Twin Cities Campus

Aerospace Engineering and Mechanics Minor

Aerospace Engineering & Mechanics

College of Science and Engineering

Link to a list of faculty for this program.

Contact Information:
Director of Graduate Studies, Department of Aerospace Engineering and Mechanics, University of Minnesota, 107 Akerman Hall, 110 Union Street S.E., Minneapolis, MN 55455 (612-625-8000; fax: 612-626-1558)
Email: aem-dgs@umn.edu
Website: https://cse.umn.edu/aem

- Program Type: Graduate minor related to major
- Requirements for this program are current for Fall 2021
- Length of program in credits (Masters): 6
- Length of program in credits (Doctorate): 12
- This program does not require summer semesters for timely completion.

Along with the program-specific requirements listed below, please read the General Information section of the catalog website for requirements that apply to all major fields.

The graduate program emphasizes engineering sciences that are basic to fluid mechanics, aerospace systems, and solid mechanics. Theoretical, analytical, experimental, and computational aspects of these fields are covered by the courses and research opportunities offered by the department.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Prerequisites for Admission

Special Application Requirements:
Students interested in the minor are strongly encouraged to confer with their major field advisor and director of graduate studies, and the Aerospace Engineering and Mechanics director of graduate studies regarding feasibility and requirements.

For an online application or for more information about graduate education admissions, see the General Information section of the catalog website.

Program Requirements

Use of 4xxx courses towards program requirements is not permitted.

Courses must be taken under the AEM course designator to be counted towards a minor.

Courses must be taken on the A-F grade basis, unless only offered S/N.

The minimum cumulative GPA for the minor is 3.00.

Coursework (6 to 12 credits)

Master's students select 6 credits, and doctoral students select 12 credits from the following in consultation with the Aerospace Engineering and Mechanics director of graduate studies. Other courses can be applied to the minor with approval by the Aerospace Engineering and Mechanics director of graduate studies.

AEM 5247 - Hypersonic Aerodynamics (3.0 cr)
AEM 5253 - Computational Fluid Mechanics (3.0 cr)
AEM 5321 - Modern Feedback Control (3.0 cr)
AEM 5333 - Design-to-Flight: Small Uninhabited Aerial Vehicles (3.0 cr)
AEM 5401 - Intermediate Dynamics (3.0 cr)
AEM 5451 - Optimal Estimation (3.0 cr)
AEM 5501 - Continuum Mechanics (3.0 cr)

AEM 5503 - Theory of Elasticity (3.0 cr)
AEM 5581 - Mechanics of Solids (3.0 cr)
AEM 5651 - Aeroelasticity (3.0 cr)
AEM 8201 - Fluid Mechanics I (3.0 cr)
AEM 8202 - Fluid Mechanics II (3.0 cr)
AEM 8203 - Fluid Mechanics III (3.0 cr)
AEM 8207 - Hydrodynamic Stability (3.0 cr)
AEM 8211 - Theory of Turbulence I (3.0 cr)
AEM 8212 - Theory of Turbulence II (3.0 cr)
AEM 8213 - Turbulent Shear Flows (3.0 cr)
AEM 8221 - Rheological Fluid Mechanics (3.0 cr)
AEM 8231 - Molecular Gas Dynamics (3.0 cr)
AEM 8232 - Physical Gas Dynamics and Molecular Simulation (3.0 cr)
AEM 8241 - Perturbation Methods in Fluid Mechanics (3.0 cr)
AEM 8251 - Finite-Volume Methods in Computational Fluid Dynamics (3.0 cr)
AEM 8253 - Computational Methods in Fluid Mechanics (3.0 cr)
AEM 8261 - Nonlinear Waves in Mechanics (3.0 cr)
AEM 8271 - Experimental Methods in Fluid Mechanics (3.0 cr)
AEM 8411 - Advanced Dynamics (3.0 cr)
AEM 8421 - Robust Multivariable Control Design (3.0 cr)
AEM 8423 - Convex Optimization Methods in Control (3.0 cr)
AEM 8426 - Optimization and System Sciences (3.0 cr)
AEM 8442 - Aerospace Positioning, Navigation and Timing (3.0 cr)
AEM 8451 - System Identification: Theory and Applications (3.0 cr)
AEM 8453 - Model Reduction and Approximation of Dynamical Systems (3.0 cr)
AEM 8523 - Elastodynamics (3.0 cr)
AEM 8525 - Elastic Stability of Materials (3.0 cr)
AEM 8527 - Pattern Formation and Bifurcation in Materials (3.0 cr)
AEM 8531 - Fracture Mechanics (3.0 cr)
AEM 8533 - Theory of Plasticity (3.0 cr)
AEM 8541 - Mechanics of Crystalline Solids (3.0 cr)
AEM 8551 - Multiscale Methods for Bridging Length and Time Scales (3.0 cr)

Program Sub-plans

Students are required to complete one of the following sub-plans.
Students may not complete the program with more than one sub-plan.

Masters

Doctoral