

SPST445

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

Description

Course Description: This course evaluates Space Transportation Systems (STS) including manned space flight operations, supporting systems and the Space Shuttle mission, both present and future. Included are manned space flight operations, supporting systems and the Space Shuttle mission, both present and future. A review of Space Shuttle flight profiles, guidance and navigation control, proximity operations and rendezvous and a brief review of hypersonic orbiter aerodynamics are included. Also covered are future STS applications to space station logistical operations, commercial applications and Department of Defense operations. (Prerequisite: SPST300).

Course Scope:

This course focuses our studies on the most complex space system ever created and operated – the Space Transportation Systems (STS) also known as the Space Shuttle. The course will cover Shuttle space flight operations, supporting systems and review flight profiles, guidance and navigation control, proximity operations and rendezvous with a brief introduction of hypersonic orbiter aerodynamics. Also covered are Shuttle applications to space station logistical operations, commercial applications and Department of Defense operations. Finally, similar hypersonic systems (i.e. X-15) will be addressed with a look to the future of manned space flight.

Objectives

After successfully completing this course, you will be able to

- Describe the aerospace history that led to the construction of the U.S. Space Shuttle.
- Describe the major shuttle systems including the orbiter, the main engines, the external tank, and the solid rocket boosters.
- Explain the operations involved in a normal space shuttle mission as well as planned abort sequence actions.
- Identify the operations of the space shuttle infrastructure to include the orbiter processing facility, the vehicle assembly building, launch control, the launch pads and mission control as well as mission planning procedures
- Analyze the facts of the two shuttle accidents and what possible actions may have prevented these

mishaps.

- Determine future space transportation objectives of commercial space transportation ventures.
-

Outline

Week 1: Intro to 445, STS

Readings

NASA - (Space Shuttle Link)

Space Shuttle, Missions, Era,

Launch and Landing

SP407 Space Shuttle (New Era, Space Shuttle System and Mission Profile)

Critical Issues - Intro

Assignment

Week 1 Forum – Introductions

Discuss Group Project

Week 2: X-15

Readings

X-15 Chapters 1 - 3

Assignment

Week 2 Forum

Start Group Project Forum

Research Paper Topics due

Week 3: STS

Readings

X-15 Chapter 4

SP-407 Space Shuttle (Space Shuttle Vehicle, Economic Impact)

Assignment

Week 3 Forum

Continue working Group project

MR/A participation graded

Week 4: To The Future

Readings

Critical Issues – Section 1: Motivations

X-15 Chapter 8

Assignment

Week 4 Forum

Continue working Group project

Research Paper due

Week 5: Shuttle Accidents

Readings

Critical Issues – Section 5: NASA Cultures

Columbia Accident Investigation Report

Rogers Commission

Assignment

Week 5 Forum

Continue working Group Project

Week 6: Commercial Space

Readings

Critical Issues – Section 4: Access to Space

NASA Commercial Crew Peer Review

Assignment

Week 6 Forum

Group Project – Section Drafts due

Week 7: Project Presentations

Readings

Peer Review

Assignment

Week 7 Forum

Week 8: Future of Spaceflight

Readings

Spaceship one, Shuttle follow on, Space tourism(Web Search)

Assignment

Week 8 Discussion Forum

Group Project – Section Finals due

Evaluation

Discussion Board/Class Participation (Forums)

Participation with other students in the weekly Forum Discussion Board area of the classroom makes up 35% of your final grade. Your knowledge of readings will be reflected in your ability to actively participate and discuss key course concepts. Your initial response, posted by Thursday, must be at least 250 words, well written, supported, and grammatically correct to be considered for full credit. Responses to at least 3 other classmate's Initial posts, completed by Sunday, should be at least 100 words. Returning to your own thread to answer questions asked of you is expected. Your Initial post makes up 50% of your Forum grade. Responses and discussion decide the other 50% - participation is key!

Research Paper:

The Space Shuttle program generated a plethora of ground-breaking space technologies (i.e. re-usability, heat shield, orbiting laboratories) and space operations (i.e. mechanical arms, space construction, re-entry profiles, large crews). You must choose ONE revolutionary aspect from the Shuttle program for your research paper.

Your paper should be approximately 8 pages long (not including Cover and Bibliography pages) and include at least five text pages on the selected technology. Use of pictures and diagrams, properly annotated and cited, is expected (pictures/diagrams do not count toward text pages). See the Assignment for more detailed instructions / expectations.

Topics are to be approved by the end of Week 2. As repeat selections of topics are limited, choose early! The Research paper, worth 20% of your final grade, will be due at the end of Week 4.

Group Project:

As a class, we will discuss the possible follow-on programs for the space shuttle. The overall purpose behind this assignment is to research the future of manned space flight while applying the synergistic knowledge of the entire class.

Aspects to discuss include: mission/goals, program design (performance, schedule, cost), crew size/life support, launch type, assembly requirements, reusability, returnability, growth/adaptability, ground support requirements, etc. Sections will have individual ownership with peer review to ensure a homogenous product.

A *project handout* will be presented in Week 1 describing the conduct of the Group Project, the participation expectations, general and specific guidelines, and grading emphasis. A PowerPoint template will be provided for individual project section development.

Project Deliverables:

- *Mission Requirements and Assumptions (MR/A)* – conducted as a group forum. Active participation in mission requirements, project assumptions, and section selection forums is key to success. Graded at the end of Week 3. Worth 10% of your final grade, this activity is graded as a separate Forum.
- *Section Draft* – Section Leads, with input from Assists (and others) in section specific threads of the

Group Project Forum, will be responsible for creating the PowerPoint section draft due at the end of Week 6. In addition to slide bullets and dialog (Notes section), pictures and diagrams are expected. Worth 20% of your final grade, this activity will be submitted as an Assignment.

- *Section Final* – Section Leads, with input from Peer Review, and feedback from their graded drafts, will revise, smooth and submit Section Finals as an Assignment at the end of Week 8. Worth 15% of your final grade.

Grading:

Name	Grade %
Research Paper	20.00 %
Space Transportation Paper	20.00 %
Forum's	35.00 %
Forum Week 1	4.38 %
Forum Week 2	4.38 %
Forum Week 3	4.38 %
Forum Week 4	4.38 %
Forum Week 5	4.38 %
Forum Week 6	4.38 %
Forum Week 7	4.38 %
Forum Week 8	4.38 %
Class Project	45.00 %
Section Draft	20.00 %
Section Final	15.00 %
Mission Req / Assumptions	10.00 %

Materials

Book Title: Various resources from the APUS Library & the Open Web are used. Please visit <http://apus.libguides.com/er.php> to locate the course eReserve.

Author: N/A

Publication Info: N/A

ISBN: N/A

Required Course Textbooks

[Space Shuttle](#)

[X-15 Extending the Frontiers of flight](#)

[Critical Issues in the History of Spaceflight](#)

[A New Era in Space](#)

Additional Required Readings

Additional lecture material in the form of text and/or video links is located online in the classroom in each

week's lesson.

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 20% 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.

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.

<p>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.</p>
--