

AERO 4365 – Aerospace Systems Engineering

Course Syllabus

Spring 2024

Meeting Time:	MW 9:00 – 10:20 a.m.
Meeting Location:	Classroom Building C201
Final Exam Time:	TBD
Course Designation:	AERO 4365
CRN	26839
Credit Hours:	3
Lecture Hours:	3
Course Description:	A holistic view of aerospace systems covering systems engineering; design drivers, trade studies, and design decisions; cost and weight estimation; vehicle performance; safety and reliability; lifecycle topics; vehicle attributes and subsystems; risk analysis; project management, and system realization.
Course Objective:	<p>The objective of this course is to provide the student with an introduction to systems engineering with an emphasis on the following topics: the systems engineering process, requirements, design fundamentals, subsystem fundamentals, trade studies, integration, technical reviews, case studies, and ethics.</p> <p>Additional learning objectives include: 1) to develop a systems engineering perspective of how space missions are conceived, developed, and implemented; 2) to establish and mature the knowledge and comprehension of the value and purpose of systems engineering; 3) to establish a working knowledge of the methods and tools systems engineers use; and 4) to understand the roles of systems engineers and develop the ability to contribute to the development of complex space missions.</p>
Prerequisite(s):	None.
Co-requisite(s):	None.
Course Website:	MSTeams Course webpage

Knowledge, Skills, And Abilities Students Should Have Before Entering This Course: Communicate technical information accurately and concisely – both orally and in writing, use analysis, computer software, word processors, etc., to define and develop solutions to technical problems in aerospace engineering.

Knowledge, skills, and abilities students gain from this course: This course will give students an initial exposure to the field of systems engineering as it applies to space missions. Students will learn key topics related to spacecraft and mission design, including requirements development, trade studies, the project life cycle, system hierarchy, risk analysis, and cost analysis. The concepts presented in this course will be demonstrated with examples from current NASA missions. The students will also be exposed to concepts regarding team organization, design fundamentals, and work ethics. These topics will be in preparation for the capstone design course experience. They will learn that systems engineering is iterative and will develop judgment that will allow them to compare and evaluate engineering alternatives. They will learn to discuss systems engineering methods and processes as well as engage in systems thinking.

INSTRUCTOR INFORMATION

Joel Quintana, Ph.D.

Office: Engineering Building, Room A110
Office Hours: MW 10:30 - 11:30 am
Email: jquintana@utep.edu

TEXTBOOK

A single textbook is not available for this class. Lecture materials will be provided and distributed on the course MSTeams website. Additional reading assignments and reference materials will also be provided throughout the course. Students may be asked to purchase a book, per a select list, for a systems engineering relevancy book review. Selections will be made at the beginning of the course. References: Public domain government documents:

- NASA Systems Engineering Handbook; SP-610S; June 1995
- Systems Engineering Fundamentals; Defense Acquisition University Press; January 2001
- Select readings and reports

SOFTWARE

Computers are used for writing reports (WORD) and presentations (PowerPoint). Spreadsheets are used as appropriate in doing multiple trade studies. Computational tools such as (STK, MatLab, etc.) are used as appropriate in doing analyses and trade studies.

CLASS FORMAT

This course follows a lecture format and meets two times a week. Assignments will be both individual and group. Groups will be approximately 2-3 people, and pre-assigned by the instructor. Students are responsible for reading the assigned material prior to the scheduled class. Class participation is required and part of the course grading. Students are encouraged to participate actively and to ask questions freely. Students will be expected to present their work periodically.

GRADE DISTRIBUTION

Homework	40%
In-class participation	10%
Book Report Project	15%
Mid-term Exam	15%
Final Exam	20%
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Total	100%

CLASS ATTENDANCE POLICY

Lecture attendance is in person unless otherwise noted. Attendance will be considered as the *In-Class Participation* portion of the grade distribution.

