

ARTIFICIAL INTELLIGENCE (M.S. WITH A MAJOR IN AI SOFTWARE AND SYSTEMS)

Artificial Intelligence (AI) is an area of study that explores how to endow machines with the ability to learn, make decisions, reason about data, and communicate with humans. In the Wayne State University's Master of Science in Artificial Intelligence (MSAI) program, students learn to apply problem-solving, creative thinking, algorithmic design, and computer programming skills to build modern AI systems.

Students will gain deep technical training and expertise in a selected concentration area, which include AI Hardware and Systems, AI Algorithms and Systems, and Industrial AI. The program prepares students to (1) work as engineers, consultants and entrepreneurs in industries where AI can provide a competitive edge, or (2) pursue a Ph.D. degree in computer science, electrical engineering, industrial and systems engineering, or other related fields.

Applicants must meet requirements for admission to the Graduate School (<http://bulletins.wayne.edu/graduate/general-information/admission/>). Students must have a bachelor's degree or the equivalent in Engineering from an accredited college or university. Students from all science, technology, engineering, and math (STEM) disciplines will be considered for admission.

The proposed program requires 30 credits for graduation, either Plan A (24 credits of coursework plus 6 credits of master's thesis) or Plan C (30 credits of coursework). All courses must be graduate-level courses offered within the College of Engineering. All course work must be completed in accordance with the regulations of the Graduate School (<http://bulletins.wayne.edu/graduate/general-information/academic-regulations/>) and the College of Engineering (<http://bulletins.wayne.edu/graduate/college-engineering/academic-regulations/>).

A minimum grade point average of 3.00 for the MSAI program is required to obtain the master's degree. A maximum of one course in which a C has been received may be used to meet graduation requirements, provided this is offset by sufficient A grades to maintain the required 3.00 average.

The co-advisor for each major, in working with students to develop their academic plan, will determine which electives are appropriate for their major.

AI Hardware and Systems Major

Hosted by the Electrical and Computer Engineering (ECE) department.

Degree Requirements

- 9 credit hours from AI Hardware and Systems core
- 3 credit hours from AI Algorithms and Systems core
- 3 credit hours from Industrial AI core
- Plan A: 9 credit hours from AI Program electives, including at least 6 credit hours from AI Hardware and Systems electives, or
- Plan C: 15 credit hours from AI Program electives, including at least 12 credit hours from AI Hardware and Systems electives
- Plan A: 6 credit hours of ECE 8999 master's thesis

| Code | Title | Credits |
|---------------------|---|---------|
| Core courses | | |
| ECE 5995 | Special Topics in Electrical and Computer Engineering I * | 3 |

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| ECE 7500 | Artificial Intelligence for Natural Language Processing | 3 |
| ECE 7640 | Online and Adaptive Methods for Machine Learning | 3 |
| Elective courses | | |
| ECE 5560 | Analysis and Design of Analog Integrated Circuits | 3 |
| ECE 5770 | Digital Signal Processing | 4 |
| ECE 5995 | Special Topics in Electrical and Computer Engineering I * | 3 |
| ECE 5690 | Introduction to Digital Image Processing | 4 |
| ECE 7430 | Discrete Event Systems with Machine Learning | 4 |
| ECE 7680 | Advanced Digital Image Processing and Applications | 4 |
| ECE 7995 | Special Topics in Electrical and Computer Engineering II * | 3 |

* Contact an advisor for specific topics that can apply to the AI Hardware and Systems major.

AI Algorithms and Systems Major

Hosted by the Computer Science (CSC) department.

Degree Requirements

- 9 credit hours from AI Algorithms and Systems core
- 3 credit hours from AI Hardware and Systems core
- 3 credit hours from Industrial AI core
- Plan A: 9 credit hours from AI Program electives, including at least 6 credit hours from AI Algorithms and Systems electives, or
- Plan C: 15 credit hours from AI Program electives, including at least 12 credit hours from AI Algorithms and Systems electives
- Plan A: 6 credit hours of CSC 8999 master's thesis

| Code | Title | Credits |
|-------------------------|---|---------|
| Core courses | | |
| CSC 5825 | Introduction to Machine Learning and Applications | 3 |
| CSC 6800 | Artificial Intelligence I | 3 |
| CSC 7760 | Deep Learning | 3 |
| Elective courses | | |
| CSC 5100 | Introduction to Mobility | 3 |
| CSC 5272 | Principles of Cyber Security | 3 |
| CSC 5280 | Introduction to Cyber-Physical Systems | 3 |
| CSC 5430 & CSC 5431 | Game Programming and Design I and Game Programming and Design I: Lab | 4 |
| CSC 5800 | Intelligent Systems: Algorithms and Tools | 3 |
| CSC 5870 | Computer Graphics I | 3 |
| CSC 5991 | Special Topics in Computer Science ** | 3 |
| CSC 6430 & CSC 6431 | Game Programming and Design II and Game Programming and Design II: Lab | 4 |
| CSC 6710 | Database Management Systems I | 3 |
| CSC 6860 | Digital Image Processing and Analysis | 3 |
| CSC 7710 | Database Management Systems II | 3 |
| CSC 7800 | Artificial Intelligence II | 3 |
| CSC 7810 | Data Mining: Algorithms and Applications | 3 |
| CSC 7825 | Machine Learning | 3 |
| CSC 7991 | Advanced Topics in Computer Science (Not repeatable) ** | 3 |

** Contact an advisor for specific topics that can apply to the AI Algorithms and Systems major.

Industrial AI Major

Hosted by the Department of Industrial & Systems Engineering (ISE).

Degree Requirements

- 9 credit hours from Industrial AI core
- 3 credit hours from AI Hardware and Systems core
- 3 credit hours from AI Algorithms and Systems AI core
- Plan A: 9 credit hours from AI Program electives, including at least 6 credit hours from Industrial AI electives, or
- Plan C: 15 credit hours from AI Program electives, including at least 12 credit hours from Industrial AI electives
- Plan A: 6 credit hours of IE 8999 master's thesis

| Code | Title | Credits |
|-------------------------|---|---------|
| Core courses | | |
| IE 6010 | IoT and Edge AI Programming | 3 |
| IE 7860 | Intelligent Analytics | 3 |
| DSA 6100 | Statistical Learning for Data Science and Analytics | 3 |
| Elective courses | | |
| DSA 6000 | Data Science and Analytics | 3 |
| DSA 6200 | Operations Research | 3 |
| IE 5995 | Special Topics in Industrial Engineering *** | 3 |
| IE 6000 | Digital Automation | 3 |
| IE 6040 | Simulation in Robotics Using ROS | 3 |
| IE 7220 | Advanced Statistical Methods | 3 |
| IE 7445 | Manufacturing Analytics | 3 |
| IE 7480 | Knowledge-Based Design | 3 |
| IE 7995 | Graduate Special Topics *** | 3 |

*** Contact an advisor for specific topics that can apply to the Industrial AI major.