

M.S. Program Requirements – AsE and EM Degrees

Three MS major areas are available in the Aerospace Engineering Program: 1) Dynamics and Controls, 2) Fluids and Propulsion, or 3) Solids and Structural Mechanics. The course requirements for each appear below.

**MASTERS OF SCIENCE IN AEROSPACE ENGINEERING
ANY MAJOR AREA**

	THESIS	NON-THESIS
Major Option	15 cr. hrs.	18 cr. hrs.
Mathematics	6 cr. hrs.	6 cr. hrs.
Minor Option	--- NA ---	6 cr. hrs.
Technical Electives	9 cr. hrs.	12 cr. hrs.
M.S. Thesis Research	15 cr. hrs.	--- NA ---
Mini Thesis (Research)	--- NA ---	3 cr. hrs.
AsE/EM Seminar	3* cr. hrs.	3* cr. hrs.
<hr/>		
Total	48 cr. hrs.	48 cr. hrs.

The requirements for the Engineering Mechanics MS degree appear below:

**MASTERS OF SCIENCE IN ENGINEERING MECHANICS
ANALYTICAL MECHANICS MAJOR**

	THESIS	NON-THESIS
Dynamics & Control, Fluids, Propulsion and HT, Structures and Solids	15 cr. hrs. with at least 3 in each area	18 cr. hrs. with at least 3 in each area
Mathematics	9 cr. hrs.	9 cr. hrs.
Technical Electives	6 cr. hrs.	15 cr. hrs.
M.S. Thesis Research	15 cr. hrs.	--- NA ---
Mini Thesis (Research)	--- NA ---	3 cr. hrs.
AsE/EM Seminar	3* cr. hrs.	3* cr. hrs.
<hr/>		
Total	48 cr. hrs.	48 cr. hrs.

* - Part-time and GE ACE students are required to take at least 2 credit hours of Seminar, leading to 47 total credits required for the MS degree.

AEROSPACE MS COURSE REQUIREMENTS FOR SPECIFIC MAJORS

i. **Dynamics and Controls**

20-AEEM-603	Analytical Dynamics I (Win)
20-EGFD-615	Introduction to Modern Control (Aut)

Plus 3 (nonthesis) or 4 (thesis) formal, nonresearch 3-CREDIT courses at the 600 level or higher in the Dynamics and Control area. These can include AEEM-604 Analytical Dynamics II, EGFD-622 Optimal Control, AEEM-636 Spacecraft Dynamics, AEEM-693 Advanced Flight Mechanics, AEEM-695 Orbital Mechanics I, EGFD-690 Optimization in Engineering Design, or any other graduate-level Departmental or EGFD courses in the area of Dynamics and Controls. Selected courses from other engineering departments in the Dynamics and Control area are also acceptable.

ii. **Fluids and Propulsion**

20-EGFD-631	Introduction to Combustion Theory (Aut)
20-AEEM-641	Introduction to Compressible Flow (Win)
20-EGFD-741	Viscous Laminar Flow (Aut)
20-AEEM-676	Heat Transfer for Propulsion Systems (Win)
20-AEEM-930	Advanced Propulsion Systems I (Aut)

iii. **Solids and Structural Mechanics**

20-EGFD-701	Engineering Elasticity I (Aut)
-------------	--------------------------------

Plus at least three of the four courses below:

20-AEEM-601	Advanced Strength of Materials (Aut)
20-AEEM-681	Mechanics of Structures (Aut)
20-EGFD-702	Engineering Elasticity II (Win)
20-EGFD-705	Finite Element Techniques I (Win)

Note: 20-EGFD-706 Finite Elements Techniques II can be substituted for Finite Element Techniques I if the student has sufficient background.

COURSE REQUIREMENTS FOR PH.D. IN AEROSPACE
ENGINEERING OR ENGINEERING MECHANICS

Minimum course requirements beyond the BACHELOR'S degree for Ph.D. degree:

Major Option	36 cr. hrs. with at least 18 cr. hrs. in 700 level or above courses
Minor Option	12 cr. hrs.
Mathematics	15 cr. hrs.
Technical Electives	12 cr. hrs.
Research	60 cr. hrs. with at least 45 cr. hrs. in PhD Dissertation Research
Seminar	3 cr. hrs.
<hr/>	
Total	138 cr. hrs.

Note: A previous MS degree can be used to offset up to 45 credits – 30 credits of coursework and 15 credits of Research.