SPST425

Course Summary

Course : SPST425 **Title :** Satellite and Spacecraft Systems **Length of Course :** 8 **Faculty :**
Prerequisites : SPST200, SPST300 **Credit Hours :** 3

Description

Course Description:

Orbital satellites and spacecraft are discussed according to their application, design and environment. The power system, shielding and communication systems are reviewed along with their missions, space environment and limitations. This course elaborates on Space Station flight operations, its supporting elements and planned systems. Students will study commercial applications, logistical support, maintenance and servicing design concepts. (Prerequisites: SPST200 or SPST300) **Course Scope:**

This course is a background about Earth satellites, their principle payloads, and platforms. Since October 4, 1957 satellites have always been above the Earth in various orbits accomplishing different missions. As the years have passed these spacecraft have become more sophisticated and accomplish many routines that go virtually unnoticed in our modern world. Communications, surveillance, reconnaissance, navigation, scientific, and weather observations accomplish daily chore with amazing regularity. This course will discuss those satellite payloads and many more missions that have taken place since the beginning of the space age.

Objectives

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

- **CO-1** Identify major satellite components and how they operate.
- **CO-2** Describe the weather satellites and accomplishments.
- **CO-3** Explain the operations of Earth observation and navigation satellites.
- **CO-4** Analyze the operations of military satellites.
- **CO-5** Examine the operations and missions of science and technology satellites.

CO-6 Determine how human piloted satellites and interplanetary probes have changed perspectives of Earth and the Universe.

Outline

Week 1:

ASSIGNMENTS

Introduction Discussion

Discussion1 – Electrical Power Subsystem

Week 2:

ASSIGNMENTS

Discussion 2 – Computer and Data Handling Subsystem

Submit Homework#1

Week 3:

ASSIGNMENTS

Discussion 3 – Tracking, Telemetry and Control (TT&C)

Submit Homework #2

Week 4:

ASSIGNMENTS

Discussion 4 – Thermal Control Subsystem

Week 5:

ASSIGNMENTS

Discussion 5 – Structures and Mechanisms

Week 6:

ASSIGNMENT

Discussion 6 – Control Systems and Navigation, Guidance & Control

Submit Homework #3

Week 7:

ASSIGNMENTS

Discussion 7 – Attitude Determination and Control Subsystem

Submit Homework #4

Week 8:

ASSIGNMENT

Final Exam is due! The Final Examination is an open-book open-notes exercise accomplished in a take home format. You have a week to accomplish the problems. A word of warning: Don't wait until the last minute!

Evaluation

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

Final Exam

The final exam makes up 30 percent of your overall course grade. Questions will require you to have previously read the reading assignments in order to comprehend and correctly respond. The exam must be completed by the last day of the course. The final exam may be turned in up to one day late; however, the grade on the exam will be reduced by 50% if turned in after midnight ET on the last day of the course.

Homework

The homework makes up 40 percent of your overall course grade. Questions will require you to have previously read the chapter(s) assigned in order to comprehend and correctly respond to the questions. Grades on homework turned in after the assigned deadline date will be reduced by 10% per day that they are turned in late.

Discussion Board Participation

25 percent of your course grade is earned through participation with other students in the Discussion Board area of the classroom. Your knowledge of readings will be reflected in your ability to actively participate and discuss key course concepts. Post your responses as if you were participating in a face-to-face seminar.
There is no harm in admitting that you didn't know something and asking questions is highly encouraged.
Replies to at least two other student's posting is required to get full marks for each discussion. This is done to make this a more informal and interactive classroom environment.

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 on midnight Eastern Time the following **Sunday**.

If you have questions during the course, don't hesitate to contact the instructor either by email or through the message system or both.

Grading:

Name	Grade %
Discussions	27.00 %
Week 1: Introduce Yourself	3.00 %
Week 1: Electrical Power Subsystem	3.00 %
Week 2: Computer and Data Handling Subsystem	3.00 %
Week 3: Tracking Telemetry and Commanding	3.00 %
Week 4: Thermal Control Subsystem	3.00 %
Week 5: Structures and Mechanisms	3.00 %
Week 6: Spacecraft Control Systems and Orbit Control & Educational Goals	3.00 %
Week 7: Attitude Control Subsystem	3.00 %
Week 8: Final Debriefing	3.00 %
Homework	40.00 %
Homework #1	10.00 %
Homework #2	10.00 %
Homework #3	10.00 %
Homework #4	10.00 %
Midterm Exam	16.00 %
Midterm Exam	16.00 %
Final Exam	17.00 %
Final Exam	17.00 %

Materials

Book Title: Various resources from the APUS Library & the Open Web are used. Please visit eReserve to locate the course.

Author: No Author Specified

Publication Info:

ISBN: N/A

Software Requirements

- Microsoft Word

  A Note to Students using MS Office 2007:
  To ensure that your assignments can be shared across platforms, please save your documents as a Word 97-2003 document (.doc).
- Adobe Acrobat Reader (Free download)

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 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

- The University encourages all work to be completed according to the course schedule. The University Late Work Policy can be found in the Student Handbook here.

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 Discussion

- Discussions 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 discussion. The purpose of the discussions 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.