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Space Policy

PUP 4510-19Fall 0W60

Fall 2019

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Overview

Official catalog description: **"An examination of the politics and policy-making involved with the US space program in the context of domestic demands and other international space programs."**

Space policy remains a field that stands astride both the future and history in its scope, both idealistic and in very practical terms. That means the quest to reach and explore outer space began many years ago as futuristic dreams and visions and is presently being pursued as an everyday reality in the commercial sector. This course focuses upon the development of human activity across all its manifestations: civil, scientific, commercial, and military. The primary focus here is upon the civil, scientific and commercial aspects involving the United States with some discussion of other states efforts. Another course, INR 4774 – Military Space Policy, deals explicitly with military space policy – a field of burgeoning interest to a multitude of states. A third course, INR 4765 - Emerging Space Powers focuses on the usefulness of space activities for economic and social

development especially for underdeveloped states. Space policy as a field arose out of the dreams of visionaries but came to its first fruition as part of the now defunct Cold War competition between the United States and the former Soviet Union, now the Russian Federation.

That international political and military competition created a policy dichotomy between military and nonmilitary that still impacts the field when people ask whether a specific space application is dual use or not? That is: can the same technology with minimal modifications be employed for both military or civilian purposes? For example, the same rocket can serve as a launch vehicle taking a satellite to orbit or a ballistic missile carrying a warhead to a distant target. Most space applications clearly have this dual use nature. The original launch vehicles used by NASA for example were converted military missile launchers, the Redstone, Juno and Atlas for example. This however does not mean the technologies involve weapons. For example, the Global Positioning System (GPS) is a technology of tremendous economic value for the commercial sector even though its original purposes were clearly military in nature. Related to this concern with the possible military implications is the related question of cost/benefit: are space activities worth their high cost when there exist so many social/economic problems to be solved on Earth?

At one time, the thought was that space activities were mostly a cost rather than a benefit once you moved away from the obvious military applications. For that reason, the initial assumption was that only economically developed states would participate although all states regardless of level of economic development might benefit. In pursuit of the latter point, early international efforts were made to provide satellite based communications for less developed states through the International Telecommunications Satellite Consortium (INTELSAT). The Soviets and their allies created another organization similar in purpose but with less coverage called Intersputnik. INTELSAT also became the organization through which the United States retained control over access to earth orbit by other allied states for commercial purposes. Military applications were considered one of a kind and not relevant for societal purposes. Since the end of the Cold War in 1991, the answer has changed based on past performance and current results including even poorer states especially because future space applications hold the potential to become an even more useful one for broader societal purposes. Poorer societies can benefit due to the ability of earth orbiting satellites to provide disaster warnings such as identifying growing droughts or the spread of disease or weather patterns likely damaging such as hurricanes. Remember the first images from space of weather formations such as hurricanes did not become available until the

1960s. In the current weather environment, the damage done without space observation would be significantly worse as storms arise and move with great rapidity and power.

What is so particularly challenging for the United States currently is that the vision that sustained the 1960s Apollo Program and the International Space Station (ISS) has politically run its course. This issue is best symbolized by the 2011 end of the Space Shuttle program with no immediate successor flight program on the horizon. Where the U.S. space program goes from here is being intensely debated but any definitive decision is not coming quickly because any government led program demands long term funding and commitment by Congress and the U.S. people. In an era of deficits, battles over national debt, and partisan gridlock, a large scale civil space program is unlikely unless the aliens show up on our door step. Presidents can only propose but only Congress and ultimately the public decide how far things will proceed. The public remains supportive but only in a general sense. International competitors exist at least rhetorically to the U.S. and Russia but the test becomes their willingness to continue expending large amounts of precious capital for increasing less political advantage. China appears to have made that commitment.

