

SPST611

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 : SPST611 **Title :** Aircraft Propulsion Systems

Length of Course : 8

Prerequisites : N/A **Credit Hours :** 3

Description

Course Description: This course is an introduction to aircraft propulsion systems, including their design and development, turbo propulsion combustion technology, engine/airframe performance matching, inlets and inlet/engine integration, exhaust nozzle aerodynamics, engine operability, and aeroelasticity and unsteady 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 propulsion and associated theories as they relate to aircraft.

Objectives

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

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

Outline

Week 1: Overview and Introductory Propulsion Concepts

Course Objective(s)

1-6

Readings

Hill & Peterson,

Chapters 1 and 2 (Sections 2.1-2.3)

Aerodynamics for Naval Aviators, pgs 95 - 149

Assignment(s)

Forum Topics: 1 & 2

(Due end of Week 1)

Week 2: Steady – One Dimensional Flow and Equations

Course Objective(s)

1-6

Readings

Hill & Peterson,

Chapter 3

Assignment(s)

Quiz #1

(Due end of Week 2)

Week 3: Thermodynamics of Jet Aircraft Engines

Course Objective(s)

1-6

Readings

Hill & Peterson,

Chapter 5 (Sections 5.1 – 5.6)

Assignment(s)

Forum Topic #3

(Due end of Week 3)

Short Paper Assignment (Due end of Week 3)

Week 4: Turbine Engine Performance and Composition

Course Objective(s)

1-6

Readings

Hill & Peterson,

Chapter 5 (Sections. 5.7 – 5.8) and Chapter 6 (Sections 6.1 – 6.3)

Assignment(s)

Quiz #2

(Due end of Week 4)

Week 5: Axial and Centrifugal Compressors

Course Objective(s)

1-6

Readings

Hill & Peterson,

Chapter 7 (Sections 7.1 – 7.6, 7.7, 7.10 – 7.11) and Chapter 9 (Sections 9.1 – 9.2)

Assignment(s)

Forum Topic #4

(Due end of Week 5)

Week 6: Combustors and Nozzles

Course Objective(s)

1-6

Readings

Hill & Peterson,

Chapter 6 (Section 6.4 - 6.7)

Assignment(s)

Quiz #3

(Due end of Week 6)

Week 7: Axial Turbines

Course Objective(s)

1-6

Readings

Hill & Peterson,

Chapter 8

Assignment(s)

Forum Topic #5

(Due end of Week 7)

Quiz #4

(Due end of Week 8)

Week 8: Research Paper

Course Objective(s)

1-6

Readings

Review all course material

Assignment(s)

Final Exam

(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.

Forum Postings

Five times throughout the course, discussion items will be posted within the Forum area of the classroom. Your responses must be between 100-300 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 two other student postings.

Short Paper

Details can be found in the assignments area. The 5 page paper will be due at the end of Week 3 and is worth 8-percent of your total course grade. Your paper must be at least five pages of written material; you can use illustrations, graphs, charts, etc. but the written portion of your paper must be at least 2 pages. Chicago style must be used and be sure to cite ALL facts/sources as you use them!

Quizzes

The four (open book) quizzes are worth a total of 32 percent of your course grade and will test your

knowledge of the terms and concepts covered in the textbooks. Each exam consists of multiple choice and essay questions. You will have a week to complete each exam. Although open book, it is literally impossible to pass the exams without having completed the assigned readings.

Final Exam

The final exam is worth a total of 20 percent of your course grade and will test your knowledge of the terms and concepts covered during the entire course. The exam consists of multiple choice and essay questions. You will have six hours to complete the exam. Although open book, it is literally impossible to pass the final exam without having completed the assigned readings.

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. Chicago style must be used and be sure to cite ALL facts/sources as you use them!

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: Mechanics and Thermodynamics of Propulsion (custom)- (The custom ISBN may have more competitive pricing in hard copy or electronic format. The non-custom ISBN is: 9780201146592, please use this one to search for the book from other booksellers.)

Author: Hill, Philip G.

Publication Info: Pearson

ISBN: 9781269648691

Book Title: Aerodynamics for Naval Aviators

Author: Hurt, H. H. Jr.

Publication Info: Wing Aero Products, Inc.

ISBN: 9781619540170

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](#)

The mission of American Public University System is to provide high quality higher education with emphasis on educating the nation's military and public service communities by offering respected, relevant, accessible, affordable, and student-focused online programs that prepare students for service and leadership in a diverse, global society.

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