

SPST616

STUDENT WARNING: This course syllabus is from a previous semester archive and serves only as a preparatory reference. Please use this syllabus as a reference only until the professor opens the classroom and you have access to the updated course syllabus. Please do NOT purchase any books or start any work based on this syllabus; this syllabus may NOT be the one that your individual instructor uses for a course that has not yet started. If you need to verify course textbooks, please refer to the online course description through your student portal. This syllabus is proprietary material of APUS.

Course Summary

Course : SPST616 **Title :** Aircraft Design

Length of Course : 8

Prerequisites : SPST615 **Credit Hours :** 3

Description

Course Description: This course is an introduction to aircraft design. The Design Process, Airfoil and Geometry Selection, Thrust-To-Weight Ratio and Wing Loading, Sizing, Crew Station, Payload, and Passengers, Propulsion and Fuel System, Landing Gear and Subsystems, Aerodynamics, Basic Propulsion, Structures and Loads, Stability, Control, and Handling Qualities, Performance and Flight Mechanics, as well as Cost Analysis, are some of the areas covered in the course. PREREQ: SPST615 AERODYNAMICS. IT IS HIGHLY RECOMMENDED THAT YOU HAVE PREVIOUSLY COMPLETED COLLEGE ALGEBRA AND CALCULUS I BEFORE TAKING THIS COURSE.

Course Scope:

This course fulfills a portion of the concentration requirements for the Master of Science in Space Studies – Capstone Option. At the end of this course the student will have a fundamental understanding of aircraft performance and associated theories as they relate to aircraft design.

Objectives

Upon completion of this course, the student will be able to:

- CO-1: Describe the concepts and applications of aircraft design
 - CO-2: Apply critical thinking skill to the analysis of aircraft design theory
 - CO-3: Apply design theory and performance equations to real-world scenarios
 - CO-4: Evaluate design issues associated with subsonic, transonic and supersonic flight
 - CO-5: Judge aerodynamic and cost effectiveness of various aircraft designs and combinations
 - CO-6: Demonstrate graduate-level critical thinking and writing
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Outline

Week 1: Introduction, Evolution and Philosophy of Aircraft Design

Learning Objective(s)

1-6

Readings

Anderson,

Chapters 1 and 7

Assignment(s)

Forum Topics 1 & 2
(Due end of Week 1)

Week 2: Aerodynamic and Propulsive Characteristics of the Airplane

Learning Objective(s)

1-6

Readings

Anderson,

Chapters 2 and 3

Assignment(s)

Homework Assignment #1 (Due end of Week 2)

Forum Topic #3

(Due end of Week 2)

Week 3: Aircraft Performance (Part I) Equations of Motion and Steady Flight

Learning Objective(s)

1-6

Readings

Anderson,

Chapters 4 and 5

Assignment(s)

Forum Topic #4

(Due end of Week 3)

Week 4: Aircraft Performance (Part II) Accelerated Flight

Learning Objective(s)

1-6

Readings

Anderson,

Chapter 6

Assignment(s)

Homework Assignment #2 (Due end of Week 4)

Forum #5

(Due end of Week 4)

Week 5: Propeller Aircraft Design

Learning Objective(s)

1-6

Readings

Anderson,

Chapter 8

Assignment(s)

Forum #6

(Due end of Week 5)

Week 6: Jet Aircraft Design

Learning Objective(s)

1-6

Readings

Anderson,

Chapter 9

Assignment(s)

Homework Assignment #3 (Due end of Week 6)

Forum #7

(Due end of Week 6)

Week 7: Aircraft Cockpits, Interiors, and Ergonomics

Learning Objective(s)

1-6

Readings

As Assigned in Week 7 Lesson

Assignment(s)

Forum #8

(Due end of Week 7)

Week 8: Final Examination and Research Paper

Learning Objective(s)

1-6

Readings

Review Previously Read Material

Assignment(s)

Final Exam (Covers all material presented in class; Due end of Week 8)

Research Paper Due end of Week 8

Evaluation

Grades for this course will be based on the following grading instruments. You must complete all assigned tasks in order to pass the course.

Research Paper

Details on the research paper are posted in the assignments area. The 10 page paper will be due at the end of Week 8 and is worth 20-percent of your total course grade. Your paper must be at least 10 pages of written material; you can use illustrations, graphs, charts, etc. but the written portion of your paper must be at least 10 pages. Turabian style must be used and be sure to cite ALL facts/sources as you use them!

Forum Postings

Eight times throughout the course, discussion items will be posted within the Forum area of the classroom. Your responses must be at least 250 words, be in YOUR OWN WORDS (no quotes), well written and grammatically correct. Your responses will clearly show whether you have read assigned classroom readings (listed in this syllabus). Opinions are always welcome... However, postings providing only opinions will be graded accordingly! You must also comment on one other student's posting.

