Space Studies (SPST)

SPST500 Research Methods in Space Studies (3 semester hours)
MUST BE TAKEN AS THE SECOND COURSE IN THE SPACE STUDIES PROGRAM. This course is designed to build the student's ability to organize and conduct research in the space studies discipline, and to enable the student to present findings in a clear, concise, coherent manner. It is devoted to thinking about research logically, creatively, critically, structurally and scientifically. Course material covers qualitative research designs, theory building, role of argumentation in presenting a research report (thesis), as well as describing and analyzing quantitative variables. IT IS HIGHLY RECOMMENDED THAT YOU HAVE PREVIOUSLY COMPLETED COLLEGE ALGEBRA BEFORE TAKING THIS COURSE.
View the course schedule (https://www.apus.edu/course-schedule/details.html?c=SPST500) to find out details about each course including prerequisites, course objectives, course materials, a snapshot of the syllabi, and session dates.

SPST501 Introduction to Space Studies (3 semester hours)
This course serves as an introduction to the APUS Space Studies Master's program. It describes on the main concentrations in Space Studies: Astronomy, Aerospace Science, Space Policy, and Space Entrepreneurship. It also focuses on the technical writing proficiency expectation for graduate study and the importance of the peer review process in scientific literature. The course explores both current and future directions in NASA space exploration. It also introduces the new United States Space Force (USSF), and considers the implications of the USSF for the direction of our country's space exploration policy.
View the course schedule (https://www.apus.edu/course-schedule/details.html?c=SPST501) to find out details about each course including prerequisites, course objectives, course materials, a snapshot of the syllabi, and session dates.

SPST502 Introduction to Orbital Mechanics (3 semester hours)
CORE COURSE: What is an orbit? How does a spacecraft fly to the Moon or Mars? What does NORAD use to track all of the satellites currently in orbit around Earth? How does a spacecraft move from one orbit to another? These questions and more are answered in this course. From Kepler and Newton to the modern telecommunications, navigation, and remote sensing spacecraft, knowledge of orbital mechanics is essential for the modern Space Manager to be able to plan future space missions and to converse with orbital analysts that perform the day-to-day calculations determining IT IS HIGHLY RECOMMENDED THAT YOU HAVE PREVIOUSLY COMPLETED COLLEGE ALGEBRA BEFORE TAKING THIS COURSE. (Prerequisites: SPST500 and SPST501)
View the course schedule (https://www.apus.edu/course-schedule/details.html?c=SPST502) to find out details about each course including prerequisites, course objectives, course materials, a snapshot of the syllabi, and session dates.

SPST503 Chronology of Space (3 semester hours)
This course takes an in-depth look at the past and current structure, tasking, goals and objectives of the U.S. National Aeronautics and Space Administration (NASA). Emphasis is placed on the roles of the individual research centers, space centers and laboratories that form the NASA organization. The origins and impact of the 'space race' are discussed in detail.
View the course schedule (https://www.apus.edu/course-schedule/details.html?c=SPST503) to find out details about each course including prerequisites, course objectives, course materials, a snapshot of the syllabi, and session dates.

SPST504 Remote Sensing Satellites (3 semester hours)
CORE COURSE: Earth orbiting remote sensing satellites play a key role in the lives of human beings. This course is a study of the major components of contemporary remote sensing satellites, the various methods of remote sensing capability, and the advantages and disadvantages of each method. Course topics also include study of remote sensing orbits, launch vehicles, and technology. IT IS HIGHLY RECOMMENDED THAT YOU HAVE PREVIOUSLY COMPLETED COLLEGE ALGEBRA BEFORE TAKING THIS COURSE. (Prerequisites: SPST500 and SPST501)
View the course schedule (https://www.apus.edu/course-schedule/details.html?c=SPST504) to find out details about each course including prerequisites, course objectives, course materials, a snapshot of the syllabi, and session dates.

SPST611 Aircraft Propulsion Systems (3 semester hours)
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.
View the course schedule (https://www.apus.edu/course-schedule/details.html?c=SPST611) to find out details about each course including prerequisites, course objectives, course materials, a snapshot of the syllabi, and session dates.

