

**APPROVED CURRICULUM FOR B.S. DEGREE IN AEROSPACE ENGINEERING SCIENCES (128 total credit hrs)  
AY 2020-2021**

FRESHMAN YEAR	Credit Hours	Pre-requisites (PR) and Co-requisites (CR)- <b>Grade of C or better required</b>
<b>Fall Semester</b>	<b>15</b>	
APPM 1350* Calculus 1 for Engineers	4	(PR) 2 years high school algebra, 1 year geometry, ½ year trigonometry
GEEN 1400 Engr Projects/ASEN 1403 Rocket Engr	3	(PR) Freshman standing in College of Engineering
ASEN 1320** Aerospace Computing ( <i>also offered spring</i> )	4	(CR/PR) Calculus 1
Lower-division Humanities/Social Science Elective	3	(PR) Varies
Free Elective (ex: COEN 1350)	1	
<b>Spring Semester</b>	<b>17</b>	
APPM 1360* Calculus 2 for Engineers	4	(PR) APPM 1350
ASEN 1022 Materials Science for Aerospace Engineers	3	(CR/PR) APPM 1350 OR APPM 1345; (CR/PR) ASEN 1320**
PHYS 1110 General Physics 1	4	(CR/PR) APPM 1350
Lower-division Humanities/Social Science Electives	6	(PR) Varies

**In order to start the ASEN core (2000 level courses and beyond), students need a "C" or better in the following pre-requisite courses: APPM 1350, APPM 1360 (or MATH equivalents), PHYS 1110, AND one of the following programming courses: ASEN 1320 or CSCI 1300 (or transferable equivalents).**

<b>SOPHOMORE YEAR</b>	<b>Fall Semester</b>	<b>16</b>	
	APPM 2350* Calculus 3 for Engineers	4	(PR) APPM 1360
	ASEN 2001 Intro to Statics, Structures, Materials	4	(PR) APPM 1350, 1360, PHYS 1110, ASEN 1320**; (CR/PR) APPM 2350; (CR) ASEN 2012
	ASEN 2002 Intro Thermodynamics, Aerodynamics	4	(PR) APPM 1350, 1360, PHYS 1110, ASEN 1320**; (CR/PR) APPM 2350; (CR) ASEN 2012
	ASEN 2012 Experimental & Computational Methods in AES	2	(PR) APPM 1350, 1360, PHYS 1110, ASEN 1320**; (CR/PR) APPM 2350
	Free Electives (ex: COEN 2350 and APPM 2450)	2	(PR) Varies
	<b>Spring Semester</b>	<b>18</b>	
	APPM 2360* Intro Diff Equations w/Linear Alg	4	(PR) APPM 1360
	ASEN 2003 Intro Dynamics & Systems	5	(PR) APPM 2350; ASEN 2001, 2012; (CR/PR) APPM 2360
	ASEN 2004 Vehicle Design & Performance	5	(PR) APPM 2350, ASEN 2002, 2012; (CR/PR) APPM 2360
	PHYS 1120^ General Physics 2	4	(PR) PHYS 1110; (CR/PR) APPM 1360
	^( <i>or take PHYS 1120 fall semester of Junior year or any time after completing PHYS 1110</i> )		

<b>JUNIOR YEAR</b>	<b>Fall Semester</b>	<b>15</b>	
	Upper-division Humanities/Social Science Elective	3	(PR) Varies
	ASEN 3XXX	4	
	ASEN 3XXX	4	
	ASEN 3XXX	4	
	<b>Spring Semester</b>	<b>16</b>	
	ASEN 3XXX	4	
	ASEN 3XXX	4	
	ASEN 3XXX	4	
	Professional Area Elective	3	(PR) Varies
	Free Elective	1	(PR) Varies

Choose 3 ASEN 3000-level courses each semester from selection on right.

