UNIVERSITY OF DEBRECEN, FACULTY OF INFORMATICS

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Computer Science MSc

curriculum – 2021

Debrecen
2025/2026.

COMPUTER SCIENCE MSC CURRICULUM

Mode:	Full-time training
Program Coordinator:	Dr. György Vaszil (vaszil.gyorgy@inf.unideb.hu)
Mentor:	Dr. Norbert Oláh (olah.norbert@inf.unideb.hu)

Qualification requirements

General requirements of the diploma are regulated by The Rules and Regulations of The University of Debrecen.

Work and Fire Safety and Physical Education

The courses of „Work and Fire Safety" and „Physical Education" are worth 1 - 1 credit, which must be completed in excess of the number of credits required for the diploma as specified in the training and outcome requirements of the degree.

Diploma credit requirements:

Mathematical and computer sciences:		36 credits
compulsory courses:		21 credits
Elective courses:		15 credits
Informatical sciences:		42 credits
compulsory courses:		15 credits
Elective courses:		27 credits
Professional Training:	9 credits	
Elective knowledge („Mathematical and computer sciences" or „Informatical")		6 credits
Thesis work:		30 credits
Free choice:		6 credits
Total:		**120 credits**
Work and Fire Safety Training:		1 credit
Physical Education (1 semester):		1 credit

Professional training/Internship requirements

Professional training is a practice which is completed at a competent training place. It lasts for at least 6 weeks and 240 work hours.

It is a must to complete Professional training subject to issue the absolutorium (pre-degree certificate).

https://inf.unideb.hu/en/professional-training

Student can apply for Professional training after completing at least one semester.

Faculty of Informatics annex to the Academic and Examination Rules and Regulations of the University of Debrecen contains the procedure of the professional training.

The Thesis

During the studies, Student must write a thesis. Writing a thesis is a diploma requirement.

Thesis subject is mandatory to complete. The prerequisites to register for the Thesis subject are the followings:

- chose a thesis topic by the deadline.

  (Together with the supervisor the candidate writes a work plan in the maximum of two pages. The work plan describes the aim of the work, areas of expertise and the scheduling of the work.)

- the chosen topic is approved by the Educational Committee
- at least 30 completed credits.

Final Exam / State Exam

a., Requirements for Final Exam

1. Complete all the 120 credits required by the curriculum of program specialisation to have the degree of MSc program
2. Carry out the internship
3. Write and submit the Diploma Thesis

b., Process of the Final Exam

The Final Exam consists of an oral part only and the purpose is to examine the coherence of the professional knowledge.

F. The average from the grades of the oral exam (rounded to a whole number) consists of an item of the Mathematical and computer sciences knowledge and an item of the Informatical sciences knowledge. If the grade for any item is failed, the grade is failed, and the final examination is failed.

D1. Thesis defence. During the defence the candidate has to sum up the Thesis in a short presentation then s/he answers the questions from the referee of the Thesis and the members of the Committee.

D2. The grade for the thesis, which is determined by the Final Examination Committee taking into account the grade proposed by the thesis assessor.

Calculation of the final examination grade (**ZV**): ZV = (F+D1+D2)/3

If the grade D2 is failed, the candidate will not be allowed to sit the final examination.

If any of the grades of F or D1 are unsatisfactory, the final exam is also unsatisfactory. Only the component graded as unsatisfactory must be retaken in the retake of the final examination.

Grade of Diploma:

Diploma grade: in the case of a successful final examination, it is determined based on the average of the following results:

a) **SZ**: Average of the grades for the Thesis subject, the grade for the thesis assessment and the grades for the thesis defence in the final examination, rounded to two decimal places.

b) **F**: Average of the grades obtained in the final examination, rounded to a whole number.

c) **T**: the credit-weighted average of all compulsory and optional professional subjects completed during the course, except for 'Thesis 1' and 'Thesis 2', rounded to two decimal places

Diploma grade = (0,3*SZ+0,2*F+0,5*T)

Based on the above average result, the qualification of the diploma is determined by the University of Debrecen's Academic and Examination Regulations, Section 31 (7).

The diploma shall be assessed based on the calculation of the grade average as follows:

outstanding	4,81-5,00
excellent	4,51-4,80
good	3,51-4,50
satisfactory	2,51-3,50
pass	2,00-2,50

Mathematical and computer sciences, compulsory courses – needed 21 credits

Code	Subject name	Credit	Type and number			Assessment	Prerequisites	Period	Semester
			lec.	practice					
				sem.	lab				
INMPA0101-17 INMPA0101E INMPA0101G	Machine learning basics	6	2	2		E S			1
INMPA0102-21 INMPA0102E	Algorithms	3	2			E			1
INMPA0103-21 INMPA0103E INMPA0103L	Cryptography	6	2		2	E S			1
INMPA0205-17 INMPA0205E INMPA0205L	Optimization algorithms	6	2		2	E S			2

