Required Courses
Students must take at least one class in EMA at the 700-level or above.
To establish sufficient depth in aerospace sciences, the courses selected must involve completion of at least two of the following five topical areas. You should check the future course offerings plans when choosing, since not all courses are offered every year (and hence not all topical areas can be completed every year).
The additional courses required to meet the 30-credit minimum for completion of the degree should be selected from among the courses listed below.

1. These tracks are internal to the program and represent different pathways a student can follow to earn this degree.
2. Track names do not appear in the Graduate School admissions application, and they will not appear on the transcript.
3. If you have already completed an equivalent course as an undergrad then you may take two courses total from the second list and meet this requirement.

TOPICAL AREAS
Fluid Mechanics
E M A 521 Aerodynamics 2 3 cr
Select one: 3 cr
- E M A 524 Rocket Propulsion
- M E 572 Intermediate Gas Dynamics
- M E 775 Turbulent Heat and Momentum Transfer

Rigid Body Dynamics
E M A 542 Advanced Dynamics 2 3 cr
Select one: 3 cr
- E M A 523 Flight Dynamics and Control
- E M A/ASTRON 550 Astrodynamics
- E M A 642 Satellite Dynamics
- M E 451 Kinematics and Dynamics of Machine Systems

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Structural Dynamics
Select one: 3 cr
- ME 440 Intermediate Vibrations
- EMA 545 Mechanical Vibrations
- ECE 717 Linear Systems
Select one: 3 cr
- ME/EMA 540 Experimental Vibration and Dynamic System Analysis
- EMA 610 Structural Finite Element Model Validation
- EMA 747 Nonlinear and Random Mechanical Vibrations

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Aerospace Mechanics and Materials
Select two courses: 6 cr
- EMA 506 Advanced Mechanics of Materials I
- EMA/MSE 541 Heterogeneous and Multiphase Materials
- ENGR/ME 508 Composite Materials
- EMA 622 Mechanics of Continua
- EMA 630 Viscoelastic Solids
- EMA 700 Theory of Elasticity
- EMA/M E 703 Plasticity Theory and Physics

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Computation
Select one: 3 cr
- EMA 605 Introduction to Finite Elements
- ME 573 Computational Fluid Dynamics
Select one: 3 cr
- EMA 705 Advanced Topics in Finite Elements
- ME 548 Introduction to Design Optimization
- ME 748 Optimum Design of Mechanical Elements and Systems
- MATH/COMP SCI 714 Methods of Computational Mathematics I
- ME A/COMP SCI/ECE/EPE/ME 759 High Performance Computing for Applications in Engineering

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