founders Option students	Langheinrich, Pedone	12
Electives 0/18 ECTS	Critical Consumer Behaviour	Gibbert	6
	Human Resources Management	Solari	3
	Robotics	Giusti	6
	Software Quality & Testing****	Pezzè	3
	Text Analysis and Spatial Data for Economists	Parchet, D'Ambros	6
	Founders III (only for Founders option)	Gruber	12
ECTS Total			120

Management & Informatics

	Course	Instructor	ECTS
First semester			
Core Courses 12 ECTS	Enterprise Resource Planning	Cappiello	6
	Enterprise Resource Planning Lab	Plebani	3
	Project Management	Gonçalves	3
Informatics track 18 ECTS	Corporate Strategy	Martignoni, Bettinazzi	6
	Financial Accounting	Seistrajkova	3
	Managerial Accounting	Seistrajkova	3
	Orthodox and Critical Perspectives in Marketing	Mendini, Visconti	6
Management track 18 ECTS	Databases	Crestani	6
	Fundamentals of Informatics	Sharygina	6
	Introduction to Programming (Python)	Binder	6
Founders Option 6 ECTS	Competitive Intelligence	Martignoni	3
	Writing business plans	Martignoni	3
Second semester			
Core Courses 12 ECTS	Business Intelligence and Applications	Martinenghi	6
	Business Process Modeling, Management and Mining	Pautasso	3
	Operations Management	Gonçalves	3
Informatics track 6 ECTS	Business Dynamics	Gonçalves	3
	Entrepreneurship: Theory and Practice	Pieper	3
Management track 6 ECTS	Algorithms & Data Structures or Theory of Computation *	Carzaniga	6
		Sharygina	6
Electives 12 ECTS	Business Analytics	Bettinazzi	3
	Business Dynamics**	Gonçalves	3
	Critical Consumer Behaviour	Gibbert	6
	Discrete Structures**	Wolf	6
	Human Resources Management	Solari	3
	Information Security	Langheinrich	6
	Robotics	Giusti	6
	Software Quality & Testing	Pezzè	6
	Text Analysis and Spatial Data for Economists	Parchet, D'Ambros	6
	Founders I (only for Founders option)	Gruber	6

	Course	Instructor	ECTS
Third semester			
Core Courses 6 ECTS	Lean Six Sigma	Rossetti	6
Electives 24 ECTS	Analytical Thinking	Beck	3
	Digital Challenges in Marketing and Big Data	Silchenko	3
	Innovation	Munshi	3
	Organizational Design & Change	Pallotti	3
	Organizational Learning	Beck	3
	Service Design Marketing	Mandelli	3
	Distributed Systems	Chuprikov	6
	Machine Learning	Wand	6
	Mobile and Wearable Computing	Gjoreski	6
	User Experience Design	Landoni, Langheinrich	6
	Founders II (only for Founders option)	Gruber	12
	Fourth Semester		
Core Course 30/18*** ECTS	Master Thesis (merit-based)***	Faculty	30
Field Project 12 ECTS	Mandatory for non-Thesis and Founders Option students	Langheinrich, Pedone	12
Electives 0/18 ECTS	Critical Consumer Behaviour	Gibbert	6
	Discrete Structures **	n/a	3
	Human Resources Management	Solari	3
	Information Security	n/a	3
	Robotics	Giusti	6
	Software Quality & Testing	n/a	3
	Text Analysis and Spatial Data for Economists	Parchet, D'Ambros	6
	Founders III (only for Founders option)	Gruber	12
ECTS Total			120

* Only if Fundamentals of Informatics passed with at least 7.5/10

** Only for Management track students

*** The Master Thesis can be started in the 3rd semester (12 ECTS)

Software & Data Engineering

Study plan

The study programme consists of four modules:

1. **Software Engineering**
The Software Engineering module embraces 30 ECTS and provides students with a deep knowledge of state-of-the-art techniques. Topics related to this module are software design, software architecture, software performance, software analysis, domain-specific languages, and programming styles.
2. **Data Engineering**
The Data Engineering module includes three courses (18 ECTS) teaching students techniques and tools to design and model data (1st semester), to convert data into information (2nd semester), and to transform information into knowledge useful to support decision making activities (3rd semester). The topics studied in the Software and the Data Engineering modules are continuously integrated through the whole course of study. This is done by devoting 18 ECTS to deal with both Software and Data Engineering with project based learning during the Design 101, the Visual Analytics and the Software Analytics atelier.
3. **Electives**
The Elective module includes 18 ECTS, that the student can freely select from a given list of courses offered at the USI Faculty of Informatics based on their personal preference.
4. **Master Thesis**
Finally, the remaining 36 ECTS are dedicated to the MSc thesis. Students will use the 6 ECTS of the 3rd semester to visit the research groups of the Software Institute of the Faculty of Informatics and to prepare a thesis proposal. Then, they will work full time on the thesis in the 4th semester in the research group of their choice.

