Assessment plan for the curriculum of the Master's degree programme in Computing Science, 2025-2026

Programme director: Vasilios Andrikopoulos

Date advice Board of Examiners:

Submission date to Faculty Board:

1. Vision on assessment

1. to enable students to independently show academic skills in a professional context (why), assessment will include activities that require individual and collaborative performance, which each have a substantial contribution to the final grade (what)
2. to install students with the scientific skills essential for contributing to one of the research themes on which the associated research groups are working (why), authentic assessment will be implemented where possible (what)
3. to prepare students for a career in research or design at academia or in an (internationally operating) company (why), assessment is designed to test students independent ability to design and evaluate new computer systems and software in an international and pluricultural context (what)

2. Assessment guidelines

1. Every course has at least one mandatory summative element onsite; overall, assessment can be organized either online or onsite.
2. The formative and summative assessments are designed by the course coordinator in such a way that the assessment covers all the intended learning outcomes of the course.
3. Summative assessments in the form of final exams are designed by the course coordinator and are peer reviewed by the second examiner in order to ensure that the exam assesses the course material representatively and sufficiently.
4. Assessment in the form of an oral exam or project presentation is always carried out in the presence of at least 2 examiners (or an examiner and at least one additional expert in the corresponding discipline).
5. All practical work of students should establish a quick (e.g., weekly) feedback loop via formative or summative assessment.
6. Practical work of students should also assess their teamwork and collaboration skills where applicable.
7. Automated testing should be used to increase the amount of formative assessment whenever possible.
8. Courses that have graded components such as assignments that are affected by the use of Generative AI models should either incorporate the adoption of these models in the ILOs for the course; alternatively, course coordinators should consider making these components pass/fail or move completely to formative assessments.
9. The use of Generative AI on behalf of assessors follows the guidelines for the use of 3rd party services at the University with respect to preserving the privacy of students and the intellectual property of the University.

3. Learning outcomes of the degree programme

	Learning Outcome (General) *At the end of the programme, the graduate …*
G1	Is fully acquainted with the basic terms and techniques used in Computing Science, and is familiar with a number of classical problems and their solutions;
G2	Is experienced in the effective use of the tools available in solving Computing Science problems, such as compilers, theorem provers, visualisation software, case-tools and domain specific software and hardware;
G3	Is familiar with Computing Science applications in several other scientific fields of study;
G4	Is capable of clear communication (both oral and in writing) on the subject of Computing Science and its applications;
G5	Is capable of working in a team and in various projects;
G6	Is sensitive to the social aspects of Computing Science applications and their own responsibilities therein;
G7	Has specialized knowledge of theories, methods and techniques in one of the following subfields of Computing Science: a. Machine Learning and Visual Computing b. Software Engineering and Distributed Systems c. AI Engineering

	d. Science, Business & Policy;
G8	Is able, by using scientific data and assessments, to analyse problems in Computing Science or a related scientific field of study, to provide specified solutions to the problem, and – if possible – to materialise these solutions (in the shape of an algorithm or program or an implementation in software or hardware);
G9	Is able to critically read professional literature and to assess its correctness, usability and relevance;
G10	Is able to contribute to the enhancement of scientific understanding in a subfield of Computing Science;
G11	Has a proper understanding of the scientific relevance of problem definitions and results, and of the validity of the scientific method used.
G12	Has the ability to design and implement software, integrating and reusing existing components where necessary, into a solution or system that meets quality criteria agreed upon with interested parties.

	Learning Outcome (Science, Business & Policy) *At the end of the programme, the graduate ...*
M1	Has a full understanding of the way in which businesses and policy organisations are functioning (governments and nongovernmental organisations, NGO's);
M2	Understands the connections between natural science research, trade and industry and governmental policies;
M3	Is able to integrate aspects of natural science, business and management;
M4	Is able to translate a concrete problem definition in business or management into a natural science problem definition;
M5	Is able to connect problem aspects of natural sciences to other relevant subject fields;
M6	Is able to put research data and conclusions into a business or policy context;
M7	Has developed their social and communicative skills;
M8	Is able to write texts that are effective and to the point;
M9	Is able to draw up an innovation plan or management plan for either a business or a government organisation;
M10	Is able to give convincing oral presentation;
M11	Is able to deliver an active contribution to plenary discussions;
M12	Familiar with techniques used in business meetings and is capable of chairing a meeting;
M13	Is able to work on a project as part of a team;
M14	Is able to give and receive feedback concerning their way of functioning in a team;
M15	Can work in a project;
M16	Is able to fully consider the interests or objectives of the ordering customer;
M17	Is able to plan a project independently;
M18	Is able to cooperate with the relevant parties involved in the project;
M19	Is able to adequately deal with limitations in time, information and means;
M20	Is able to prepare the implementation of a project result;
M21	Is capable of taking professional responsibility;
M22	Is able to take responsibility on behalf of the organisation;
M23	Is able to recognize the strategic aspects of their own project;
M24	Is able to provide practical solutions in matters concerning the ethical and professional codes of their own field of expertise and of the professional organisation.