Informatical sciences, compulsory courses – needed 15 credits

Code	Subject name	Credit	Type and number			Assessment	Prerequisites	Period	Semester
			lec.	practice					
				sem.	lab				
INMPA0104-17 INMPA0104E	Information systems	3	2			E			1
INMPA0206-17 INMPA0206E INMPA0206L	Data mining	6	2		2	E S			2
INMPA0207-17 INMPA0207E INMPA0207L	Computer graphics	6	2		2	E S			2

Thesis work – needed 30 credits

Code	Subject name	Credit	Type and number			Assessment	Prerequisites	Period	Semester
			lec.	practice					
				sem.	lab				
INMPA0308-17 INMPA0308L	Thesis 1	15			10	PM			3
INMPA0409-17 INMPA0409L	Thesis 2	15			10	PM			4

Mathematical and computer sciences, elective courses – needed 15 credits

Code	Subject name	Credit	Type and number			Assessment	Prerequisites	Period	Semester
			lec.	practice					
				sem.	lab				
INMPA9910-17 INMPA9910L	Operation research	3			2	PM			1
INMPA9911-17 INMPA9911E INMPA9911G	Advanced inference methods	6	2	2		PM			2
INMPA9912-17 INMPA9912E	Logical algorithms	3	2			E			2
INMPA9913-17 INMPA9913E	Geometric modelling	3	2			E	INMPA0207-17		3

Code	Subject name	Credit	Type and number			Assessment	Prerequisites	Period	Semester
			lec.	practice					
				sem.	lab				
INMPA9914-17 INMPA9914E	Coding theory	3	2			E			3
INMPA9915-17 INMPA9915E	Theory of neural networks	3	2			E	INMPA0205-17		3
INMPA9916-17 INMPA9916E	Models of computation	3	2			E			3
INMPA9917-21 INMPA9917E INMPA9917L	Declarative programming	6	2		2	E S			4

Informatical sciences, elective courses – needed 27 credits

(At least one course from „Data science" block and one course from „Information systems" block)

Professional Training

Code	Subject name	Credit	Type and number			Assessment	Prerequisites	Period	Semester
			lec.	practice					
				sem.	lab				
INMPA9997-21 INMPA9997G	Professional Training	9				PM			3

„Data science" block

Code	Subject name	Credit	Type and number			Assessment	Prerequisites	Period	Semester
			lec.	practice					
				sem.	lab				
INMPA9918-21 INMPA9918L	Geoinformatics	3			2	PM			1
INMPA9919-17 INMPA9919L	Advanced cloud computing	3			2	PM			2
INMPA9920-17 INMPA9920E INMPA9920L	Image processing and medical imaging	6	2		2	PM			2
INMPA9921-17 INMPA9921E INMPA9921L	Visualization and visual analytics	6	2		2	E S	INMPA0207-17		3
INMPA9922-17 INMPA9922L	Data science lab	3			2	PM	INMPA0101-17		4
INMPA9923-17 INMPA9923E INMPA9923L	Advanced machine learning	6	2		2	E S	INMPA0101-17		4
INMPA9932-21 INMPA9932E INMPA9932L	Advanced reinforcement learning	6	2		2	E S	INMPA0101-17	I	

„Information systems" block

Code	Subject name	Credit	Type and number			Assessment	Prerequisites	Period	Semester
			lec.	practice					
				sem.	lab				
INMPA9925-17 INMPA9925E INMPA9925L	Advanced XML technologies	6	2		2	PM			1
INMPA9926-17 INMPA9926L	NoSQL databases	3			2	PM			1
INMPA9927-17 INMPA9927L	Sensor networks and the internet of things	3			2	PM			1
INMPA9924-17 INMPA9924L	Advanced software architecture patterns	3			2	PM			3
INMPA9929-17 INMPA9929L	Text- and webmining	3			2	PM	INMPA0206-17		3
INMPA9930-17 INMPA9930L	Information systems in practice	3			2	PM	INMPA0104-17		4
INMPA9931-17 INMPA9931E INMPA9931L	Advanced software engineering	6	2		2	E S			4
INMPA9933-21 INMPA9933L	Software Engineering in the Industry	3			2	PM		I	
INMPA9934-21 INMPA9934L	Tools of parallel programming	3			2	PM		I	
INMPA9935-21 INMPA9935L	Rust: memory safe programming	3			2	PM		I	

Free choice – needed 6 credit

Code	Subject name	Credit	Type and number			Assessment	Prerequisites	Period	Semester
			lec.	practice					
				sem.	lab				

* "Free choice" - Professional electives offered by the Faculty of Informatics and institutional electives offered by other faculties of the University of Debrecen.

Work and Fire Safety and Physical Education – needed 2 credits

must be completed in excess of the number of credits required
for the diploma as specified in the training and outcome requirements of the degree

Code	Subject name	Credit	Type and number			Assessment	Prerequisites	Period	Semester
			lec.	practice					
				sem.	lab				
	Work and Fire Safety	1				PM			1
	Physical Education	1				PM			

Exam types: E exam
S signature
PM practical mark