SPST612 Rocket Propulsion (3 semester hours)
Even though the Chinese introduced rockets about 800 years ago, most of the important rocket development has taken place in the 20th Century. This course introduces rocket theory including specific impulse, thrust chamber design, nozzle design, heat transfer, and propellant composition and places particular emphasis on the development and use of liquid and solid rockets. The course concludes with a discussion of the future of rocketry including hybrid rockets, thrust vector control, and electric rockets. The material in this course is applicable and essential for any military or civilian Space Operator, Manager, or Designer who wants to achieve a better understanding of how rockets are designed and how they operate. IT IS HIGHLY RECOMMENDED THAT YOU HAVE COMPLETED COLLEGE ALGEBRA PRIOR TO TAKING THIS COURSE.
View the course schedule (https://www.apus.edu/course-schedule/details.html?c=SPST612) to find out details about each course including prerequisites, course objectives, course materials, a snapshot of the syllabi, and session dates.

SPST613 Satellite Communications (3 semester hours)
CORE COURSE: This course is a study of the principles, architectures, technologies, management, economies, advantages, and disadvantages of satellite communications. Spacecraft launch vehicles, orbits, communications modulations, radio wave propagation, payload designs/types, and spacecraft bus and antenna types are all addressed. Students will learn to devise/formulate actual satellite communications link budgets and evaluate the impact of each variable used within the equation. IT IS HIGHLY RECOMMENDED THAT YOU HAVE PREVIOUSLY COMPLETED COLLEGE ALGEBRA BEFORE TAKING THIS COURSE. (Prerequisites: SPST500 and SPST501)
View the course schedule (https://www.apus.edu/course-schedule/details.html?c=SPST613) to find out details about each course including prerequisites, course objectives, course materials, a snapshot of the syllabi, and session dates.

SPST615 Aerodynamics (3 semester hours)
This course introduces the student to core concepts of aerodynamics, including fundamentals of inviscid, incompressible flow; compressible flow; shock waves/properties; compressible flow through nozzles, diffusers, and wind tunnels; subsonic compressible flow over airfoils; linear theory; elements of hypersonic flow, and boundary layers. IT IS HIGHLY RECOMMENDED THAT YOU HAVE PREVIOUSLY COMPLETED COLLEGE ALGEBRA AND CALCULUS I BEFORE TAKING THIS COURSE.
View the course schedule (https://www.apus.edu/course-schedule/details.html?c=SPST615) to find out details about each course including prerequisites, course objectives, course materials, a snapshot of the syllabi, and session dates.

SPST616 Aircraft Design (3 semester hours)
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.
View the course schedule (https://www.apus.edu/course-schedule/details.html?c=SPST616) to find out details about each course including prerequisites, course objectives, course materials, a snapshot of the syllabi, and session dates.

SPST619 The Psychology and Physiology of Space (3 semester hours)
This course is an overview of the human ability to function, work and live for extended periods of time in the environments of space, and interface with the systems supporting successful space travel. An important element of the space medicine / human factors is to develop standards, requirements, and policies to guide the planning, space systems design, and operation. This function also includes the ability to perform repairs and planetary surface investigation, future prospecting, and resource utilization. (Prerequisites: SPST500 and SPST501)
View the course schedule (https://www.apus.edu/course-schedule/details.html?c=SPST619) to find out details about each course including prerequisites, course objectives, course materials, a snapshot of the syllabi, and session dates.

SPST621 Current and Emerging Space Powers (3 semester hours)
Space exploration and exploitation have become global activities. While the United States and the Soviet Union were battling for supremacy during the Cold War and striving for "firsts" in the Space Race, several nascent space powers were blossoming in the background. Not limited to the U.S. and USSR, the dream of spaceflight sprouted in lands as diverse as France, Germany, China, Japan, India, Israel and Brazil. The European Space Agency, the Chinese Space Program, the Japanese Space Program and the Indian Space Program have become space powerhouses. A study of these various programs is essential to gain a thorough understanding that space exploration is not only a global enterprise, but also an important concern for our own national security.
View the course schedule (https://www.apus.edu/course-schedule/details.html?c=SPST621) to find out details about each course including prerequisites, course objectives, course materials, a snapshot of the syllabi, and session dates.

SPST622 Space Policy (3 semester hours)
Since the beginning of the Space Age, U.S. Civil Space Policy has been a cornerstone in determining space organizational structures, mission objectives, and resource distribution. From the launch of Explorer 1 through the Apollo Program Moon landings and continuing on to the Space Shuttle and International Space Station operations, the U.S. Government has been heavily involved in establishing space exploration and exploitation. A study of the various players in the space community, the various government interfaces, and an emphasis on budget development is important to study the roles that policy has played in our nation's space program.
View the course schedule (https://www.apus.edu/course-schedule/details.html?c=SPST622) to find out details about each course including prerequisites, course objectives, course materials, a snapshot of the syllabi, and session dates.