4. Overview of assessment methods, test moments for course units, and examiners

This table shows all the course units for each year of the programme and assessment methods.

Year	Period	Course	Code	EC	Assessment methods	Does (part of the) assessment have a formative function?	First examiner	Second examiner
	1A	Models and Semantics of Computation	WMCS026-05	5	R, P, AST	Yes	J. Perez	D. Frumin
	1A	Cloud Computing and Cloud-based Applications	WMCS032-05	5	WE, PR	No	V. Andrikopoulos	A. Lazovik
	1A	Software Architecture	WMCS004-05	5	P, PR	No	P. Avgeriou	D. Feitosa
	1A	Advanced Topics in Security and Privacy	WMCS001-05	5	WE, R, AST	Yes	F. Turkmen	F. Mohsen
	1A	Network Security Analytics	WMCS036-05	5	R, P, PR	Yes	F. Mohsen	F. Turkmen
	1A	Introduction to Data Science	WMCS002-05	5	WE, AST	No	K. Bunte	E.Wilhelm
	1A	Social Network Analysis	WMCS028-05	5	R, P, PR	Yes	M. Riveni	G. Azzopardi
	1A	Modelling and Simulation	WMCS003-05	5	WE, R	No	M. Wilkinson	M. Biehl
	1B	Scientific Visualization	WMCS018-05	5	WE, PR	No	S. Frey	J. Kosinka
	1A	Robotic State Estimation	WMCS040-05	5	WE, AST	No	K. Li	J. Guo
	1A	Perception for Visual Computing	WMCS029-05	5	R, P, AST	Yes	C. Tursun	J. Kosinka
	1A	Performance Engineering	WMCS045-05	5	WE, AST, R	Yes	D. Pleiter	A.Lazovik
	1A	Embedded Systems	WMCS050-05	5	WE, AST, PR	Yes	R. Hassanpour	D.Pleiter
	1A	Kernel Engineering and Security	WMCS051-05	5	OR, PR	No	F. Westerman	D.Pleiter
	1B	Modal Logic and Proof Theory	WMCS027-05	5	AST	Yes	H. Hansen	R. Ramanayake
	1B	Software Language Engineering	WMCS037-05	5	WE	No	T. van der Storm	P. Avgeriou
	1B	Software Maintenance and Evolution	WMCS013-05	5	AST	No	A. Capiluppi	A. Rastogi
	1B	Evidence-Based Software Engineering	WMCS024-05	5	P, PR	No	P. Avgeriou	A. Rastogi
	1B	Enterprise Application Integration	WMCS007-05	5	P, AST	No	M. Riveni	D. Karastoyanova
	1B	Information Systems	WMCS009-05	5	WE, PR	No	D. Karastoyanova	M.Riveni
	1B	Ethical Hacking	WMCS030-05	5	R, P, PR	Yes	F. Mohsen	F. Turkmen
	1B	Pattern Recognition for CS	WMCS011-05	5	WE, PR	No	J. Guo	M. Biehl
	1B	Neural Networks and Computational Intelligence	WMCS010-05	5	WE, R	Yes	M. Biehl	J. Guo
	1B	Advanced Computer Graphics	WMCS006-05	5	R, P, PR, AST	Yes	J. Kosinka	S. Frey
	1A	Geo-Visualization	WMCS035-05	5	R, P	No	C. Kehl	J. Kosinka
	1B	Machine Learning Systems Deployment and Operations	WMCS039-05	5	R, P, AST	No	D. Feitosa	D. Dustegor
	1B	Intelligent Mobile Perception in Practice	WMCS042-05	5	R, P	No	K. Li	J.Guo
	1B	Hardware Security	WMCS043-05	5	R, P	No	F. Merchant	F. Turkmen
	1B	Advanced Distributed Systems	WMCS044-05	5	WE, P, PR, AST	Yes	K. Haghshenas	A. Lazovik
	1B	Multi-scale and Advanced Image Analysis	WMCS047-05	5	WE, R, PR	Yes	M. Wilkinson	G. Azzopardi
	1B	Data Challenges in AI Systems	WMCS048-05	5	WE, R, P, AST	No	D. Dustegor	D.Feitosa