Private sector solutions flounder on the fact that the companies ultimately must make a profit or receive a subsidy from some source usually thought of as the government. Going to Mars while intriguing even exciting does not hold any obvious profits for the private sector which would pay for the effort. What that means is that most private sector proposals initially assume the government supports the effort; otherwise, it will not happen. That is only slowly changing but questions of mining asteroids and going to other celestial bodies are only emerging while confronting significant cost issues plus any product mined from an asteroid has be extraordinarily valuable to justify returning it to Earth. Going to outer space costs between $5,000 to $10,000 per pound to reach low earth orbit never mind going out to the mining site either on the Moon or some other celestial body. Flight costs may decline given the possibilities for reusable launch vehicles but the amount of the decline remains unclear. SpaceX now reuses part of its Falcon 9 launch vehicle but prices are not declining as rapidly as many hoped originally.

Conceptually, the space field began as an extension of the Cold War political-military competition. Thus, its content and structure reflects those military origins while its history also illustrates the difficult process of disengaging the nonmilitary sector from those roots. That separation process is a slow and difficult one, but necessary if the full potential of space activities is to be realized for humanity's

sake. The continuing U.S. political controversy over technology exports to China and other states is rooted in that earlier restrictive political-military perspective. Generally speaking, almost all space technologies are clearly dual use in nature; meaning the same rocket can carry either a satellite to orbit or a warhead to a target across the globe. Caution therefore characterizes the American response to fostering that technology's wider dissemination. However, regardless of U.S. concerns, other states, both U.S. friends and more hostile states, are demonstrating their independent capability to develop space technologies equivalent to U.S. technologies or even better in some cases.

Remember space activities by their very nature are the essence of international activities. From Earth orbit or the Moon's surface during the Apollo flights, there are no national boundaries visible on Earth even though the individuals who enter outer space have all come as representatives of both humanity and their particular nation. By the end of the 21st century, many hope that individual humans will go forth only as representatives of humanity. Saying that outer space is international however does not make it so. Individual states remain very concerned about the possible military and commercial implications of using outer space. The United States especially considers outer space both as a growing economic asset and a potential future field for military conflict. How American concerns play out in the larger international political system remains an issue because the United States has been the most willing to expend the economic resources necessary to make its concerns important enough for other states to address.

Text Materials:

Materials will appear as links to be found on the web. Reading assignments are incorporated into the modules as links to articles and a textbook. Students are responsible for keeping current with reading assignments.

Michael A. G. Michaud – *Reaching for the High Frontier: The American Pro-space movement, 1972-1984* (Westport, CT: Praeger Books, 1986). This book is out of print but can be found at the following web location: http://www.nss.org/resources/library/spacemovement/index.htm (Links to an external site.)

Other materials will be drawn from NASA history volumes and Roger Handberg - *International Space Commerce, Building from Scratch, those* chapters are attached to modules when germane. These chapters provide historical background for the materials in the modules.

Course Objectives:

Students will acquire a general understanding of the historical foundations, present context and future development of outer space as an arena for human activities. As part of that process, students will

1. Develop an understanding of the field's historical development.
2. Understand the influence of technology and politics upon the development of space activities. Space activities are immersed in politics often to the engineers dismay but a reality that must be addressed.
3. Develop an understanding of the international implications of space activities.
4. Become aware of the organizational forums and processes (public, private and international sectors) through which outer space is accessed and exploited for human benefit.
5. Develop an appreciation for the human and economic developmental potential inherent in space activities.
6. Analyze the changing parameters of space policy as we move through the 21st century especially the rapidly changing nature of military space activity.
7. Demonstrate the ability to access information regarding ongoing space activities and proposed future activities.
8. Learn how to write sophisticated analyses of issues within the ambit of space policy both internationally and domestically.

Communicating within the Course

In this class our official mode of communication is through email located inside Canvas or to roger.handberg@ucf.edu. All communications between student and instructor and between student to student should be respectful and professional. It is the student's responsibility to check the course email tool frequently to keep current with any announcements. You must also create a Knight's Email account at www.knightsemail.ucf.edu for separate official communications from the university or the instructor. Inquires about your grade or other aspects of the course can only be answered through the Knight's email system, not Yahoo, Gmail or other commercial vendors. This is a university policy required by federal law, the instructor is not authorized to ignore. If you are able, you can meet with the instructor during normal office hours or make an appointment for other times as necessary.

