



MENG 4350–Introduction to Aerospace Vehicles Design

Course Syllabus

Semester / Year	Fall 2025
Catalog Description	<p>This course will introduce students to the principles of aircraft and spacecraft design. Topics related to aircraft include aviation and airframe loads, wing design, propulsion, aircraft performance, and stability and control. For spacecraft, the course will cover the design process, spacecraft subsystems, rocket and launch vehicle performance, spacecraft thermal interactions, and orbital mechanics. Additionally, the course will include a hands-on project that will involve using software for modeling purposes</p> <p>Three hours of lecture per week.</p>
Prerequisites	ENGR 2302, MENG 3319, and grade C or better in MENG/CENG 3306
Section Number	030, 50
Instructor Name	Dr. Ermias G. Koricho
Contact Information	Email: ekoricho@uttyler.edu Phone: 903-730-3895 Office: A220
Class Type / Instruction Mode / Location	HEC: Lecture/Face-to-Face/ HEC 0A216 Tyler: Hybrid – Zoom Lectures and In-Classroom-Exams/RBN 03038. Zoom ID: It will be posted on the Syllabus page in Canvas
Class Time	Tue and Thu 05:0 PM to 06:20 PM
Office Hours	Tue and Thu 03:30 PM to 04:30 PM W 04:45 PM to 05:45 PM and by appointment
No. of Credits	3 credits
Required Textbook	No textbook is required as lectures will reference material from a range of Aircraft and Spacecraft textbooks and provide a full complement of lecture notes with practice questions.
Optional References	<p>Aircraft</p> <ol style="list-style-type: none">1. Aircraft Structures for engineering students, Fourth Edition, T. H. G. Megson, 2007.2. Anderson, Introduction to Flight, 8th Ed. 2016 <p>Spacecraft</p> <ol style="list-style-type: none">1. Spacecraft Structures, J. Wijker, 2008. (Textbook)2. Sellers, Understanding Space: An Introduction to Astronautics, 3rd Ed. 2005
Additional Rules and Requirements	<p>Students may discuss their homework solutions with one another, but each student must submit their own, independent solution (i.e. you may not just copy someone else's homework.</p> <p>Students can use AI programs (ChatGPT, Copilot, etc.) in this course. If you utilize an AI tool to help create content for an assignment, you must acknowledge and cite the tool's contribution to your work.</p>



Evaluation Method	<p><u>Grading System:</u></p> <table><tr><td>¹Assignments and Quizzes</td><td>20%</td></tr><tr><td>Midterm Exam</td><td>30%</td></tr><tr><td>Final Exam</td><td>30%</td></tr><tr><td>²Project</td><td>20%</td></tr></table> <p>¹There will be homework assignments that are directly related to classroom discussion and test material. Everybody is required to attend all the classes. There will be both announced and unannounced quizzes. These quizzes cannot be made up in any circumstances.</p> <p>²The project is a group project on aircraft/spacecraft subsystem design. Detailed information about the project will be delivered during the class.</p>	¹ Assignments and Quizzes	20%	Midterm Exam	30%	Final Exam	30%	² Project	20%
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Grading Policy / Scale	<p>Letter grades, scale: A: 90 – 100; B: 80 – 89; C: 70 – 79; D: 60 – 69; F: < 60</p>								
Important Events / Dates	<p>Census date: September 08 First drop for non-payment: September 02 Last date to withdraw from one or more 15-week courses: November 03 Exam date(week): Midterm Exam: October 14, 2025. Final Exam: December 08-12 as per the university calendar.</p> <p>https://www.uttyler.edu/academics/academic-calendar-25-26/</p>								
Attendance / Makeup policy / other rules	<p>Regular attendance is required. In case you have to miss a class, it is your responsibility to keep up with the class work and be informed of all announcements made in the class.</p> <p>Homework Assignments: homework will be assigned according with the topics covered in lectures. Assignments are considered very important for the understanding of the course material. Completing your homework independently is an absolute necessity to do well in this course.</p> <p>Besides, it is expected that all work products (e.g. homework, projects, presentations, reports, etc.) submitted for class to be of professional quality. Failure to submit professional quality work may result in grade reductions, regardless of whether any grading scheme or rubric for an assignment explicitly includes professionalism in the grade calculation.</p> <p>Makeup exam: An opportunity to make up a missed exam may be available to students with an excused absence. Excused absences include absences for university-sponsored events and for religious observances (University policies). Other makeups are granted only in extreme cases and at the discretion of the instructor. Excused absence due to illness will require evidence of treatment by medical personnel at a medical facility. Makeup exams may be scheduled for the end of the semester.</p> <p>Canvas: All course materials, including the syllabus, handouts, example problems with solutions, homework assignments, quiz solutions, and review materials, will be posted on Canvas. Please make sure to review the materials posted on Canvas regularly.</p>								



Course Learning Objectives / ABET & PEOs Relation	<p>By the end of this course, students will be able to:</p> <ol style="list-style-type: none">1. Demonstrate knowledge of fundamentals of aircraft and spacecraft design requirements and related theories.2. Identify and describe the key components of aircrafts and spacecrafts.3. Design and evaluate basic structural components of aircrafts and spacecrafts.4. Conduct a case study as an application integrating the course components with skills gained in different parts of the curriculum.5. Communicate technical results and findings to different audiences.
Tentative Topics / Course Plans	<p>Topical Outline:</p> <p>Aircraft</p> <ol style="list-style-type: none">1. Introduction<ol style="list-style-type: none">a. Materialsb. Structural components of Aircraft components2. Aviation and Airframe loads3. Performance of airfoils and wings4. Elements of Airplane Performance5. Airplane stability and controls6. Airplane propulsion and power <p>Spacecraft</p> <ol style="list-style-type: none">1. Introduction to spacecraft systems engineering2. Introduction to astrodynamics3. Spacecraft subsystems4. Rocket performance and launch Vehicles5. Spacecraft thermal interactions
University Policies	<p>https://www.uttyler.edu/offices/academic-affairs/files/syllabus-information.pdf</p>