Year	Period	Course	Code	EC	Assessment methods	Does (part of the) assessment have a formative function?	First examiner	Second examiner
1	2A	Student Colloquium	WMCS019-05	5	R, P, PR	No	A. Lazovik	[supervising lecturers]
2	2A-2B	Master Thesis	WMCS901-30	30	R, P, PR	No	[supervising lecturers]	[supervising lecturers]
	2A	Software Analytics	WMCS031-05	5	R, P, AST	Yes	A. Rastogi	P. Avgeriou
	2A	Advanced Software Architecture	WMCS025-05	5	R, AST	No	M. Stal	P. Avgeriou
	2A	Programs and Interactive Proofs	WMCS033-05	5	P, PR, AST	No	D. Frumin	J. Perez
	2A	Scalable Computing	WMCS017-05	5	WE, PR	No	A. Lazovik	A. Tsyganov
	2A	Software and System Security	WMCS034-05	5	WE, R, AST	Yes	F. Turkmen	F. Mohsen
	2A	Theory of Machine Learning	WMCS038-05	5	WE, AST	No	K. Bunte	G.Azzopardi
	2A	Multimodal Mobile Sensing	WMCS041-05	5	WE, AST	No	K. Li	J. Guo
	2A	Computer Vision	WMCS015-05	5	WE, R, PR	No	M.Wilkinson	G.Azzopardi
	2A	Algorithms for Computationally Challenging Problems	WMCS049-05	5	WE, AST, MC	Yes	I. Bliznets	D. Frumin
	2A	Emerging Computer Architectures	WMCS046-05	5	WE, AST	Yes	D. Pleiter	F. Merchant
1	2B	Research or In-Company Internship	WMCS021-15	15	AST	No	[supervising lecturers]	V. Andrikopoulos

The abbreviations for the relevant teaching methods are explained in the legend of the table.
Examples of assessment methods include:

5. *Written Exam (WE)*
6. *Multiple Choice (MC)*
7. *Oral Exam (OR)*
8. *Report (R)*
9. *Presentation (P)*
10. *Practical Work (PR)*
11. *Assignment (AST)*

The assessment method defines the test moments; practical work, assignments are continuous. The rest are final and in some cases halfway.

12. Relationship between course units and details of the learning outcomes

An X means that the learning outcome is explicitly assessed (not merely addressed) in the course.

		Learning outcomes of the degree programme													
		G	G	G	G	G	G	MLVC	SEDS	AI Eng	G	G	G	G	G
		1	2	3	4	5	6	7	7	7	8	9	10	11	12
Period	**Course**	**Year 1 compulsory courses**													
2A	Student Colloquium				X	X	X	X	X	X	X	X	X	X	
2B	Research or In-company Internship	X	X		X	X	X	X	X	X	X		X	X	X
Period	**Course**	**Year 2 compulsory courses**													
2A-2B	Master Thesis	X	X		X			X	X	X	X	X	X	X	X
Period	**Course**	**Elective courses**													
1A	Models and Semantics of Computation	X	X		X				X		X	X		X	X
1A	Cloud Computing and Cloud-based Applications	X	X			X		X	X	X	X			X	X
1A	Software Architecture	X	X		X	X			X		X	X	X	X	X
1A	Advanced Topics in Security and Privacy	X				X			X	X	X			X	
1A	Network Security Analytics	X	X			X			X		X			X	
1A	Introduction to Data Science	X		X	X	X	X	X	X	X	X			X	
1A	Social Network Analysis	X				X	X	X	X	X		X		X	
1A	Modelling and Simulation			X	X	X	X	X		X	X	X	X	X	
1B	Scientific Visualization	X	X	X		X		X	X	X	X	X		X	X
1A	Robotic State Estimation	X		X	X			X		X	X	X	X	X	X
1A	Perception for Visual Computing	X	X			X		X		X	X	X	X	X	
1A	Performance Engineering	X	X	X		X			X	X	X			X	
1A	Embedded Systems		X	X		X			X	X				X	X
1A	Kernel Engineering and Security	X	X			X			X			X		X	X
1B	Modal Logic and Proof Theory	X							X				X	X	
1B	Software Language Engineering	X	X			X			X		X			X	X
1B	Software Maintenance and Evolution	X	X			X	X		X		X			X	X
1B	Evidence-Based Software Engineering				X	X			X		X	X	X	X	
1B	Enterprise Application Integration	X	X			X			X	X	X			X	X
1B	Information Systems	X			X	X			X		X	X	X	X	
1B	Ethical Hacking	X	X	X	X	X	X		X	X	X	X	X	X	
1B	Pattern Recognition for CS	X	X	X		X	X	X		X	X	X	X	X	X
1B	Neural Networks and Computational Intelligence	X	X	X	X	X	X	X		X	X			X	
1B	Advanced Computer Graphics	X	X	X	X	X		X			X	X		X	
1B	Intelligent Mobile Perception in Practice	X	X	X	X	X	X	X		X	X	X	X	X	

