



Academic year 2024-2025

# Master in Computational Science (MCS)

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## High-Performance Computing Track

### Study plan

#### 1st semester (SA 2024-2025)

Core (24 ECTS)	Lecturers	Tags	ECTS
Numerical Algorithms	Hormann		6
High-Performance Computing	Schenk, Eftekhari		6
Introduction to Data Science (MSc)	Wit		6
Introduction to Programming (Python)	Binder		6

Elective (6 ECTS)	Lecturers	Tags	ECTS
History of Computing	Schmutterer		3
Introduction to Ordinary Differential Equations	Richter Mendoza		3
Scattered Data Approximation	Multerer		3

#### 2nd semester (SP 2025)

Core (24 ECTS)	Lecturers	Tags	ECTS
Computer Architectures and Logic Design	Pozzi		6
Discretization Methods	Pivkin		6
Effective High-Performance Computing & Data Analytics	Schenk		6
Quantum Computing	Wolf		6

Elective (6 ECTS)	Lecturers	Tags	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
Optimization Methods	Sulem	6
Particle Methods	Pivkin	6
Robotics	Giusti	6

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**3rd semester (SA 2025-2026)**


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<b>Core (21 ECTS)</b>	<b>Lecturers</b>	<b>Tags</b>	<b>ECTS</b>
MCS Master thesis preparation	Eftekhari, Schenk, Wit		6
Algorithms & Complexity	Papadopoulou		6
Data Analytics for Fraud Detection	Pasadakis, Sathe		3
Distributed Algorithms	Pedone		6
Distributed Systems	Eugster		6

<b>Elective (9 ECTS)</b>	<b>Lecturers</b>	<b>Tags</b>	<b>ECTS</b>
Deep Learning Lab	Vercesi		3
Graph Deep Learning	Alippi		3
History of Computing	Schmutterer		3
Introduction to Fourier Analysis	Giacchi		3
Introduction to Ordinary Differential Equations	Richter Mendoza		3
Machine Learning (MSc)	Wand		6
Scattered Data Approximation	Multerer		3
Software Atelier: Simulation, Data Science & Supercomputing	Schenk		6

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**4th semester (SP 2026)**


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<b>Core (0 ECTS)</b>	<b>Lecturers</b>	<b>Tags</b>	<b>ECTS</b>
MCS Master thesis preparation [fuori corso]	Wit, Eftekhari, Schenk		6

<b>Elective (6 ECTS)</b>	<b>Lecturers</b>	<b>Tags</b>	<b>ECTS</b>
Advanced Networking	Carzaniga		6
Computational Fabrication	Didyk		6
Computer Vision & Pattern Recognition	Engelmann		6
Geometric Algorithms	Papadopoulou		6

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Graphical Models and Network Science	Wit	6
Information & Physics	Wolf	3
Information Security	Langheinrich	6
Particle Methods	Pivkin	6
Robotics	Giusti	6
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Thesis		24

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## Data Science Track

### Study plan

#### 1st semester (SA 2024-2025)

Core (24 ECTS)	Lecturers	Tags	ECTS
Numerical Algorithms	Hormann		6
High-Performance Computing	Schenk, Eftekhari		6
Introduction to Data Science (MSc)	Wit		6
Introduction to Programming (Python)	Binder		6

Elective (6 ECTS)	Lecturers	Tags	ECTS
History of Computing	Schmutterer		3
Introduction to Ordinary Differential Equations	Richter Mendoza		3
Machine Learning (MSc)	Wand		6
Scattered Data Approximation	Multerer		3

#### 2nd semester (SP 2025)

Core (24 ECTS)	Lecturers	Tags	ECTS
Graphical Models and Network Science	Wit		6
Stochastic Methods	Richter Mendoza		6
Effective High-Performance Computing & Data Analytics	Schenk		6
Graph Deep Learning	Alippi		3
Introduction to Bayesian Learning	Mira		3

Elective (63 ECTS)	Lecturers	Tags	ECTS
Computer Vision & Pattern Recognition	Hormann		6
Data Analytics	Crestani, Bucur-Cosma		6
Data Management	Eugster		6
Discretization Methods	Pivkin		6
Geometric Algorithms	Papadopoulou		6
Information & Physics	Wolf		3
Information Security	Langheinrich		6
Optimization Methods	Sulem		6
Particle Methods	Pivkin		6
Quantum Computing	Wolf		6
Text Analysis and Spatial Data for	Parchet, D'Ambros		6

Economists

**3rd semester (SA 2025-2026)**

<b>Core (15 ECTS)</b>	<b>Lecturers</b>	<b>Tags</b>	<b>ECTS</b>
MCS Master thesis preparation	Eftekhari, Schenk, Wit		6
Data Analytics for Fraud Detection	Pasadakis, Sathe		3
Analysis of Social Networks	Lomi, Bianchi		6
Bioinformatics	Limongelli		6
Graph Deep Learning	Alippi		3

<b>Elective (15 ECTS)</b>	<b>Lecturers</b>	<b>Tags</b>	<b>ECTS</b>
Algorithms & Complexity	Papadopoulou		6
Computational Biology and Drug Design	Limongelli		6
Deep Learning Lab	Vercesi		3
Distributed Algorithms	Pedone		6
History of Computing	Schmutterer		3
Introduction to Fourier Analysis	Giacchi		3
Introduction to Ordinary Differential Equations	Richter Mendoza		3
Machine Learning (MSc)	Wand		6
Scattered Data Approximation	Multerer		3
Software Atelier: Simulation, Data Science & Supercomputing	Schenk		6

**4th semester (SP 2026)**

<b>Core (0 ECTS)</b>	<b>Lecturers</b>	<b>Tags</b>	<b>ECTS</b>
MCS Master thesis preparation [fuori corso]	Wit, Eftekhari, Schenk		6

<b>Elective (57 ECTS)</b>	<b>Lecturers</b>	<b>Tags</b>	<b>ECTS</b>
Computer Vision & Pattern Recognition	Engelmann		6
Data Analytics	Crestani, Bucur-Cosma		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

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Text Analysis and Spatial Data for Parchet, D'Ambros Economists	6
Thesis	24

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