Applied Engineering M.S.

Applied Engineering Major

The M.S. Applied Engineering program is designed to prepare and develop professionals to perform and function as leaders and skilled technologists in the industrial or educational environments. The program includes four emphases: Engineering Management, Information and Electrical Engineering Technology, Metal Casting, and Applied Systems Engineering Management. The curriculum offers both online and face-to-face classes, which are taught by UNI faculty. The program's core courses offer knowledge and skills in research methods, engineering cost analysis, and advanced project management, while the emphasis courses offer in-depth technical contents in specific technology areas. The program promotes a greater depth of understanding of applied technology and management, and technical and professional competency development. It provides opportunities to develop research and application skills directly related to individual competencies, needs, and objectives.

Students interested in this program must submit a completed Application for Admission to Graduate Study and should refer to their MyUNIverse Student Center To-Do list or contact the Department of Applied Engineering for other application requirements. Graduate information and application for graduate admission can be found at https://admissions.uni.edu/application.

The Graduate Record Examination (General Test) **is not** required for admission to the program.

This degree offers a **thesis and non-thesis option**. The four emphases are the following:

1. Information & Electrical Engineering Technology Emphasis - available in both **thesis** and **non-thesis** options;
2. Metal Casting Emphasis - available in both **thesis** and **non-thesis** options;
3. Engineering Management Emphasis - available in both **thesis** and **non-thesis** options;
4. Applied Systems Engineering Management Emphasis - available in **non-thesis** option only.

This major requires as a prerequisite a bachelor's degree with a major in engineering or technology field. Degree admission to the Master of Science in Technology requires an applicant to have:

1. Earned a minimum of 6 semester hours of college mathematics or statistics related content and 6 semester hours of college physics and/or chemistry and biochemistry or other science related content (this may be either graduate or undergraduate credit);
2. Earned a minimum of 15 semester hours in a major technical field and 8 semester hours in supporting technical subjects;
3. A personal statement;
4. Online Application for Graduate Study;
5. TOEFL score of 550 (paper-based) or 79 iBT;
6. Three professional references; and
7. A minimum cumulative undergraduate grade point average of 2.75.

Only graduate courses (course numbers 5000 or above) will apply to a graduate program, even if the undergraduate course number (4999 or less) is listed. No exceptions will be made.

For both the thesis and non-thesis options, the Master of Science Technology degree program requires a **minimum of 30 semester hours. A minimum of 15 hours of 6000-level course work is required for this degree program.** For the thesis option, students must defend and present their research thesis to their committee members and the public.

MS Applied Engineering required core courses:

TECH 3100/5100	Engineering Cost Analysis	3
TECH 3131/5131	Technical Project Management	3
TECH 6292	Research Methods in Applied Engineering	3
TECH 6400	Introduction to Applied Systems Development & Management	3
Any 5000 or 6000 level math content course approved by adviser.		3
Select one of the emphases below (complete emphasis requirements based on choosing thesis or non-thesis option within emphasis).		15
Total Hours		**30**

Information and Electrical Engineering Technology Emphasis: Available in thesis and non-thesis options

TECH 4000/5000	Wind Energy Engineering	3
TECH 6242	Complex Digital System Design	3
TECH 6244	Applied Embedded Systems	3
Choose thesis or non-thesis option:		**6**
Thesis option:		
TECH 6299	Research (Master's Thesis) (- 6 hours)	
Non-thesis option:		
electives approved by advisor (6 hours)		
Total Hours		**15**

Metal Casting Emphasis: Available in thesis and non-thesis options

Take 3 of the following:		9
ENGR 4235/5235	Material Transformations & Modeling	
TECH 6231	Thermodynamics of Material Processing	
TECH 6239	Foundry Management	
TECH 6258	Total Quality Management	

Choose thesis or non-thesis option:		**6**
Thesis option:		
TECH 6299	Research (Master's Thesis) (6 hours)	
Non-thesis option:		
electives approved by advisor (6 hours)		
Total Hours		**15**

Engineering Management Emphasis: Available in thesis and non-thesis options

Take 3 of the following:		9
TECH 6258	Total Quality Management	
TECH 6275	Advanced Lean and Sustainable Operations	
TECH 6295	Advanced Management and Supervision Technology	
TECH 6300	Advanced Technical Project Management for Engineering and Technology	
Choose thesis or non-thesis option:		**6**
Thesis option:		
TECH 6299	Research (Master's Thesis) (6 hours)	
Non-thesis option:		
electives approved by advisor (6 hours)		
Total Hours		**15**

Applied Systems Engineering Management Emphasis: Available in non-thesis option

TECH 6420	Systems Architecture & Management	3
TECH 6440	Systems Engineering & Management	3
TECH 6460	Systems Life Cycle Management & Applications	3
TECH 6500	Applied Systems Development & Management Capstone	6
Total Hours		**15**

Learning Outcomes

Applied Engineering, M.S.

Program Educational Objectives (PEOs):

- The program will develop leadership professionals such as managers, supervisors, trainers, and administrators.
- The program will enable students to become proficient in performing leadership functions in areas of cost, research and development, and project management operations.
- Thesis option: The program will enhance a student's research and development management proficiencies.
- Non-Thesis option: The program will enhance a student's practical management proficiencies in an area of technology.

Student Learning Outcomes (SLOs):

- Written Communication: Compose a technical document using effective communication techniques.
- Research: Defend a research question by utilizing research analysis techniques.
- Program content knowledge: Evaluate a technological system based on resources.

Related Programs

- Automation Engineering Technology B.S.
- Manufacturing Engineering Technology B.S.
- Materials Science and Engineering B.S.
- Materials Science Engineering Technology B.S.