

ADVANCED MANUFACTURING MS

Degree Requirements

The following requirements are in addition to, or further elaborate upon, those requirements outlined in The Graduate School Policy Guide (<https://catalogs.northwestern.edu/tgs/academic-policies-procedures/>).

To provide hands-on experience with real-world problem-solving practices, the MS in Advanced Manufacturing requires a thesis to be completed by all students enrolled in the program. No non-thesis options will be available.

Master's

Total Units Required: 12

Six core courses (6 units) and 3 electives (3 units) are required to complete coursework for the MS program. Three additional thesis units are then required to complete the MS thesis requirements, for a total of 12 units required for the degree.

- **Research Thesis** – Students complete 9 courses + 1 academic-focused thesis project. Students may complete this thesis in their 4th quarter, or start early in the 3rd quarter of the program.
- **Practicum Thesis** – Students complete 9 courses + 2-3 small industry-focused thesis projects. Students may complete one project per quarter 1-3 (strongly encouraged for BS/MS who have existing department network), or complete all projects in their 4th quarter.

Course	Title
Required Courses (6 units)	
MECH_ENG 447-0	AI in Manufacturing
MECH_ENG 449-0	Robotic Manipulation
MEM 414-0	Supply Chain Management
MECH_ENG 395-0	Special Topics in Mechanical Engineering (Industry 4.0 Manufacturing)
MECH_ENG 415-0	Mechanics of Manufacturing Processes
MECH_ENG 495-0	Selected Topics in Mechanical Engg (Metal and Ceramic Additive Manufacturing OR Additive Manufacturing of Soft Materials)
Elective Courses (3 units)	
MAT_SCI 381-0	Materials for Energy-Efficient Technology
MAT_SCI 390-2	Materials Design
MAT_SCI 318-0	Materials Selection
MECH_ENG 395-0	Special Topics in Mechanical Engineering (Design and Manufacturing of Medical Devices)
COMP_SCI 346-0	Microcontroller System Design
MECH_ENG 433-0	Advanced Mechatronics
DSGN 407-0	Making Things Sustainable
Thesis (3 units)	
MECH_ENG 499-0	Projects (Practicum Thesis)
MECH_ENG 590-0	Research (Research Thesis)

Other MS Degree Requirements

- **Internship:** Students are strongly encouraged to complete an internship during the summer quarter of the program to gain industry experience.