M.S. in Artificial Intelligence

Degree Requirements

Students in the Master of Science in Artificial Intelligence (MSAI) program must successfully complete 30 credits based on any of the following options:

Courses (30 credits)

Courses (27 credits) + MS Project (3 credits)

Courses (24 credits) + MS Thesis (6 credits)

Independent of the chosen option, 4 out of 7 core courses are required (detailed below).

If a student chooses the MS thesis option, the thesis must be related to Artificial Intelligence and requires approval from the Program Director.

Students may choose an elective outside the list after approval of their respective advisor.

M.S. in Artificial Intelligence

Core Course Requirements

Students are required to take four (4) core courses from the following list.

Code	Title	Credits
DS 675	Machine Learning	3
DS 680	Natural Language Processing	3
DS 669	Reinforcement Learning	3
DS 789	Trustworthy Artificial Intelligence	3
DS 677	Deep Learning	3
CS 670	Artificial Intelligence	3
CS 634	Data Mining	3

Electives

Code	Title	Credits
CS 631	Data Management System Design	3
CS 632	Advanced Database System Design	3
CS 659	Image Processing and Analysis	3
CS 681	Computer Vision	3
CS 708	Advanced Data Security and Privacy	3
CS 732	Advanced Machine Learning	3
CS 735	High Performance Analytics Dat	3
CS 744	Data Mining and Management in Bioinformatics	3
CS 782	Pattern Recognition and Applications	3
CS 786	Seminar in Computer Science II (Deep Learning on Graphs)	3
IS 687	Transaction Mining and Fraud Detection	3
IS 688	Web Mining	3
MATH 644	Regression Analysis Methods	3
MATH 665	Statistical Inference	3
MATH 678	Stat Methods in Data Science	3
MATH 680	Advanced Statistical Learning	3
MATH 699	Design and Analysis of Experiments	3
ECE 605	Discrete Event Dynamic Systems	3
ECE 754	Statistical Machine Learning for Engineers and Data Scientists	3
ECE 776	Information Theory	3
ECE 788	Selected Topics in Electrical and Computer Engineering (Computational Intelligence)	3

Sample course sequence M.S. in Artificial Intelligence

Year 1 Fall:

- CS 675 Machine Learning
- CS 634 Data Mining
- CS 670 Artificial Intelligence

Year 1 Spring:

- DS 677 Deep Learning
- DS 680 Natural Language Processing
- DS 669 Reinforcement Learning

Year 2 Fall:

- DS 789: Trustworthy AI
- Free elective or Master project course
- Free elective

Year 2 Spring:

- Free elective or Master thesis course
- Free elective or Master project course
- Free elective

The requirements for the MS in Artificial Intelligence program are as follows:

·   30 credits are required, which can be satisfied by any one of the following approaches:

o   Courses only (30 credits)

o   Courses (27 credits) + MS Project (3 credits)

o   Courses (24 credits) + MS Thesis (6 credits)

·   Four out of seven core courses are required

If a student chooses to work on an MS project or an MS thesis, the project or thesis must be related to Artificial Intelligence.

Admission Requirements

To be eligible for admission, a student must have a Bachelor of Science degree with a minimum GPA of 3.0 on a 4.0 scale and have completed the following undergraduate coursework:

·   Calculus I and II (equivalent to the NJIT courses Math 111 and Math 112)

o   Derivatives, integrals, applications

o   Business calculus may suffice and will be considered on a case by case basis

·   Introduction to Programming (equivalent to the NJIT CS 113 course)

o   Basic programming constructs, writing and debugging programs, iteration, recursion, arrays, lists

·   Data Structures and Algorithms (equivalent to the NJIT CS 114 course)

o   Basic data structures (lists, arrays, hash tables), search and sort, algorithm analysis

·   Probability and Statistics (equivalent to the NJIT Math 333 course)

o   Random variables, probability distributions, sample mean and variance

o   Basic probability or statistics course separately will also suffice

·   Linear Algebra (equivalent to the NJIT Math 337 course)

o Vector spaces, dot products, Euclidean norm, matrices

International students will have to take TOEFL and GRE exams and meet the minimum requirements for admission to graduate programs at NJIT as per the NJIT policy.

Students who do not meet all of the above requirements but hold a BS or BA a degree in a technical scientific subject will be evaluated on a case-by-case basis and may be admitted to the program after they successfully complete a relevant graduate certificate.

Core Course Requirements

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DS 789	Trustworthy Artificial Intelligence	3
DS 677	Deep Learning	3
CS 670	Artificial Intelligence	3
CS 634	Data Mining	3

Electives

Students will have a wide array of Artificial Intelligence-related electives to choose from. Students would have to take required pre-requisites or seek approval of instructor for the elective courses.