

Minor in Aerospace Engineering

Offered by: Sibley School of Mechanical and Aerospace Engineering

Administered by: MAE undergraduate coordinator, 108 Upson Hall, 255-3573, np18@cornell.edu

Eligibility: All undergraduates. ***Pre-Approval for the Aerospace Minor is required.*** Students intending to earn a minor in Aerospace Engineering should seek advice and pre-approval of their minor academic program from the associate director for undergraduate affairs in MAE before taking courses toward the minor.

Educational Objectives:

The aerospace minor develops the engineering analysis and design skills necessary for creating and understanding aerospace vehicles and their subsystems. The minor includes diverse topics relevant to applications both in the earth's atmosphere (e.g. aerodynamics) and in space (e.g. spacecraft thermal systems or orbital mechanics). Students in this minor will take at least four core aerospace courses, along with up to two supporting courses in engineering fundamentals or courses with applicability to aeronautics and spacecraft.

Requirements:

1) Six courses from the lists below, each worth at least 3 credits, must be completed. No substitutions will be accepted from other departments at Cornell or elsewhere. Any course used to satisfy early M. Eng graduation may **not** be used for Aerospace minor,

2) Rules for ME majors:

- a) Select at least 4 courses from group A, of which you must choose MAE 3050 or MAE 4060 (or both).
- b) Select at most 2 courses from group B. No courses from group C may be used.
- c) Two courses must be selected from the Aerospace Engineering subject field under the Major Approved Electives list in Mechanical Engineering (for a complete listing, consult). These two courses may not be used toward fulfilling the B.S., Mechanical Engineering degree requirements

3) Rules for other majors:

- a) Select at least 4 courses from group A, of which you must choose MAE 3050 or MAE 4060 (or both).
- b) Select a total of at most 2 courses from group B and group C.
- c) You may not use any courses to satisfy requirements of both the Mechanical Engineering Minor and the Aerospace Engineering Minor.

Academic Standards: A grade of C- or better in each course. In S/U only courses, S is acceptable.

GROUP A: Core Aerospace Engineering

MAE 3050: Intro to Aeronautics

MAE 4060: Introduction to Spaceflight Mechanics

MAE 4160/4161/5160: Spacecraft Technology and Systems Architecture

MAE/ECE 4150: GPS: Theory and Design

MAE 4291^a: Supervised Senior Design Experience, **with Aerospace Focus**

or MAE 4900^b: Individual and Group Projects in Mechanical Engineering, **with Aerospace Focus**

MAE 4230/4231/5230: Intermediate Fluid Dynamics

MAE 4510/5510: Propulsion and Power

MAE 5070: Dynamics of Flight Vehicles

NOTE

an. MAE 4291 and 4900 require a form, signed by the project advisor, stating that the project focuses on Aerospace and is suitable as a core aerospace course for the minor. MAE 4291 or 4900 must be worth 3 credits or more. Students may count at most one MAE 4291 OR one MAE 4900 toward the minor (i.e. students may not count both MAE 4291 and MAE 4900 toward the minor).

GROUP B: Courses Applicable to Aerospace Engineering

MAE 4020/4021/5020: Wind Power

MAE 4130/4131/5130: Mechanics of Composite Structures

MAE 4140/4141: Mechanics of Lightweight Vehicles

MAE 4180/5180: Autonomous Mobile Robots

MAE 4700/4701/5700: Finite Element Analysis for Mechanical and Aerospace Design **or** CEE 4720: Introduction to the Finite Element Method

MAE 4730/5730: Intermediate Dynamics and Vibrations

MAE 4780/5780 Control Systems

MAE 5430: Combustion Processes

MAE 6510: Advanced Heat Transfer

GROUP C: Fundamentals

ENGRD 2020: Statics and Mechanics of Solids

MAE 2030: Dynamics

ENGRD 2210: Thermodynamics

MAE 2120: Mechanical Properties and Selection of Engineering Materials

MAE 3230: Introductory Fluid Mechanics

MAE 3240: Heat Transfer

MAE 3250: Analysis of Mechanical and Aerospace Structures

MAE 3260: System Dynamics

MAE 3780/3783: Mechatronics **or** ECE/ENGRD 2100: Intro. to Circuits for Electrical and Computer Engineers **or** PHYS 3360: Electronic Circuits