Grade Structure:

Grades are determined through a variety of student activities including two examinations taken on line through the course quiz function, three assignments completed on the web, and a web link search for extra credit. The overall weight assigned to each activity is shown below with a brief description provided for each facet. Due dates items are due is provided in the syllabus section of the course website plus in the module where the assignment is announced with due date. A total of 1000 points will be assigned across the semester with each graded segment assigned a point value. Final grades will be recorded as A, B, C., etc rather than incorporating pluses and minuses. Grades are posted through the course website and accessible as soon as the materials are graded and released. The fifty (50) points possible for the extra-credit assignment - Module 0 is added to your total for the other required components of the course. The introductory assignment is voluntary but once passed can not be resurrected as an option.

Plagiarism and Cheating of any kind on an examination, quiz, or assignment will result at least in an "F" for that assignment (and **may** depending on the severity of the case, lead to an "F" for the entire course). such actions will be also subject to appropriate referral to the Office of Student Conduct for further action. See the UCF Golden Rule for further information, http://goldenrule.sdes.ucf.edu/. I will assume for this course that you will adhere to the academic creed of this University and will maintain the highest standards of academic integrity. In other words, don't cheat by giving answers to others or taking them from anyone else. I will also adhere to the highest standards of academic integrity, so please do not ask me to change (or expect me to change) your grade illegitimately or to bend or break rules for one person that will not apply to everyone.

Examination – 20 %

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Assignments– 60% total (total of three assignments across the term)

Introductory Assignment – 5% - extra credit –only opportunity for extra credit provided during the term, once the introductory assignment close; no other extra credit opportunities will be made available. There are discussions as part of several modules, you must participate in the discussions if you wish to have any consideration given if your final grade ends up on the cusp of an "A" or a "B," etc. The instructor at the end of the term will assess whether you have participated in discussions or not, if not, no additional consideration will be given if your grade is

between a letter grade or not. If you chose not to participate there is no punishment, this is strictly an add if necessary.

NOTE: All assignments and other submissions are to be done in MS Word format; otherwise, I am unable to open the document. This may lead to a delay in grading the materials while you resubmit the assignment. A second occurrence will result in a "zero" for the assignment. This restriction means no Word Perfect, MS Works or other word processing programs are accepted. If you use word through an Apple device, that is possible but your responsibility is to make sure I can open the document.

Examinations can incorporate both essay and short answer formats. Students will be queried as to their understanding of the processes engaged in developing space policy. The Assignments will test student understanding of different information and concepts discussed in the modules and in the readings. The Introductory Assignment involves students completing several simple tasks and demonstrating certain techniques related to successfully completing the course. This is the only extra credit assignment available during this course so do not ask for additional attempts at extra credit.

The Web Link Annotation as part of the Extra Credit involves students locating Internet links not already identified in the course. Their assignment becomes annotating (describing and evaluating) in general terms the particular site's content, usability and then make some assessment as to its validity, usefulness and reliability as a possible source of information including its sponsor. Simply put, is the link worth accessing or not? Much of the material on the Web is of dubious reliability, becoming a critical content evaluator and consumer of information is an important part of the course.

Course Assignments:

In this segment of the course, all students are to participate by completing the assignment as specified in the modules. You will have adequate time to complete the assignment based on reading modules, assigned readings and research through the web or library. **Assignments are to be a minimum of 1,500 words, 10 references (not including the textbooks or modules which can be cited and used but not counted as part of the required total), only half can be solely web although library journal articles accessed through the Library website are not considered web only. Wikipedia is not an acceptable reference; points will be deducted for its use, a second use will lead to a failing grade for the**

assignment. Remember assignments must be in Word format. Late assignments are graded down a letter grade a day until an F grade is reached (meaning closed four days after due date). For assignment formatting, you must use the referencing system used by the American Political Science Review which is available on line at this location: http://uncg.libguides.com/apsr (Links to an external site.) or you can google the style guide.

