

CURRICULUM FOR B.S. DEGREE IN AEROSPACE ENGINEERING SCIENCES

****Applies to students who enter the program in Academic Years 2021 and 2022****

		<u>Credit Hours</u>	<u>Prerequisites (PR) and Corequisites (CR):</u> Grade of C or better required
FIRST YEAR <div style="border: 1px solid black; padding: 5px; width: fit-content;"> ASEN 1320, PHYS 1110, & Engineering projects can be taken in either Fall or Spring semester. </div>	Fall Semester	15	
	APPM 1350* Calculus 1 for Engineers	4	
	ASEN 1320** Aerospace Computing & Engr Apps	4	(PR or CR) APPM 1235 or APPM 1350
	Humanities/Social Science Electives	6	
	Free Elective	1	
	Spring Semester	17	
	APPM 1360* Calculus 2 for Engineers	4	(PR) APPM 1350
	ASEN 1022 Materials Science	3	(PR or CR) APPM 1350 OR APPM 1345; ASEN 1320**
	PHYS 1110 General Physics 1	4	(PR or CR) APPM 1350
	GEEN 1400 or ASEN 1403 Engineering Projects	3	
	Humanities/Social Science Electives	3	

The **ASEN core** (2000 level courses and beyond) requires students to have earned a "C" or better in the following prerequisite 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).

		<u>Credit Hours</u>	<u>Prerequisites (PR) and Corequisites (CR):</u> Grade of C or better required
Starting in Fall 2022			
SOPHOMORE YEAR	Fall Semester	16	
	APPM 2360* Intro Diff Equations w/Linear Algebra	4	(PR) APPM 1360
	ASEN 2701 Intro to Statics, Structures, Materials	3	(PR) APPM 1360, PHYS 1110; (PR or CR) APPM 2360
	ASEN 2702 Intro Thermodynamics, Aerodynamics	3	(PR) APPM 1360, PHYS 1110; (PR or CR) APPM 2360
	ASEN 2802 Aerospace Sciences Lab 1	1	(PR) ASEN 1320**;
	ASEN 2012 Experimental & Computational Methods	2	(PR or CR) ASEN 2701, 2702, 2012
	Free Elective	3	(PR) PHYS 1110, ASEN 1320**;
	Spring Semester	17	(PR or CR) APPM 2360
	APPM 2350* Calculus 3 for Engineers	4	(PR) APPM 1360
	ASEN 2703 Intro to Dynamics & Systems	3	(PR) APPM 2360, ASEN 2701; (PR or CR) APPM 2350
	ASEN 2803 Dynamics & Controls Lab	1	(PR) ASEN 1320**;
	ASEN 2704 Aero Vehicle Design & Performance	3	(PR or CR) ASEN 2703, 2012
	ASEN 2804 Aero Vehicle Design Lab	2	(PR) APPM 2360, ASEN 2702; (PR or CR) APPM 2350
	PHYS 1120^ General Physics 2	4	(PR) ASEN 1320**;
	^(or take PHYS 1120 fall semester of Junior year)		(PR or CR); ASEN 2704, 2012
			(PR) PHYS 1110; (PR or CR) APPM 1360

Starting in Fall 2023		Credit Hours	Prerequisites (PR) and Corequisites (CR): Grade of C or better required
JUNIOR YEAR <div> FSM and DCA blocks are offered both semesters. Therefore, students can also take DCA in the fall and FSM in the spring. </div>	Fall Semester	16	
	<u>Fluids, Structures, and Materials Block (FSM)</u>		
	ASEN 3711 Aerodynamics	3	(PR) APPM 2350; ASEN 2704
	ASEN 3712 Structures	3	(PR) APPM 2350; ASEN 2703
	ASEN 3713 Thermo and Heat Transfer	3	(PR) APPM 2350, 2360; ASEN 2702
	ASEN 3802 Aerospace Sciences Lab 2	1	(PR) ASEN 2802, 2012; (PR or CR) ASEN 3711, 3712, 3713
	Upper Division Humanities/Social Science Elective	3	
	Free Elective	3	
	Spring Semester	15	
	<u>Dynamics, Controls, and Avionics Block (DCA)</u>		
	ASEN 3728 Aircraft Dynamics	3	(PR) APPM 2350; ASEN 2703, 2704
	ASEN 3700 Orbital Mech/Attitude Dynamics	3	(PR) APPM 2350; ASEN 2703, 2704
	ASEN 3801 Aero Vehicles Dyn & Controls Lab	1	(PR) ASEN 2803, 2804; (PR or CR) ASEN 3700, 3728
	ASEN 3300 Electronics & Communications	4	(PR) APPM 2350; ASEN 2703, PHYS 1120
	Technical Elective	3	
	Free Elective	1	

		Credit Hours	Prerequisites (PR) and Corequisites (CR): Grade of C or better required
SENIOR YEAR	Fall Semester	16	
	ASEN 4018 Senior Projects 1 (<i>Note 1</i>)	4	(PR) All 3000-level ASEN courses and ASEN 1022
	Technical Electives	6	
	Upper Division Engineering Writing***	3	
	Free Elective	3	
	Spring Semester	16	
	ASEN 4028 Senior Projects 2	4	(PR) ASEN 4018
	ASEN 4013 Propulsion (<i>also offered in fall</i>)	3	(PR) ASEN 3111, 3113
	Technical Electives	6	
	Upper Division Humanities/Social Science Elective	3	

Key:

* **APPM OR MATH courses accepted**

APPM1350 = MATH 1300

APPM 1360 = MATH 2300

APPM 2350 = MATH 2400

APPM 2360 = MATH 3430 & MATH 2130

** **Programming is a prerequisite for all ASEN courses =>2000-level. Recommend ASEN 1320 Aerospace Computing. All AES students must be proficient in MATLAB.**

MATLAB Student Version: <https://oit.colorado.edu/software-hardware/software-downloads-and-licensing/matlab>. Programming options are:
ASEN 1320, CSCI 1300, OR ECEN 1310.

*** **Options for Upper Division Writing Requirement:** ENES 1010 (only available to first year students), ENES 3100, ENLP 3100, PHYS 3050, WRTG 3030, WRTG 3035.

(Note 1): Senior Projects 1 & 2 must be completed in the same Academic Year, starting in the fall.

Technical Electives: Total = 15 credit hours. Technical 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). **Use the Degree Audit** to get a full list of approved Tech electives.

Free Electives: Total = 11 credit hours. Free Electives are courses outside specified degree requirements. A free elective can be any course you're interested in that you also meet the prerequisites for.

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. **Total H&SS= 18 credit hours.**