	Course	Instructor	ECTS
First semester			
Mandatory 24 ECTS	Data Design & Modeling	Brambilla	6
	Design 101	Lanza	6
	Engineering of Domain Specific Languages	Mocci	3
	Programming Styles	Hauswirth	3
	Software Design & Modeling	Furia	6
Electives 6 ECTS	Advanced Java Programming	Binder, Rosà	6
	Distributed Systems	Pedone	6
	High-Performance Computing	Schenk, Eftekhari	6
	Mobile and Wearable Computing	Gjoreski	6
Second semester			
Mandatory 24 ECTS	Information Modeling & Analysis	Tonella	6
	Software Analysis	Furia	6
	Software Architecture	Pautasso	6
	Visual Analytics	D'Ambros	6
Electives 6 ECTS	Advanced Networking	Carzaniga	6
	Information Security	Langheinrich	6
	Software Quality & Testing	Pezzè	6
Third semester			
Mandatory 24 ECTS	Knowledge Search & Extraction	Tonella	6
	Software Analytics	Bavota	6
	Software & Data Engineering Seminar	Faculty SI	6
	Software Performance	Hauswirth	6
Electives 6 ECTS	Advanced Java Programming	Binder, Rosà	6
	Distributed Systems	Pedone	6
	High-Performance Computing	Schenk, Eftekhari	6
	Mobile and Wearable Computing	Gjoreski	6
Fourth Semester			
Mandatory 30 ECTS	Master Thesis	Faculty	30
ECTS Total			120

PhD

Phd

Degree titles

- Doctor of Philosophy in Informatics
(Ph. D. in Informatics)
- Doctor of Philosophy in Computational Science
(Ph. D. in Computational Science)

	Course	Instructor	ECTS
Core Course	Introduction to Doctoral Studies	Binder, Wolf	2
Electives autumn	Advanced Topics in Machine Learning	Alippi, Carman	4
	Advanced Topics in Visual Computing	Didyk	3
	Algorithms & Complexity	Papadopoulou	4
	Bioinformatics	Limongelli	4
	Computational Biology and Drug Design	Limongelli	4
	Computer Aided Verification	Sharygina	4
	Data Design & Modeling	Brambilla	4
	Deep Learning Lab	Vercesi	2
	Design 101	Lanza	4
	Distributed Algorithms	Pedone	4
	Distributed Systems	Chuprikov	4
	Edge Computing in the IoT	Ferrante	2
	Emerging topics in advanced computing	Wit, Schenk, Pasadakis	2
	Engineering of Domain Specific Languages	Mocci	2
	History of Computing	Schmutterer	2
	Introduction to Data Science	Wit	4
	Introduction to Fintech	Gruber	4
	Introduction to Ordinary Differential Equations	Richter Mendoza	2
	Knowledge Search & Extraction	Tonella	4
	Lean Six Sigma	Rossetti	4
	Machine Learning	Wand	4
	Mobile and Wearable Computing	Gjoreski	4
	Numerical Algorithms	Hormann	4
	Scattered Data Approximation	Multerer	2
	User Experience Design	Landoni, Langheinrich	4

	Course	Instructor	ECTS
Electives spring	Advanced Networking	Carzaniga	4
	Business Process Modeling, Management and Mining	Pautasso	2
	Computer Architectures and Logic Design	Pozzi	4
	Computer Vision & Pattern Recognition	Hormann	4
	Data Analytics	Crestani, Postdoc	4
	Discretization Methods	Pivkin	4
	Dynamic Program Analysis	Binder, Rosà	3
	Geometric Algorithms	Papadopoulou	4
	Graph Deep Learning	Alippi	2
	Graphical Models and Network Science	Wit	4
	Information & Physics	Wolf	2
	Information Modeling & Analysis	Tonella	4
	Information Security	Langheinrich	4
	Introduction to Bayesian Learning	Mira	2
	Particle Methods	Pivkin	2
	Quantum Computing	Wolf	4
	Robotics	Giusti	4
	Security Aspects of Machine Learning	Regazzoni	2
	Software Analysis	Furia	4
	Software Engineering Research Seminar	Pautasso, Bavota, Furia, Tonella	3
	Software Quality & Testing	Pezzè	4
	Stochastic Methods	Richter Mendoza	4
	Trends in Computational Mathematics	Multerer	3

Publisher	USI Università della Svizzera italiana
Production	Faculty of Informatics
Grid design	CCRZ
Layout	Servizio grafica
Date	September 2024
Orders	USI Università della Svizzera italiana Via Buffi 13 6900 Lugano, Switzerland + 41 58 666 4000 + 41 58 666 4647 info@usi.ch www.usi.ch

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della
Svizzera
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Faculty
of
Informatics

Plan of studies
3-5-8

2024/25