UCF Core Syllabus Statements

Academic Integrity

Students should familiarize themselves with UCF's Rules of Conduct at <http://osc.sdes.ucf.edu/process/roc>. According to Section 1, "Academic Misconduct," students are prohibited from engaging in

1. Unauthorized assistance: Using or attempting to use unauthorized materials, information or study aids in any academic exercise unless specifically authorized by the instructor of record. The unauthorized possession of examination or course-related material also constitutes cheating.
2. Communication to another through written, visual, electronic, or oral means: The presentation of material which has not been studied or learned, but rather was obtained through someone else's efforts and used as part of an examination, course assignment, or project.
3. Commercial Use of Academic Material: Selling of course material to another person, student, and/or uploading course material to a third-party vendor without authorization or without the express written permission of the university and the instructor. Course materials include but are not limited to class notes, Instructor's PowerPoints, course syllabi, tests, quizzes, labs, instruction sheets, homework, study guides, handouts, etc.
4. Falsifying or misrepresenting the student's own academic work.
5. Plagiarism: Using or appropriating another's work without any indication of the source, thereby attempting to convey the impression that such work is the student's own.
6. Multiple Submissions: Submitting the same academic work for credit more than once without the express written permission of the instructor.
7. Helping another violate academic behavior standards.

For more information about Academic Integrity, consult the International Center for Academic Integrity <http://academicintegrity.org (Links to an external site.)>.

For more information about plagiarism and misuse of sources, see "Defining and Avoiding Plagiarism: The WPA Statement on Best Practices" <http://wpacouncil.org/node/9 (Links to an external site.)>.

Responses to Academic Dishonesty, Plagiarism, or Cheating

Students should also familiarize themselves with the procedures for academic misconduct in UCF's student handbook, *The Golden Rule* <http://goldenrule.sdes.ucf.edu/docs/goldenrule.pdf>. UCF faculty members have a responsibility for students' education and the value of a UCF degree, and so seek to prevent unethical behavior and when necessary respond to academic misconduct. Penalties can include a failing grade in an assignment or in the course, suspension or expulsion from the university, and/or a "Z Designation" on a student's official transcript indicating academic dishonesty, where the final grade for this course will be preceded by the letter Z. For more information about the Z Designation, see <http://goldenrule.sdes.ucf.edu/zgrade>.

Course Accessibility Statement

The University of Central Florida is committed to providing access and inclusion for all persons with disabilities. Students with disabilities who need access to course content due to course design limitations should contact the professor as soon as possible. Students should also connect with Student Accessibility Services (SAS) <http://sas.sdes.ucf.edu/> (Ferrell Commons 185, sas@ucf.edu, phone 407-823-2371). For students connected with SAS, a Course Accessibility Letter may be created and sent to professors, which informs faculty of potential course access and accommodations that might be necessary and reasonable. Determining reasonable access and accommodations requires consideration of the course design, course learning objectives and the individual academic and course barriers experienced by the student. Further conversation with SAS, faculty and the student may be warranted to ensure an accessible course experience.

Campus Safety Statement

Emergencies on campus are rare, but if one should arise during class, everyone needs to work together. Students should be aware of their surroundings and familiar with some basic safety and security concepts.

- In case of an emergency, dial 911 for assistance.
- Every UCF classroom contains an emergency procedure guide posted on a wall near the door. Students should make a note of the guide's physical location and review the online version at <http://emergency.ucf.edu/emergency_guide.html>.
- Students should know the evacuation routes from each of their classrooms and have a plan for finding safety in case of an emergency.
- If there is a medical emergency during class, students may need to access a first-aid kit or AED (Automated External Defibrillator). To learn where those are located, see <http://www.ehs.ucf.edu/AEDlocations-UCF> (click on link from menu on left).
- To stay informed about emergency situations, students can sign up to receive UCF text alerts by going to <https://my.ucf.edu> and logging in. Click on "Student Self Service" located on the left side of the screen in the toolbar, scroll down to the blue "Personal Information" heading on the Student Center screen, click on "UCF Alert", fill out the information, including e-mail address, cell phone number, and cell phone provider, click "Apply" to save the changes, and then click "OK."

