As of 29 July 2020

THE OHIO STATE UNIVERSITY
JOHN GLENN COLLEGE OF PUBLIC AFFAIRS

Syllabus: US Aerospace Policy and the Global Space Economy

PUBAFRS 3620
M-W 3:55 - 5:15
Mendenhall Laboratory 173
and/or by CarmenZoom at go.osu.edu/horackZoom

Part of the John Glenn College of Public Affairs and Engineering College's
***Science and Engineering in the Public Interest* program**

Fall 2020
Credit hours: 3

INSTRUCTOR:

Dr. John M. Horack
142 Hitchcock Hall, 210V Page Hall
Phone: 256.665.3356 (use SMS first)
Email: horack.1@osu.edu
Office hours: go.osu.edu/horackCalendar

ALL ARE WELCOME IN THIS CLASS.

A Covid 19 Related Note to all:

I am disappointed that we will be managing this class through Zoom, and not in person. The decision to offer this course on-line was mine, and I'm happy to have a separate discussion with you about how I came to this decision. At the core, given our situation regarding the extreme and recent resurgence of Covid-19 cases in the United States, I believe we need to be extremely mindful of the health and well-being of each student, their family, our staff, and instructors. We have lost 150,000 people in the US, roughly 1.5 times the capacity of the OSU football stadium, to put it in familiar terms. This number climbs, at the moment, by nearly 1,000 per day and has been rising since at least early July. We are approaching 4.5 million known cases, and a run-rate of nearly 60,000 new cases per day in the United States. It is far better to be at a remote location, tuned in on a computer, and wishing we were in class, rather than to be in class, fighting serious illness and outbreak, wishing we were all at home on Zoom.

COURSE DESCRIPTION

This course is designed to provide students with a strong level of insight and understanding of the political and economic roles and activities of spaceflight in United States, and its interactions with global economic and policy activities. This course blends a small amount of technical understanding with analyses of space-related endeavors taken by the United States, with a focus on the economic and societal impacts this effort brings forth. These also include the origins of national space activities in the US, its role in development of National security, "soft-power,"

and the development of technology in the US. Students will engage in a substantive amount of reading and research, with lectures, discussions, and written analyses of subject matter and current events in US spaceflight.

DEGREE LEARNING GOALS AND OBJECTIVES

The course contributes to all John Glenn College learning goals and objectives related to foundational knowledge in public affairs; competencies in management, leadership, and policy analysis; and developing an appreciation for multiple perspectives in public affairs. In particular, the course focuses on the following objectives at an intermediate level:

1) Students can recognize and interpret the behaviors and motivations of US and global spaceflight players—individual, group, and organizational—in the context of the global economic and policy landscape.
2) Students can analyze and navigate different behavioral situations which drive the actions of the US government, commercial actors, and other US entities engaged in spaceflight.
3) Students possess/develop skills required to become effective leaders in the public and/or nonprofit sectors.
4) Students have an appreciation for national and organizational differences in perspectives, backgrounds, interest, and needs pertaining to government and commercial spaceflight endeavors.
5) Students develop the capability for independent analysis of stakeholder environments for the purpose of formulating policy, can demonstrate the ability to perform research into the complex environments surrounding a Nation's spaceflight activities, and construct a compelling policy action brief on a relevant subject of their choosing.

CLASSROOM CONDUCT

Advance reading and active participation is critical to the success of this course. As you are studying *the professional activities of global spaceflight actors*, this course will be conducted according to the professional standards of the workplace. The course will begin and end on time. **Mobile devices will be turned off.** Laptop computers, tablets and other devices are only allowed by the permission of the instructor. Students may not record audio or video in class without explicit permission by the instructor.

GUEST LECTURERS:

We may have several practitioners of spaceflight activities, space policy, or related areas of expertise. These may be among the most useful times we have together, as far as investiture in actually internalizing course material, and seeing hard problems from various perspectives, vis-a-vis learning about spaceflight in the United States. I encourage you all to be prepared for these lectures by researching the backgrounds of

those invited, and coming to class with significant questions to ask. Among the most valuable things we can give you in this class, an entree into a professional network may be the most valuable in the long-run, and this is an opportunity to leverage that network for yourself, your learning, and your future.