SPST623 National Space Organization (3 semester hours)
This course is a comparative study of the major industrialized nations' space organizations. It begins with the US and presents an overview of NASA and non-NASA government agencies supporting space exploration. Comparative views are presented for other countries which then allows the student to select the country of their choice (as approved by the instructor) to compare/contrast its space organization with that of the United States. Students will review the fundamental roles of significant space organization, budgets, and goals and objectives in comparison and contrast between the US and another country.
View the course schedule (https://www.apus.edu/course-schedule/details.html?c=SPST623) to find out details about each course including prerequisites, course objectives, course materials, a snapshot of the syllabi, and session dates.

SPST628 Space Operations Structure and Design (3 semester hours)
This course is a study of management issues involved in the vision, planning, design, structure and operations of new and existing facilities and vehicles. The course will include a review of existing vehicles and facilities and those that will be required in the upcoming quarter century.
View the course schedule (https://www.apus.edu/course-schedule/details.html?c=SPST628) to find out details about each course including prerequisites, course objectives, course materials, a snapshot of the syllabi, and session dates.

SPST630 Planetary and Solar System Studies (3 semester hours)
This course examines the exploration of the solar system with a focus on the methods used to explore the Sun, planets, moons, and small solar system bodies. Special emphasis is also placed on the space environment and its effects on current and future exploration activities. The threat of comet, asteroid, and meteoroid impacts on Earth will also be addressed. This course requires access to the web site MASTERING ASTRONOMY, and use of labs from the GEAS project website, which is supported by the NSF, and are used with permission. The link for GEAS labs is http://astronomy.nmsu.edu/geas/labs/html/home.shtml.
View the course schedule (https://www.apus.edu/course-schedule/details.html?c=SPST630) to find out details about each course including prerequisites, course objectives, course materials, a snapshot of the syllabi, and session dates.

SPST631 Astrophysical Studies (3 semester hours)
This course examines the study of stars and galaxies with special emphasis on the methods and instrumentation used in the exploration of the universe around us. Focus is also placed on cosmology, the study of the past, present, and possible future of the universe. (Prerequisite: SPST630). This course requires access to the web site MASTERING ASTRONOMY, and use of CLEA Labs, which are Windows only programs. If you are not using a Windows program, please verify that your system will be compatible with CLEA labs prior to registering for the course. The link for CLEA labs is http://www3.gettysburg.edu/~marschal/clea/CLEAhome.html.
View the course schedule (https://www.apus.edu/course-schedule/details.html?c=SPST631) to find out details about each course including prerequisites, course objectives, course materials, a snapshot of the syllabi, and session dates.

SPST632 Lunar Geology (3 semester hours)
This course examines the Moon in a systematic way, including the current theory of the origin of the Moon and processes such as impact cratering, volcanism, and tectonics. A detailed review of past manned/unmanned lunar geological exploration findings will also be addressed, along with critical aspects of lunar geology relevant to the return of humankind to the Moon.
View the course schedule (https://www.apus.edu/course-schedule/details.html?c=SPST632) to find out details about each course including prerequisites, course objectives, course materials, a snapshot of the syllabi, and session dates.

SPST633 Astronomical Instrumentation (3 semester hours)
This course examines the design and construction of astronomical instruments, including mechanical design and machining, optics and commensurate optical system design, and both real-time and near-real time computer control. UV, X-ray, and gamma-ray spectrum instrumentation will also be addressed.
View the course schedule (https://www.apus.edu/course-schedule/details.html?c=SPST633) to find out details about each course including prerequisites, course objectives, course materials, a snapshot of the syllabi, and session dates.

SPST634 Comets, Asteroids and Meteorites (3 semester hours)
Asteroids, meteorites, and comets, the leftover material from the formation of our solar system, are all key to understanding its origin. The composition, history and interrelationships of these objects will be covered, as well as their influence on the Earth and other bodies, and what they tell us about the early solar system.
View the course schedule (https://www.apus.edu/course-schedule/details.html?c=SPST634) to find out details about each course including prerequisites, course objectives, course materials, a snapshot of the syllabi, and session dates.

