Roger Handberg

INR 4765- Emerging Space Powers

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Course Home Page

Emerging Space Powers

INR 4765

Spring 2024

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Official UCF Catalog Course Description

Credit Hours: 3
Class Hours: 3
Lab and Field Work Hours: 0
Contact Hours: 3
Prerequisite(s): POS 2041, or C.I. Corequisite(s): None. Prerequisite(s) or Corequisite(s): None.

Examination of states' efforts to develop space technologies for purposes of economic, social and military development.

Overview

Space policy remains a field that stands astride both the future and history in its scope, both idealistic and very practical. 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 across various sector of human life. This course focuses upon the use of space applications for the economic and social development of states across the globe with the military implications always lingering in the background. The primary focus here is upon the use of space for national development as different states define that goal. Two courses, one being PUP 4510 Space Policy deals with the development of the American space program while the other course, INR 4774 – Military Space Policy, deals explicitly with military space policy – a field of burgeoning interest to a multitude of 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 and 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 possess this dual use nature.

For emerging states, there are two paths to engaging in space activities. One builds off national efforts to develop missiles which are later converted to launch vehicles but the other which is more common is that a state identifies an economic or social goal that requires space based applications in order to be achieved. These states in effect operate on the fringes of the first world space programs, benefiting from their technology development but moving in their own directions. An example of the first path would be China which initiated a missile program which morphed to include the developmental aspects of space while India's space program began originally and still heavily influenced by the expectation that space activities must assist the society in improving its level of economic development.

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.

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 go. 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 remains their willingness to continue expending large amounts of precious human and economic capital for increasing less political advantage. China appears to have made that commitment. Private sector solutions flounder on the fact that the companies must make a profit. 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 assume the government must support the effort; otherwise, it will not happen. This is even clearer in the context of developing states where the government is expected to lead. Efforts to spin off space technologies to the private sector remain problematic in developing countries.

Conceptually, space activities 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 even in developing countries. 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. That perspective assumed that states outside the developed world were incapable of building indigenously similar technologies. 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

the independent capability to develop space technologies equivalent to U.S. technologies or even better in some cases.

Text Materials:

Text materials will appear in several forms: excerpts from a book and materials found on the web. Reading assignments will appear in the modules along with other readings you are responsible for completing. Students are responsible for keeping current with reading assignments. Reading assignments are specified 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 especially in the developing states. 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 national development of space activities. Space activities are immersed in politics often to the engineers' dismay but a reality that exists.
3. Develop an understanding of the international implications of space activities and its evolution as field as new states enter the field.
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 for states new to the field.
7. Demonstrate the ability to access information regarding various states ongoing space activities and proposed future activities.
8. Learn how to write sophisticated analyses of issues within the ambit of space policy globally.

Communicating within the Course

In this class our official mode of communication is through email located inside Canvas or through roger.handberg@ucf.edu. All communications between student and instructor and between student and 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 create a UCF official email system for any inquires about your grade or other aspects of the course which can only be answered through the UCF 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.

Financial Aid Assignment:

There is a Financial Aid Assignment that all students receiving financial aid must complete in a timely manner in order to verify their attendance in the course, go to the Assignments tab to locate that requirement. Failure to complete this assignment could lead to you being required to immediately repay loans or not receive your financial aid. This is a federal requirement being enforced at UCF through Financial Aid.

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 assignments section of the course website. 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.

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://goldenru l e.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 included in several modules; you must participate in the discussions if you wish to have any instructor 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.

Examinations can incorporate both essay and short answer formats but more usually are essay format. 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 answering several questions about the course assignments 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. **All assignments are to be a minimum of 1,500 words, 10 references (not including the textbook or modules), only half can be solely web although library journal articles accessed through the UCF Library website are not considered web only. Pages in the assignment should be numbered. 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.**

Formatting for Assignments, proposals and papers:

Papers should be 10 or 12 point font, double space or 1.5 space between sentences with page numbers. Use APA format as described in UCF Library resources: https://guides.ucf.edu/apa. Links to an external site. Do not provide an abstract of the assignment. **Provide page numbers for your assignments.**

All web references must include the website's URL and the date you accessed the website. Proper citation is important especially since I reserve the right to check on your cite as to relevance and accuracy. Do not list references you have not read.