		Learning outcomes of the degree programme													
1B	Geo-Visualization		X	X	X	X	X	X			X	X		X	X
1B	Machine Learning Systems Deployment and Operations	X	X			X			X	X	X				
1B	Advanced Distributed Systems	X	X			X			X		X	X		X	
1B	Multi-scale and Advanced Image Analysis		X	X		X		X		X	X			X	X
1B	Data Challenges in AI Systems	X	X	X	X	X	X	X	X	X	X	X		X	
1B	Hardware Security		X		X				X	X	X	X			
2A	Software Analytics	X			X	X	X		X		X	X		X	X
2A	Advanced Software Architecture				X	X	X		X		X	X	X	X	X
2A	Programs and Interactive Proofs		X		X	X			X		X	X		X	
2A	Scalable Computing	X	X			X		X	X	X	X			X	X
2A	Software and System Security	X	X		X	X			X		X			X	X
2A	Theory of Machine Learning	X	X		X	X	X	X			X			X	
2A	Multimodal Mobile Sensing	X	X	X	X	X		X		X	X	X	X	X	X
2A	Computer Vision	X	X	X		X		X		X	X			X	
2A	Algorithms for Computationally Challenging Problems	X							X		X	X	X	X	
2A	Emerging Computer Architectures		X	X		X			X	X		X	X		X

The relation between study components and the learning outcomes in the subfield of Science, Business & Policy (learning outcomes M1-M24) can be found in the assessment plan of the SBP track

13. List of Examiners for the Master Computing Science 2025-2026

Name	Examiner Master thesis	Course examiner
prof. dr. V. Andrikopoulos	X	X
prof. dr. P. Avgeriou	X	X
dr. G. Azzopardi	X	X
dr. M. Babai	X	X
prof. dr. M. Biehl	X	X
prof dr. K. Bunte	X	X
prof. dr. A. Capiluppi	X	X
dr. D. Düstegör	X	X
dr. D. Feitosa	X	X
dr. S.D. Frey	X	X
dr. J. Guo	X	X
prof. dr. H.H. Hansen	X	X
prof. dr. D. Karastoyanova	X	X
prof. dr. J. Kosinka	X	X
prof. dr. A. Lazovik	X	X
dr. A. Meijster	X	X
dr. F.F.M. Mohsen	X	X
prof. dr. J.A. Perez Parra	X	X
dr. D.R.S. Ramanayake	X	X
dr. A. Rastogi	X	X
dr. M. Riveni	X	X
prof. dr. M. Stal	X	X
dr. C. Tursun	X	X
prof. dr. T. van der Storm	X	
dr. F. Turkmen	X	X
dr. M.H.F. Wilkinson	X	X
dr. A.E. Tatar	X	X
dr. B. Setz	X	
dr. K. Haghshenas	X	X
dr. H. Groefsema	X	X
dr. I. Bliznets	X	X
dr. K. Li	X	X
dr. F.A. Merchant	X	X
dr. S.K. Pandey	X	X
dr. C. Kehl	X	X
dr. D. Frumin	X	X
dr. R. Zare Hassanpour	X	X
prof.dr. D.H. Pleiter	X	X
dr. A. Tsyganov	X	X

Name	Examiner Master thesis	Course examiner
F.P. Westerman		X
D.J. Visscher		X
prof. dr. N. Petkov	X	
prof. dr. G.R. Renardel de Lavalette	X	
prof. dr. J.B.T.M. Roerdink	X	
dr. R. Smedinga	X	

For thesis projects and internships, PhD students and Postdocs can serve as second examiner.