SPST635 History of Astronomy (3 semester hours)
This course reviews the historical significance and discoveries made by astronomers ranging from the early Greeks and Mayans through the discoveries of recent times using modern techniques and tools such as the Hubble Space Telescope. As both a history class and a science class, this course bridges the two by examining the interconnection of the events and people involved in astronomy through the ages as well as analyzing the observations that have formed the core of humanity's effort to understand and describe what we see around us. The majority of the course materials are primary sources, as students will read many of the original papers that have brought us to our current understanding of the universe. A major component of this course is learning to interpret history for different audiences in a wide variety of writing assignments.
View the course schedule (https://www.apus.edu/course-schedule/details.html?c=SPST635) to find out details about each course including prerequisites, course objectives, course materials, a snapshot of the syllabi, and session dates.

SPST640 Space Cooperation and Diplomacy (3 semester hours)
This course will examine the importance of international space cooperation and diplomacy, enabling all nations, states, and consortiums to enjoy the benefits of space technology and ensuring the safety, stability, and security of outer space. Students will work in teams or individually and think critically about the importance of cooperating with both allies and if necessary, adversaries, to develop potential solutions to the world's most critical and complex problems in space. Some of the topics of discussion will include the history of civilian and military space development; the ongoing debate on weapons in space; the past and current policy and guidance on space activities; the current threats to the safety and stability of space operations; the types of International cooperation; and a discussion of the cooperation strategies the US should pursue.
View the course schedule (https://www.apus.edu/course-schedule/details.html?c=SPST640) to find out details about each course including prerequisites, course objectives, course materials, a snapshot of the syllabi, and session dates.

SPST650 Fundamentals of Earth and Planetary Sciences (3 semester hours)
A required course for the graduate concentration in Earth and Planetary Sciences, this survey course provides an overview of key concepts, dominant paradigms, and research frontiers in Earth and planetary sciences. The course provides a required foundation for all incoming students pursuing the Earth and Planetary Sciences concentration within Space Studies. Topics include an overview of the solar system, planetary geology, planetary atmospheres, and planetary mapping. (Prerequisite: SPST501)
View the course schedule (https://www.apus.edu/course-schedule/details.html?c=SPST650) to find out details about each course including prerequisites, course objectives, course materials, a snapshot of the syllabi, and session dates.

SPST651 Planetary Geology (3 semester hours)
SPST651 Planetary GeologyOver the past decades, spacecraft exploration and related laboratory research on extraterrestrial materials have given us a new understanding of planets and how they are shaped by geological processes. This course will focus on geologic processes, adopting a comparative approach that demonstrates the similarities and differences between planets, and the reasons for these. This course will integrate data from past and present space exploration missions to compare processes operating on the surface of the Earth to processes operating on the surface of other celestial objects. Aspects of mineralogy, petrology, geochemistry, volcanology, sedimentology, geomorphology, tectonics, geophysics, and remote sensing will be used to examine this data and apply it to the geology of rocky bodies in the solar system as well as known exoplanets. (Prerequisite: SPST650)
View the course schedule (https://www.apus.edu/course-schedule/details.html?c=SPST651) to find out details about each course including prerequisites, course objectives, course materials, a snapshot of the syllabi, and session dates.

SPST652 Geology of the Moon and Mars (3 semester hours)
This course examines the processes which have shaped, and continue to shape, both the surfaces and interiors of the Moon and Mars, such as impact cratering, volcanism, and tectonics. A detailed review of past and current manned/unmanned geological exploration of each body will also be addressed. Critical aspects of the Lunar and Martian geology and environments relevant to human exploration and possible future settlements will be emphasized. (Prerequisite: SPST651)
View the course schedule (https://www.apus.edu/course-schedule/details.html?c=SPST652) to find out details about each course including prerequisites, course objectives, course materials, a snapshot of the syllabi, and session dates.

SPST653 Small Bodies of the Solar System (3 semester hours)
This class will cover a variety of objects within the solar system considered "small." This includes dwarf planets, moons, asteroids, meteorites, comets, and planetary rings. We will cover the composition, history, and role of these objects within the solar system. We will also address their influence on the Earth and other bodies, and what they tell us about the formation of planetary systems around other stars.
View the course schedule (https://www.apus.edu/course-schedule/details.html?c=SPST653) to find out details about each course including prerequisites, course objectives, course materials, a snapshot of the syllabi, and session dates.