EXCUSED ABSENCE FOR EXAMS

The UTEP catalog allows Exam Absence to be excused ONLY for University-Recognized Activities and specific situations.

ACADEMIC HONESTY

During exams, you are not allowed to use any wifi-enabled electronic device, including cell phones or other electronic communication devices or methods (wristwatches, earbuds, etc.). No wristwatch or other electronic device may be worn. Calculators and watches may be subject to inspection. You may be asked to remove glasses to allow for their inspection temporarily. You may not bring backpacks, hats, bulky coats, or hoodies into the exam room. Lockers are not available at the exam site so plan and leave your belongings in a secure location. You may NOT sit them in the corner of the exam room. You must show your work for all problems. You must use the paper provided by the instructor. If no work is shown, you may not receive credit. After the exam, the instructor may require you to explain how you solved a problem on the exam. You may be subject to disciplinary action if you refuse to or cannot explain your work. No electronic version of the book, loose paper printouts, or extra sheets of paper is allowed unless explicitly mentioned in writing by the instructor. As a part of the zero-tolerance policy, if you have a cellphone or other electronic device capable of communication on your person, if any proctor sees or hears any electronic device during the exam, or if you share your work with someone else, you will be reported to the proper authorities. You may receive a zero on the exam or an F in the class. Other actions including suspension may also be pursued. No one will be allowed to leave the room during an exam. This includes restroom breaks. University-approved recording devices may be located in the room and may be out of sight of the students. These recordings will be managed according to the UTEP-approved regulations for such media. The instructor may create a record of your activity during the exam and may take photographs of your work during the exam. If you are suspected of scholastic dishonesty, you may or may not be directly confronted about your conduct by the instructor or proctor. You will, however, be reported to the Office of Student Conduct and Conflict Resolution (OSCCR) and your exam may not be admissible. Your grade in the class may be available once OSCCR makes a final ruling; this may adversely impact your ability to enroll in other classes. You must arrive before 15 minutes late to an exam to be allowed to take the examination. There will be no makeup exams administered. If you have a university-approved excuse, your instructor will have a process for determining how to handle the missing grade outlined in the syllabus. However, no makeup exams will be given. If you miss more than one exam, the instructor may choose to drop you from the class administratively. This may adversely impact a visa and financial aid. No food or drink may be brought into the examination room. The departmental policy allows for the use of assigned seats. All students must present their UTEP issued ID prior to and during every exam and may be required to sign in. Not having a UTEP issued ID when asked will result in forfeiture of the exam. No other IDs will be accepted. Scholastic dishonesty on homework, lab assignments and all other class assignments will be held to the same standards and requirements of academic honesty as quizzes and exams.

HARASSMENT POLICY

The University (see Handbook of Operating Procedures 1.2.2.4) has a zero-tolerance policy for harassment. Engagement in any behavior considered harassment will be reported to the proper authorities. In addition to generally understood forms of harassment, the department also treats the following behavior as harassment:

- Repeated emails and/or calls regarding subjects that have already been addressed. Once a decision has been made or a question answered, the recipient of the email/call will give a warning to a student who continues to ask the same question. If the student continues, the behavior will be reported. Questions that seek understanding of course material are not harassment, but repeated questions about a grade or an administrative decision are.
- Grades are NOT negotiable, ever. If you believe a grading mistake has been made, you must follow the process described in the UTEP catalog. Any request for a grade elevation NOT based on a mistake is considered harassment and will be reported immediately.
- Remaining in an office after the occupant requests you leave is considered harassment and potentially threatening. You will be reported immediately without warning and depending on the severity, may be reported to law enforcement.
- Similar behavior towards department staff and student advisors will also be treated as harassment, including persistent phone calls, emails, and badgering. Department staff and student advisors are there to help students and should be treated with due respect.

AMERICAN DISABILITIES ACT

If you feel you may have a disability that requires accommodations, contact the Center for Accommodations and Support Services (CASS) at 747-5148 or go to Union East, Room 106.