

# SATELLITE SYSTEM DESIGN - GRADUATE CERTIFICATE

The certificate recognizes student accomplishments at the graduate level in successfully completing a specialized program of study in Satellite System Design (SSD). It blends courses from the Smead Department of Aerospace Engineering Sciences, Electrical, Computer and Energy Engineering and Engineering Management Departments. The certificate allows students to develop interdisciplinary skills in the area of satellite design and be more desirable to potential employers.

This certificate is available to degree-seeking and non-matriculated students. Additional certificate information can be found on the department's Satellite System Design Certificate (<https://www.colorado.edu/aerospace/current-students/graduates/curriculum/certificate-programs/satellite-system-design-certificate/>) webpage.

## Distance Education Option

Students can take individual courses toward a master's degree or graduate certificate through distance education (online). For more information, connect with the individual graduate program directly.

## Requirements

### Admissions Requirements

- Completed undergraduate degree from an institution accredited by an agency recognized by the U.S. Department of Education or its equivalent.
- Undergraduate courses in calculus, linear algebra and differential equations; two semesters of undergraduate calculus-based physics; and at least two semesters of upper-division undergraduate courses in engineering or physics.
- Ability to program at a level that will enable successful completion of graduate course assignments.

For more information, degree-seeking students may visit the AES Certificates (<https://www.colorado.edu/aerospace/academics/graduates/curriculum/certificates/>) webpage; nondegree-seeking and non-matriculated students may visit the AES Certificates & Continuing Education (<https://www.colorado.edu/aerospace/admissions/graduates/degree-programs/certificates-continuing-education/>) webpage.

### Certificate Requirements

Grades of B or higher are required for fulfillment of requirements and certificate award. Students also pursuing other graduate certificates may *not* use the same courses to count for both certificates.

### Program Tracks

The certificate in satellite system design (SSD) offers two track options.

#### Track 1: Hands-on (recommended for on-campus students.)

Code	Title	Credit Hours
<b>Required Courses</b>		<b>12</b>
ASEN 5018	Graduate Projects I (Project must have a satellite or rocket focus)	3
ASEN 5148	Spacecraft Design	3

ASEN 6028	Graduate Projects II (Project must have a satellite or rocket focus)	3
One course from the Elective list below		3

#### Track 2: Distance Compatible

Code	Title	Credit Hours
<b>Required Courses</b>		<b>12</b>
ASEN 5148	Spacecraft Design	3
EMEN 5405	Fundamentals of Systems Engineering	3
Two elective courses from list below (no more than one EMEN course)		6

#### Elective List

Students are required to meet course prerequisites. Questions should be directed to the course instructor.

To develop cross-disciplinary breadth, students are strongly encouraged, but not required, to choose elective courses outside of their major.

Code	Title	Credit Hours
<b>Electives</b>		
ASEN 5010	Spacecraft Attitude Dynamics and Control <sup>1</sup>	3
ASEN 5050	Space Flight Dynamics <sup>1</sup>	3
or ASEN 5052	Analytical Astrodynamics	
ASEN 5067	Microavionics: Introduction to PIC Microcontrollers for Aerospace Systems <sup>2</sup>	3
ASEN 5090	Introduction to Global Navigation Satellite Systems <sup>1</sup>	3
ASEN 5335	Aerospace Environment	3
ECEN 5134	Electromagnetic Radiation and Antennas	3
ECEN 5264	Electromagnetic Absorption, Scattering, and Propagation	3
ECEN 5517	Power Electronics and Photovoltaic Power Systems Laboratory	3
ECEN 5613	Embedded System Design	3
ECEN 5623	Real-Time Embedded Systems	3
ECEN 5634	Microwave and RF Laboratory	3
ECEN 5692	Principles of Digital Communication	3
ECEN 5797	Introduction to Power Electronics	3
ECEN 5813	Principles of Embedded Software	3
EMEN 5010	Introduction to Engineering Management	3
EMEN 5030	Fundamentals of Project Management	3
EMEN 5031	Software Project Management	3
EMEN 5405	Fundamentals of Systems Engineering	3

<sup>1</sup> Core ASN certificate courses. Cannot be counted for both certificates.

<sup>2</sup> Course enrollment limited to non-Electrical Engineering students.