SPST654 Planetary Mapping (3 semester hours)
This course provides an introduction to the concepts and techniques used for mapping Earth and other planets. This includes the fundamentals of remote sensing and the applications of geographic information systems in terrestrial and extraterrestrial environments.
View the course schedule (https://www.apus.edu/course-schedule/details.html?c=SPST654) to find out details about each course including prerequisites, course objectives, course materials, a snapshot of the syllabi, and session dates.

SPST655 Planetary Atmospheres (3 semester hours)
This course provides an overview of planetary atmospheres. The atmospheres of Earth, Venus, Mars, and Saturn's moon Titan are considered in detail. Atmospheres of planets orbiting other stars (exoplanets) are also considered.
View the course schedule (https://www.apus.edu/course-schedule/details.html?c=SPST655) to find out details about each course including prerequisites, course objectives, course materials, a snapshot of the syllabi, and session dates.

SPST671 Space Law (3 semester hours)
This course examines space law from its origins at the commencement of space exploration to current day activities, including civilian, commercial and military/governmental issues/rulings. The Outer Space Treaty, Registration Convention, Rescue and Return Agreement, Liability Convention, and the Moon Treaty will be covered in detail, as will several other past, standing and pending legal works.
View the course schedule (https://www.apus.edu/course-schedule/details.html?c=SPST671) to find out details about each course including prerequisites, course objectives, course materials, a snapshot of the syllabi, and session dates.

SPST690 Independent Study: Space Studies (3 semester hours)
An opportunity for Space Studies students to pursue an independent research project or examine a specific area of Space Studies under the mentorship of a single professor. Students must complete 24 credits of study before taking this course. Participation is at the discretion of the faculty member. The course will typically involve six or more telephone calls and produce a major research paper (50+ pages); there will be no examination. Students will submit a proposal prior to the start of the project, and a rough draft of the paper at week 10, both of which will count toward the final grade. Prerequisite: University approval and Upper Level standing. Prior to registering, students should first contact the professor with whom they wish to mentor their independent study, coordinate an agreement on the grading requirements, and then NOTIFY their academic advisor with the name of their professor.
View the course schedule (https://www.apus.edu/course-schedule/details.html?c=SPST690) to find out details about each course including prerequisites, course objectives, course materials, a snapshot of the syllabi, and session dates.

SPST695 Space Studies Capstone Portfolio (3 semester hours)
The portfolio course is designed as an alternative to the SPST699 Capstone Thesis course. The proposed Capstone Portfolio course is an opportunity for students to demonstrate mastery of all the program learning objectives, including a platform to articulate other scholarly work with the professional digital portfolio being built using portfolium software. Students are expected to submit all required components of the portfolio, including keystone assignments from the program which demonstrate mastery of all program objectives. The proposal will also include a forty - fifty page document that is a reflection of the student's graduate experience, summarizing accomplishments, including past and future research efforts. The student will be expected to present the portfolio in an interview-style assessment to a committee of program faculty at the culmination of the course. NOTE: This course may not be taken until all other courses are COMPLETED and student has a 3.0 GPA. THIS COURSE IS 8 WEEKS.
View the course schedule (https://www.apus.edu/course-schedule/details.html?c=SPST695) to find out details about each course including prerequisites, course objectives, course materials, a snapshot of the syllabi, and session dates.

SPST699 Space Studies Capstone (3 semester hours)

Preparation for the Master of Science in Space Studies Thesis begins on day one of a student's graduate program of study. The theories, research methods, analytical skills, and substantive knowledge obtained through the Space Studies curriculum provide the basis for the thesis project. In this course, instructors guide students through the thesis process. Students are expected to submit all required components of the research process, including a thesis proposal. The thesis proposal must provide a clear description of a contestable question or problem and a proposed method of answering the question or solving the problem. The thesis requires students to present an original argument using proper academic writing conventions including carefully documented primary and/or secondary sources. Guidance on the format of the thesis and proposal are contained in the APUS End of Program Manual. NOTE: This course may not be taken until all other courses are COMPLETED and student has a 3.0 GPA.THIS COURSE IS 16 WEEKS.

View the course schedule (https://www.apus.edu/course-schedule/details.html?c=SPST699) to find out details about each course including prerequisites, course objectives, course materials, a snapshot of the syllabi, and session dates.