<sup>o</sup>NOTE: PHYS 1120 is a prerequisite for ASEN 3300

For ASEN 3000-level courses, choose from:

- **ASEN 3111** Aerodynamics
  - (PR) APPM 2350, 2360; ASEN 2002, 2004
- **ASEN 3112** Structures
  - (PR) APPM 2350, 2360; ASEN 2001, 2003
- **ASEN 3113** Thermo & Heat Transfer
  - (PR) APPM 2350, 2360; ASEN 2002
- **ASEN 3128** Aircraft Dynamics
  - (PR) APPM 2350, 2360; ASEN 2002, 2003, 2004
- **ASEN 3200** Orbit Mech/Attitude Dynamics & Control
  - (PR) APPM 2350, 2360; ASEN 2003, 2004
- **ASEN 3300<sup>o</sup>** Electronics & Communications
  - (PR) APPM 2350, 2360; ASEN 2003, PHYS 1120

SENIOR YEAR		Credit Hours	Pre-requisites (PR) and Co-requisites (CR)- <b>Grade of C or better required</b>
	<b>Fall Semester</b>	<b>16</b>	
	ASEN 4013 Fdn of Propulsion ( <i>also offered spring</i> )	3	(PR) APPM 2360, ASEN 3113
	ASEN 4018 Senior Projects 1: Design Synthesis ( <i>Note 1</i> )	4	(PR) <b>All</b> 3000-level ASEN courses and ASEN 1022
	Professional Area Electives	6	(PR) Varies
	Upper-division Writing***	3	(PR) Varies
	<b>Spring Semester</b>	<b>16</b>	
	ASEN 4028 Senior Projects 2: Design Practicum	4	(PR) ASEN 4018
	Professional Area Electives	6	(PR) Varies
	Upper-division Humanities/Social Science Elective	3	(PR) Varies
	Free Electives	3	(PR) Varies

**Many ASEN courses are offered in specific terms only and therefore must be taken in this specific sequence. ASEN 1320, 3000 level core ASEN courses, and ASEN 4013 are exceptions to this rule and are offered both in Fall and Spring semesters.**

#### NOTES:

\* **APPM OR MATH courses accepted**

APPM1350=MATH 1300

APPM 1360=MATH 2300

APPM 2350=MATH 2400

APPM 2360=MATH 3430 AND MATH 2130

\*\* **Programming is a prerequisite for all 2000 level ASEN courses. Recommended course: ASEN 1320 Aerospace Computing.** Alternative options: CSCI 1300, ECEN 1310. **All AES students must be proficient in MATLAB prior to sophomore level courses.**

**MATLAB Student Version:** <https://oit.colorado.edu/software-hardware/software-downloads-and-licensing/matlab>.

\*\*\* **Options for Upper-division Writing Requirement:** ENES 1010 (only available to Freshmen students), ENES 3100, PHYS 3050, WRTG 3030, WRTG 3035

**(Note 1):** Senior Projects 1 & 2 must be completed in the same Academic Year. Senior Standing in Aerospace Engineering = satisfactory completion of all junior-level Aerospace course requirements.

**Professional Area Electives (PAEs):** Professional Area Electives are select 3000, 4000 and 5000-level math, science, and engineering courses (with the exception of CSCI, ECEN, and PHYS where select 2000-level courses are also accepted). Total number of PAE credits = 15. **Use the Degree Audit** to get a full list of approved PAEs.

**Free Electives: Total = 7 credit hrs.** Free Electives are courses outside of major/minor coursework.

**Humanities & Social Sciences (H&SS) Requirements include:** 9 credit hours of lower-division H & SS, 6 credit hours of upper-division H&SS & 3 credit hours of upper division writing (students can only take HUEN 1010 in their freshmen year for it to be used toward the upper division writing requirement). Total H&SS=18 credit hours. Please visit: <https://www.colorado.edu/engineering-advising/get-your-degree/degree-requirements/humanities-social-sciences-and-writing-requirements> for more information.