Homework Assignments

The homework assignments make up 30% of your overall course grade. Details for each homework assignment can be found in the assignments section. Work must be shown in order to obtain full credit for each question.

Final Exam

The final exam is worth a total of 18 percent of your course grade and will test your knowledge of the terms and concepts covered over the entire 8 week class. Although open book, it is literally impossible to pass the exam without having completed the assigned readings and homework assignments.

All assignments in this course are given to you prior to the due date. The “due date” for all assignments is the week in which the assignment is due. For the purposes of this course, a “**week**” is defined as the time period between Monday–Sunday. The **first week** begins on the first day of the semester and ends at 11:59 PM EST the following **Sunday**.

Grading:

Name	Grade %
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Materials

Book Title: Aircraft Performance and Design

Author: Anderson, John D.

Publication Info: W.C.Brown Pub.Co.

ISBN: 9780070019713

Course Guidelines

Citation and Reference Style

- Attention Please: Students will follow the APA Format as the sole citation and reference style used in written work submitted as part of coursework to the University. Assignments completed in a narrative essay or composition format must follow the citation style cited in the APA Format.

Tutoring

- [Tutor.com](https://www.tutor.com) offers online homework help and learning resources by connecting students to certified tutors for one-on-one help. AMU and APU students are eligible for 10 free hours* of tutoring provided by APUS. Tutors are available 24/7 unless otherwise noted. Tutor.com also has a SkillCenter Resource Library offering educational resources, worksheets, videos, websites and career help. Accessing these resources does not count against tutoring hours and is also available 24/7. Please visit the APUS Library and search for 'Tutor' to create an account.

Late Assignments

- Students are expected to submit classroom assignments by the posted due date and to complete the course according to the published class schedule. The due date for each assignment is listed under each Assignment.
- Generally speaking, late work may result in a deduction up to 15% of the grade for each day late, not to exceed 5 days.
- As a working adult I know your time is limited and often out of your control. Faculty may be more flexible if they know ahead of time of any potential late assignments.

Turn It In

- Faculty may require assignments be submitted to Turnitin.com. Turnitin.com will analyze a paper and report instances of potential plagiarism for the student to edit before submitting it for a grade. In some cases professors may require students to use Turnitin.com. This is automatically processed through the Assignments area of the course.

Academic Dishonesty

- Academic Dishonesty incorporates more than plagiarism, which is using the work of others without citation. Academic dishonesty includes any use of content purchased or retrieved from web services such as CourseHero.com. Additionally, allowing your work to be placed on such web services is academic dishonesty, as it is enabling the dishonesty of others. The copy and pasting of content from any web page, without citation as a direct quote, is academic dishonesty. When in doubt, do not copy/paste, and always cite.

Submission Guidelines

- Some assignments may have very specific requirements for formatting (such as font, margins, etc) and submission file type (such as .docx, .pdf, etc) See the assignment instructions for details. In general, standard file types such as those associated with Microsoft Office are preferred, unless otherwise specified.

Disclaimer Statement

- Course content may vary from the outline to meet the needs of this particular group.

Communicating on the Forum

- Forums are the heart of the interaction in this course. The more engaged and lively the exchanges, the more interesting and fun the course will be. Only substantive comments will receive credit. Although there is a final posting time after which the instructor will grade comments, it is not sufficient to wait until the last day to contribute your comments/questions on the forum. The purpose of the forums is to actively participate in an on-going discussion about the assigned content.
- “Substantive” means comments that contribute something new and hopefully important to the discussion. Thus a message that simply says “I agree” is not substantive. A substantive comment contributes a new idea or perspective, a good follow-up question to a point made, offers a response to a question, provides an example or illustration of a key point, points out an inconsistency in an argument, etc.
- As a class, if we run into conflicting view points, we must respect each individual's own opinion. Hateful and hurtful comments towards other individuals, students, groups, peoples, and/or societies will not be tolerated.

Identity Verification & Live Proctoring

- Faculty may require students to provide proof of identity when submitting assignments or completing assessments in this course. Verification may be in the form of a photograph and/or video of the student's face together with a valid photo ID, depending on the assignment format.
- Faculty may require live proctoring when completing assessments in this course. Proctoring may include identity verification and continuous monitoring of the student by webcam and microphone during testing.

University Policies

[Student Handbook](#)

- [Drop/Withdrawal policy](#)
- [Extension Requests](#)
- [Academic Probation](#)
- [Appeals](#)
- [Disability Accommodations](#)

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