UNIVERSITY OF DEBRECEN, FACULTY OF INFORMATICS

H-4028 Debrecen, Kassai Road 26., H-4002 Debrecen, P.O. box 400.
☎ 52/518-630, to@inf.unideb.hu

Artificial Intelligence MSc

curriculum – 2026

Debrecen
2026/2027.

ARTIFICIAL INTELLIGENCE MSC CURRICULUM

Mode:	Full-time training
Program Coordinator:	Dr. Balázs Harangi (harangi.balazs@inf.unideb.hu)
Mentor:	Dr. Gergő Bogacsovics (bogacsovics.gergo@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:

Mathematics and Natural Science:	18 credits
Informatics and Artificial Intelligence compulsory topics:	24 credits
Differentiated knowledge topics:	42 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). 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

Mathematics and Natural Science – needed 18 credits

Code	Subject name	Credit	Type and number			Assessment	Prerequisites	Period	Semester
			lec.	practice					
				sem.	lab				
INMEA0101-26 INMEA0101E	Mathematical Foundations of Artificial Intelligence	3	2			E			1
INMEA0102-26 INMEA0102E INMEA0102L	Statistical Analysis of Artificial Intelligence Methods	6	2		2	E S			1
INMEA0103-26 INMEA0103L	Advanced Optimization Methods	3			2	PM			1
INMEA0104-26 INMEA0104E	Theory of Neural Networks	3	2			E			1
INMEA0207-26 INMEA0207L	Operations Research	3			2	PM			2

Informatics and Artificial Intelligence compulsory topics – needed 24 credits

Code	Subject name	Credit	Type and number			Assessment	Prerequisites	Period	Semester
			lec.	practice					
				sem.	lab				
INMEA0105-26 INMEA0105E INMEA0105L	Machine Learning	6	2		2	E S			1
INMEA0106-26 INMEA0106L	Advanced Machine Learning Models	3			2	PM			1
INMEA0208-26 INMEA0208E INMEA0208L	Deep Learning	6	2		2	E S			2
INMEA0209-26 INMEA0209L	Natural Language Processing and Speech Processing	3			2	PM			2
INMEA0210-26 INMEA0210L	Generative Artificial Intelligence	3			2	PM			2
INMEA0211-26 INMEA0211L	AI engineering / MLOps	3			2	PM			2

Thesis work – needed 30 credits

Code	Subject name	Credit	Type and number			Assessment	Prerequisites	Period	Semester
			lec.	practice					
				sem.	lab				
INMEA0312-26 INMEA0312L	Thesis 1	15				PM			3
INMEA0413-26 INMEA0413L	Thesis 2	15				PM			4

Differentiated knowledge topics – needed 42credits

Code	Subject name	Cre-dit	Type and number			Asses-ment	Prerequisites	Period	Semes-ter*
			lec.	practice					
				sem.	lab				
INMEA9914-26 INMEA9914L	Explainable AI	3			2	PM			3
INMEA9915-26 INMEA9915E INMEA9915L	AI and cybersecurity	6	2		2	E S			4
INMEA9916-26 INMEA9916E	AI Ethics and Governance	3	2			E			2
INMEA9917-26 INMEA9917L	Visualization and Visual Analytics	3			2	PM			3
INMEA9918-26 INMEA9918L	Graph-based neural networks	3			2	PM			3
INMEA9919-26 INMEA9919L	Simulations – Digital Twin	3			2	PM			3
INMEA9920-26 INMEA9920E INMEA9922L	Reinforcement learning	6	2		2	E S			2
INMEA9921-26 INMEA9921L	Distributed AI Systems	3			2	PM			3
INMEA9922-26 INMEA9922L	Multimodal AI Tools	3			2	PM			3
INMEA9923-26 INMEA9923L	Data Mining	3			2	PM			2
INMEA9924-26 INMEA9924L	Advanced Data Management	3			2	PM			3
INMEA9925-26 INMEA9925E INMEA9925L	Computer Vision	6	2		2	E S			2
INMEA9926-26 INMEA9926L	Text and Web Mining	3			2	PM			3
INMEA9927-26 INMEA9927L	Fundamentals of Robotics	3			2	PM			3
INMEA9928-26 INMEA9928L	AI in Health Sciences	3			2	PM			4
INMEA9929-26 INMEA9929L	AI in physics	3			2	PM			4
INMEA9930-26 INMEA9930L	Docker and Kubernetes for AI	3			2	PM			2
INMEA9931-26 INMEA9931L	Advanced Cloud Computing	3			2	PM			2
INMEA9932-26 INMEA9932L	Tools for parallel programming	3			2	PM			3
INMEA9933-26 INMEA9933L	Software Develop-ment in Industrial Environments	3			2	PM			3
INMEA9934-26 INMEA9934L	Theoretical and Neural Models in the Industry	3			2	PM			3
INMEA9935-26 INMEA9935L	Effective AI: Opti-mization Techniques	3			2	PM			3

* The recommended semester can be changed occasionally.

Free choice – needed 6 credits

Code	Subject name	Cre-dit	Type and number			Asses-ment	Prerequisites	Period	Semes-ter
			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 / Physical Education / Professional Training

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	Cre-dit	Type and number			Asses-ment	Prerequisites	Period	Semes-ter
			lec.	practice					
				sem.	lab				
	Work and Fire Safety	1				PM			1
	Physical Education	1				PM			
INMEA9997-26 INMEA9997G	Professional Training	0				S			3

Exam types:
E exam
S signature
PM practical mark