



**UNIVERSITY OF DEBRECEN, FACULTY OF INFORMATICS**



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# **Computer Science MSc curriculum – 2021**

**Debrecen  
2024/2025.**

## COMPUTER SCIENCE MSc CURRICULUM

### 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
<b>Total:</b>	<b>120 credits</b>
Work and Fire Safety Training:	1 credit
Physical Education (1 semester):	1 credit

### Mathematical and computer sciences, compulsory courses – needed 21 credits

Code	Subject name	Cre- dit	Type and number			Asses- ment	Prerequisites	Period	Semes- ter
			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			Asses-ment	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			Asses-ment	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			Asses-ment	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	
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	

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

Exam types: E exam  
S signature  
PM practical mark