

AAE 251: Introduction to Aerospace Design
Course Syllabus - Fall 2012 - 3 credit hours

Instructor	Dr. Michael Grant, Assistant Professor Email: mjgrant@purdue.edu Office: ARMS 3212, Phone: 765-494-4054 Office Hours: MW 2:30-3:30pm or by appointment
Teaching Assistants (TAs)	Peter Edelman (pedelman@purdue.edu) Office Hours (in ARMS 3141): M 3:30-5:30pm, W 3:30-5:30pm, Th 12:30-2:30pm Aaron Rosen (rosen0@purdue.edu) Office Hours (in ARMS 3237): T 12:00-2:00pm, W 10:00-12:00pm, F 10:00-12:00pm
Lectures	Section 1: MWF 4:30 PM - 5:20 PM, GRIS 180 Section 2: MWF 1:30 PM - 2:20 PM, RPH 164 Attendance is encouraged. Lectures may cover topics not in the book. You may not change attended sections without official approval.
Course Website	Blackboard Learn Course Management System http://www.itap.purdue.edu/tlt/blackboard/ Electronic material (e.g., assignments) will be made available on the Blackboard website throughout the semester. Note, Blackboard Vista will NOT be used.
Textbook	Required: Anderson, J. D., <i>Introduction to Flight</i> , 7 th Edition, McGraw-Hill, 2012.
Additional References	Brandt, S. A., Stiles, R. J., Bertin, J. J., and Whitford, R., <i>Introduction to Aeronautics: A Design Perspective</i> , 2 nd Edition, AIAA, 2004.
Grades	Exams: 35% (3 exams will be given); No final exam Homework: 40% Vehicle of the Week Presentation: 5% Design Project: 20%
Learning Objectives	Recognize and distinguish form and function of aerospace vehicles. Formulate and apply basic equations of motion for aerospace vehicles. Analyze basic aerodynamics, propulsion, and performance of atmospheric vehicles. Analyze basic propulsion and performance of rockets and spacecraft. Implement analyses in computer programs to produce correct engineering results. Comprehend and apply multidisciplinary aerospace design. Craft and deliver effective engineering presentations. Work in teams to design and synthesize a feasible aerospace system, and describe its development and capabilities via technical writing.
Topics and Dates	The following is a draft set of lecture topics. Content adjustments are expected during the semester based on schedule progress and the availability of guest speakers. Expected homework issuance and due dates are noted.

Date	Topic	Homework
08/20	Class introduction, history, design terminology	
08/22	Anatomy of aircraft and spacecraft	
08/24	Source of aerodynamic forces	
08/27	Standard atmosphere	
08/29	Aerodynamics	
08/31	Aerodynamics	HW 1 Assigned
09/03	No class - Labor Day	
09/05	Aerodynamics	
09/07	Aerodynamics	HW 1 Due, HW 2 Assigned
09/10	Aerodynamics	
09/12	Aerodynamics	
09/14	Aerodynamics	HW 2 Due, HW 3 Assigned
09/17	Tour of Purdue airport facilities	
09/19	Distribution of design project	
09/21	Dr. Jarret Lafleur @ 1:30pm in PHYS 112 and @ 4:30pm in GRIS 180	HW 3 Due, HW 4 Assigned
09/24	Equations of motion	
09/26	Aircraft performance	
09/28	Aircraft performance	HW 4 Due
10/01	Aircraft performance	
10/03	Exam 1	
10/05	Aircraft performance	HW 5 Assigned
10/08	No class - October Break	
10/10	Aircraft stability	
10/12	Aircraft stability	HW 5 Due, HW 6 Assigned
10/15	Aircraft propulsion	
10/17	Aircraft propulsion	
10/19	Vehicle of the Week Presentations	HW 6 Due, HW 7 Assigned
10/22	Rocket equation	
10/24	Rocket propulsion	
10/26	Vehicle of the Week Presentations	HW 7 Due
10/29	Rocket staging	
10/31	Exam 2	
11/02	Orbits	HW 8 Assigned
11/05	Orbits	
11/07	Orbits	
11/09	Vehicle of the Week Presentations	HW 8 Due, HW 9 Assigned
11/12	Orbits	
11/14	Orbits	
11/16	Vehicle of the Week Presentations	HW 9 Due, HW 10 Assigned
11/19	Launch sites and ground tracks	
11/21	No class - Thanksgiving	
11/23	No class - Thanksgiving	
11/26	Vehicle of the Week Presentations	HW 10 Due
11/28	Exam 3	
11/30	Entry	
12/03	Entry	
12/05	Entry	
12/07	Entry	
12/08	Group Project Due / Presentations	

Vehicle of Week Presentation Please see “Vehicle of the Week” folder on course webpage for explanation.

Exam Policy	There are three examinations: Exam 1 on Wed., Oct. 3 , Exam 2 on Wed., Oct. 31 (tentative), and Exam 3 on Wed, Nov. 28 (tentative). Exams are closed book/notes unless otherwise specified. There is no final exam.
Design Project	The course includes a team design project. The project gives students the opportunity to work in a collaborative environment and apply knowledge gained to the conceptual design of an aerospace system. Teams of six students will perform analysis and design to fulfill a request for proposal (RFP) and deliver a technical presentation of the design along with a written design proposal report. Final presentations for the project will be given by the teams on Sat., Dec. 8 (the Saturday before Finals Week).
Submissions	Please see the “Submission Standards” document on the course website. Simply following the standards will improve your grade. No late submissions will be accepted.
Useful Websites and Simulation Tools	http://www.grc.nasa.gov/WWW/K-12/airplane/foil3.html http://www.grc.nasa.gov/WWW/K-12/airplane/ngnsim.html http://www.desktopaero.com/adw/welcome.html
Conduct	1) Attendance is encouraged. Lectures may cover topics not in the textbook. 2) Active participation in the class is strongly encouraged. 3) Students must adhere to the Purdue Academic Honor Code http://www.purdue.edu/univregs/studentconduct/index.html
Emergency Notice	In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances beyond the instructor’s control. Here are ways to get information about changes in this course (all listed above): a) course website, b) instructor email, instructor phone.