- Students with special needs related to emergency situations should speak with their instructors outside of class.
- To learn about how to manage an active-shooter situation on campus or elsewhere, consider viewing this video (<You CAN Survive an Active Shooter (Links to an external

site.) >).

Campus Safety Statement for Students in Online-Only Courses

Though most emergency situations are primarily relevant to courses that meet in person, such incidents can also impact online students, either when they are on or near campus to participate in other courses or activities or when their course work is affected by off-campus emergencies. The following policies apply to courses in online modalities.

- To stay informed about emergency situations, students can sign up to receive UCF text alerts by going to <https://my.ucf.edu> and logging in. Click on "Student Self Service" located on the left side of the screen in the toolbar, scroll down to the blue "Personal Information" heading on the Student Center screen, click on "UCF Alert", fill out the information, including e-mail address, cell phone number, and cell phone provider, click "Apply" to save the changes, and then click "OK."
- Students with special needs related to emergency situations should speak with their instructors outside of class.

Deployed Active Duty Military Students

Students who are deployed active duty military and/or National Guard personnel and require accommodation should contact their instructors as soon as possible after the semester begins and/or after they receive notification of deployment to make related arrangements.

Make-Up Assignments for Authorized University Events or Co-curricular Activities

Students who represent the university in an authorized event or activity (for example, student-athletes) and who are unable to meet a course deadline due to a conflict with that event must provide the instructor with documentation in advance to arrange a make-up. No penalty will be applied. For more information, see the UCF policy at <http://policies.ucf.edu/documents/4-401.2MakeUpAssignmentsorAuthUnivEventsorCocurricularActivities.pdf>

Religious Observances

Students must notify their instructor in advance if they intend to miss class for a religious observance. For more information, see the UCF policy at <http://regulations.ucf.edu/chapter5/documents/5.020ReligiousObservancesFINALJan19.pdf>.

PUP 4510- Space Policy

Schedule/Syllabus – Fall 2019

Module #	Module name	Date Open	Date Close	Assignment
Module 0	Getting Started	21 August	6 September at 11 pm	Complete extra credit in Module 0 including posting web annotation to the drop box
Financial Aid Verification		August 26	September 2nd at 11pm	complete assignment if receive financial aid, otherwise may lose financial aid
Module 1	Introduction - Historical, the Space Age's Beginnings Through Apollo, the Future	26 August	September 2 at 11 pm	Read Materials and respond to Discussion Group: "Was the Apollo Program a Freak of the Cold War? Work on Assignment 1
Assignment 1	Assignment 1	August 26	**September 16 by 11 pm**	Turn in Assignment 1
Module 2	Organizing Space: U.S. Government	3 September	September 20 at 11 pm	Begin Work on Assignment 2
Module 3	Organizing Space: Other Governments	21 September	September 27 at 11 pm	Work on Assignment 2
Module 4	Organizing Space: Private/Public Interface	28 September	7 October at 11 pm	Read materials and respond to Discussion Group: "Can the Private Sector

				Actually Conduct Exploration?" work on Assignment 2
First Test	**Test**	**7 October**	**10 October at 11pm**	Complete exam on line
Module 5	Commercial Space Futures	11 October	24 October by 11 pm	Complete Readings
Assignment 2	**Assignment 2**	12 September	**21 October by 11 pm**	**Turn in Assignment 2**
Module 6	Space Lift	25 October	31 October at 11 pm	Complete readings & respond to discussion "Fixing Space Lift"
Module 7	Space Station's Future and that of Space Stations Generally	1 November	8 November at 11 pm	Complete readings & Respond to Discussion Group:"Should there be another Space Station, who pays?"
Module 8	Space Science	9 November	15 November at 11 pm	Complete readings
Assignment 3	**Assignment 3**	**October 25**	**11 November at 2300 hours**	**Complete Assignment 3**
Module 9	Human Spaceflight	16 November	24 November at 11 pm	Complete readings
Module 10	The Future, Commercial and Other	25 November	1 December at 11 pm	Complete readings & Respond to "Will Humans ever reach another star?"
Test 2	**Test**	**2 December**	**5 December at 11 pm**	**Complete exam on line**