Other applicable University Policies are listed below:

Academic Integrity

Students should familiarize themselves with UCF's Rules of ConductLinks to an external site.. 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, students may consult The Center for Academic Integrity (Links to an external site.)

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 (Links to an external site.)

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 RuleLinks to an external site.*. 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, click hereLinks to an external site.

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 disability-related access in this course 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). Through Student Accessibility Services, a Course Accessibility Letter may be created and sent to professors, which informs faculty of potential access and accommodations that might be 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.

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.htmlLinks to an external site..

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/workplacesafety.htmlLinks to an external site. (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 ucf.eduLinks to an external site. 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 (Links to an external site.)

Links to an external site.

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 ucf.eduLinks to an external site. 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.

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 policyLinks to an external site.

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 policyLinks to an external site.

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.

For those classes where you want to selectively use Turnitin.com, here is a sample syllabus statement:

In this course we may utilize turnitin.com, an automated system which instructors can use to quickly and easily compare each student's assignment with billions of web sites, as well as an enormous database of student papers that grows with each submission. Accordingly, you may be expected to submit assignments in electronic format. After the assignment is processed, as an instructor I receive a report from turnitin.com that states if and how another author's work was used in the assignment. For a more detailed look at this process, visit http://www.turnitin.com

Links to an external site.

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Syllabus/Schedule – Spring 2024

Module #	Module name	Date Open	Date Close	Assignment* Remember Reading Assignments in the Modules
Module 0	Getting Started	January 8th	January 22nd at 11pm	Complete extra credit in Module 0 including posting web annotation to the drop box
Financial Aid Verification	**Financial Aid Verification**	**January 8th**	**January 15th**	**Complete Financial Aid Verification by January 16th, do not ignore may lead to financial aid issues, complete even if past due date.**
Module 1	Introduction - Historical, the Space Age's Beginnings, Determining Why Space Activities?	January 8th	January 20th at 11pm	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**	**January 8th**	**January 30th at 11pm**	**Turn in Assignment 1**
Module 2	Organizing Space, Determining Level of Engagement in Space Activities	January 21st	January 31st at 11pm	Complete Work on Assignment 1
Module 3	Organizing Space Internationally, the International Space Infrastructure	January 30th	February 8th at 11pm	Begin Work on Assignment 2
Module 4	Organizing Space, Dual Use Technology Issues	February 10th	February 17th at 11pm	Read materials and respond to Discussion Group: "Can Rising Space powers operate without interference?" work on Assignment 2
First Test	**Test**	**February 17th**	**February 20th at 11pm**	**Complete exam on line**
Module 5	Enter the Second Wave	February 21st	March 2nd at 11pm	Complete Readings
Assignment 2	**Assignment 2**	**January 31st**	**March 8th at 11pm**	**Turn in Assignment 2**
Module 6	Enter the Third Wave	March 3rd	March 17th at 11pm	Complete readings
Spring Break	**Spring Break**	**March 18th**	**March 23rd**	**be safe**
Module 7	Enter the Fourth Wave	March 24th	April 2nd at 11pm	Start Assignment 3, Complete readings & Respond to "should there be unlimited access to space based media?"
Module 8	Space Science, Frill or Symbol or Necessity?	April 2nd	April 9th at 11pm	Complete readings

Assignment 3	**Assignment 3**	**March 24th**	**April 9th at 11pm**	**Complete Assignment 3**
Module 9	Ultimate Symbol of Success or Mirage, Human Spaceflight	April 10th	April 18th at 11pm	Complete readings
Module 10	The Future?	April 19th	April 22nd at 11pm	Complete readings & Respond to "Can space based applications actually improve underdeveloped countries?"
Test 2	**Test**	**April 23rd**	**April 25th at 11pm**	**Complete exam on line**