ASTE 520 *Spacecraft System Design*

Required for *Astronautical Engineering*

Regardless of your engineering or science major (electrical, mechanical, aerospace, systems, computer, etc. or physics, astronomy, chemistry, math, etc.) and regardless of your **job function** (research, development, design, test, manufacturing, management, marketing, etc.)

If you work or plan/desire to work in the space/defense industry or government space R&D centers or in space operations, then ... this is a course (on space systems) that you must take.

ASTE520 focuses on the fundamentals of space systems. It will help you put into perspective your area of specialization and enable professional communications with other subsystem specialists.

This popular course is among the largest graduate space systems and space technology courses in the United States, with 2300 students enrolled since 1994.

Academic year 2023–2024

ASTE520 *Spacecraft Systems Design* is offered **only in the fall (2023)** semester (not offered in Spring 2024).

Fall 2023 Thursday, 6:40 – 9:20 pm (Pacific Time)

Class enrollment is unlimited

For students enrolled in the class:
Course materials for *ASTE 520* will be posted on the DEN class website in mid-August.

Help with access the D2L site http://courses.uscden.net at DEN: http://gapp.usc.edu/graduate-programs/den/students

ASTE-520 public web site (http://astronauticsnow.com/aste520/) provides information on the syllabus, textbooks, and much more.

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For students with ASTE Bachelor of Science degree from USC (BS ASTE)

Since you studied some ASTE-520 topics in ASTE-280 and ASTE-330/331ab, you can waive the ASTE-520 requirement toward MS ASTE.

Please check first the ASTE-520 course content in Section 00, Part 1 and Part 2 (no password required) of the course notes – you can also view them at

http://astronauticsnow.com/aste520/aste520_info_web_recent.pdf

Then, decide. The decision is entirely up to you.

If you decide to waive the ASTE-520 requirement, then you **must** contact ASTE Student Services Director Mr. Luis Saballos and inform him – the waiver must be added to your file.

For students with non-USC Bachelor of Science degrees

If you took a course similar to (or significantly overlapping with) ASTE-520 during your studies, then you can waive this course requirement towards MS ASTE.

Please consult

http://astronauticsnow.com/msaste/faq.html#Waiver_of_the_required_course

how to proceed.

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Spacecraft Design – ASTE 520

Thursday, 6:40–9:20 p.m., OHE-100D Fall 2023

Class	Date	Subject	NS	W&E&P New SMAD (L&W SMAD); [FSM] Chapters	HW Due
1	Aug 24	Organization of the class. History of rocketry and space (self study). Universe, galaxy, solar system.	0 1 2	1 [1,2]	
2	Aug 31	Space environment.	3	7 (8) [3]	1,2
3	Sep 07	Orbital mechanics.	4	9 (5,6,7) [4-8]	3,4,5
4	Sep 14	Orbital mechanics. Space mission geometry.	4 5	8,9 (5,6,7) [5-8] 8,9 (5,6,7) [9]	6, 7, 8
5	Sep 21	Space mission geometry. Attitude determination and control (ADC).	5 7	8 (5) [9 19 (10,11) [3]	9,10,11
6	Sep 28	Attitude determination and control (ADC).	7	19 (10,11) [3]	12,13,14,15
7	Oct 05	Spacecraft Propulsion.	8	18 (17,18)	16,17,18
Fall recess	Fall recess	Spacecraft and mission design overview. Facilities. Operations. Reliability watch lecture NS-6; no HW; 2-day recess	6	1,3,4,6,14,24,28,29 (1,3,4,10,14,15,19)	
8	Oct 19	MID-TERM	7:00–9:00 p.m. (Pacific)		
9	Oct 26	Launch systems. Communications	9 10	26,27 (17,18) 16,21 (10,11,13)	19,20
10	Nov 02	Communications	10	16,21 (10,11,13,16)	21,22
11	Nov 09	Electric Power systems.	11	21 (10,11)	23,24,25
12	Nov 16	Thermal control.	12	22 (10,11)	26,27
13	Nov 30	Structures and mechanisms	13	22 (10,11)	28,29,30
	Dec 07	FINAL EXAM	7:00–8:30 p.m. (Pacific)		

W&E&P New SMAD = Wertz, Everett, Puschell, The New SMAD L&W SMAD = Larson and Wertz, SMAD
FSM = Gruntman, Fundamentals of Space Missions
NS = Notes Section; HW = homework