

SPACE SYSTEMS ENGINEERING, MASTER OF SCIENCE

Admission Requirements

Applicants must meet the general requirements for admission to graduate study, as outlined in the Admission Requirements (<https://e-catalogue.jhu.edu/engineering/engineering-professionals/admission-requirements/>) section.

The applicant's prior education must include an undergraduate or graduate degree in a quantitative discipline (e.g., engineering, computer science, mathematics, physics, or equivalent) from a regionally accredited college or university. Applicants must show competency in (1) calculus, (2) physics, and (3) computer programming, which must be demonstrated through undergraduate or graduate coursework or equivalent work experience.

Applicants whose prior education does not include the coursework listed above may still enroll under provisional status, followed by full admission status once they have completed the missing courses. Admitted students typically have earned a grade point average of at least 3.0 on a 4.0 scale (B or above) in the latter half of their undergraduate studies. When reviewing an application, the candidate's academic and professional background will be considered. As part of the admission process, the chair or the program coordinator may interview candidates to better evaluate their application.

Program Requirements

A total of ten courses (at least three at the 700-level) must be completed within five years. The curriculum consists of five core courses and five electives. A maximum of two courses from other programs may be used to satisfy the program elective requirement. Elective selections outside of those listed below are subject to advisor approval. The curriculum is designed to provide maximum flexibility to students, enabling them to customize their five electives based on their educational needs and career goals. Only one C-range grade (C+, C, or C-) can count toward the master's degree. All core courses in the Space Systems Engineering program may be completed remotely, except for the program capstone EN.675.710 Small Satellite Development and Experimentation, which includes a requirement that students attend a specified residency weekend in the Baltimore area to complete the laboratory component.

Electives are offered online in either asynchronous or synchronous (virtual live) format. Some electives offer an in-person option at the Johns Hopkins Applied Physics Lab (Laurel, MD) or Bloomberg Center (Washington, D.C.). Several electives may be offered as in-person only; consult the website each semester for specifics.

Core Courses

Code	Title	Credits
Courses		Credits
EN.675.600	Systems Engineering for Space	3
EN.675.601	Fundamentals of Engineering Space Systems I	3
EN.675.602	Fundamentals of Engineering Space Systems II	3
EN.675.701	Applications of Space Systems Engineering	3
EN.675.710	Small Satellite Development and Experimentation	3

ELECTIVES

Code	Title	Credits
Courses		Credits
EN.675.613	The Bold Science Motivating and Enabled by our Engineering	3
EN.675.617	The Intersection of Space Systems Engineering and International Public Policy	3
EN.675.621	Space Environment and Effects	3
EN.675.622	Spacecraft Hardware Design Considerations	3
EN.675.641	Space Systems Cybersecurity	3
EN.675.650	Mathematics for Space Systems	3
EN.675.691	Electro-Optical Space Systems	3
EN.675.702	Materials for Space Systems	3
EN.675.711	Ground System Engineering and Mission Operations	3
EN.675.712	Space Mission Formulation	3
EN.675.713	Fault Management and Autonomy: Improving Spacecraft Survivability	3
EN.675.722	Space Mechanical Systems Design and Analysis	3
EN.675.724	Principles of Space Internetworking	3
EN.675.731	Spacecraft Propulsion Systems	3
EN.675.732	Advanced Topics in Aerospace Hardware	3
EN.675.733	Spacecraft Rendezvous and Proximity Operations	3
EN.675.734	Fundamentals of Celestial and Orbital Mechanics	3
EN.675.740	Assuring Success of Aerospace Programs	3
EN.675.751	Space Weather and Space Systems	3
EN.675.752	Attitude Determination and Control of Space Systems	3
EN.675.753	Spacecraft Avionics Systems	3
EN.675.754	Flight Software for Space Systems	3
EN.675.756	Antenna Design for Space Systems	3
EN.675.761	Reliability Engineering and Analysis for Space Missions	3
EN.675.768	Spacecraft Integration and Test	3
EN.675.771	Space Mission Design and Navigation	3
EN.675.772	Verification and Validation of Space Systems	3
EN.675.781	Physics of Space Security	3
EN.675.792	Scientific Instruments for Space	3
EN.675.800	Directed Studies in Space Systems Engineering	3
EN.525.640	Satellite Communications Systems	3
EN.525.744	Passive Emitter Geo-Location	3

Please refer to the course schedule (<https://ep.jhu.edu/courses/>) published each term for exact dates, times, locations, fees, and instructors.