GRADING AND ASSIGNMENT DETAILS

- In-class participation: 10%
- Online discussion forum: 15%
- Two 'mid-term' papers/practical assignments: 20% (each, approximately at weeks 5 and 10)
- Final examination: written policy brief and an oral presentation critique: 35%

TOTAL: 100%

In-Class Participation - 10%

Students are expected to attend and participate in class - whether by Zoom or in person - as meaningful discussion of topics and case studies hinge on both preparation and participation. Missing class, not being prepared, and not contributing to course discussion or group activities will adversely affect a student's participation grade.* Participation includes not only discussion of course concepts, but also careful listening and respect for others in the classroom. Furthermore, active participation is based on preparation and includes providing good, solid answers to questions. Good answers indicate that you are actively listening to your colleagues and providing comments relative to ongoing discussion. Relevant comments add to the group's understanding of the material, challenge and/or clarify the ideas expressed by others, integrate material from past classes or other courses, and show evidence of analysis rather than mere opinion.

It is good professional practice to advise the instructor <u>prior to class</u> if you are to be absent for any reason.

Note: The instructor reserves the right to reallocate a portion of students' participation grade to <u>unannounced quizzes</u> if it appears that students are not doing the reading before class. Up to 50% of the participation grade may be reallocated to unannounced quizzes.

Online Forum Discussion - 15%

Not all students are equally comfortable sharing "on the fly" in class, may have technical difficulties during any given on-line lecture, and valuable contributions to

---

* Arrangements will be made on a case-by-case basis to accommodate absences due to illness. It is important that everyone stay healthy, so please do not come to class if you are ill and contact me *before class* to make accommodations.

discussions are also found through thought and written communications. Therefore, we will also pursue online discourse in addition to activities in our classroom. Students will be graded for their participation in the online forums. Postings are expected to contain college-level thought and analysis and to maintain OSU's standards for student conduct and online civility. ***Students are required to post weekly, and can be in response to other postings, or original contributions to the discussion***.

Guidance for acceptable posting and response postings:

Topic postings - one per week

- 200-400 words
- Relevant to discussion in class, current events/activities, or other happenings in US and/or global space activities.
- Use complete well-written sentences, in English.
- Stay focused and concise

Forum discussion will be graded on the following criteria:

- Substance – appropriate and effective incorporation of leadership and management concepts
- Argument – ability to communicate clearly and persuasively
- Style – grammar, spelling, structure of postings
- External references and support for positions and arguments

Mid-Term Project/Papers - 20% each (two assignments, total of 40%)

Students will develop two "mid-term" (in quotations because they will not be due concurrent with the middle of the term) project/papers, relevant to topics from the classroom lectures, reading materials, and discussions. There will be a theme or choice of (no more than four) prompts from which to choose as part of the assignment, and the student will develop a well-reasoned discussion and analysis around these prompts and the assignment framework.

The papers will be graded on the following criteria:

- Substance – appropriate treatment of key concepts
- Argument – ability to communicate clearly and persuasively
- Style – grammar, spelling, structure of slides
- Timing – demonstrate capacity to manage limited space appropriately
- Substantiation - evidence from outside class to support positions and arguments made in the paper.

Papers are expected to be ~10 pages in length, double spaced, with one-inch margins on all four sides, using a 12-point business (e.g., Times New Roman, Calibri, or Arial) font. Students will submit papers in PDF format, uploaded through CARMEN or by email attachment.

Final Examination

The final examination will be a comprehensive analysis of a particular topic, subject, or challenge in US spaceflight and will be chosen by the student in conjunction with the instructor. The assignment is to develop a written policy action brief, along with an oral presentation to accompany the written brief. Students may think of this as an exercise to fulfill a spaceflight-policy related statement *"I would like to make the case that (fill in the blank with a space actor or stakeholder) should (fill in the blank with a given action)"*

The written product will provide a balanced analysis of the topic, relevant subject matter, discuss historical events and activities leading to the current situation, and offer a set of prescriptions/policies for the go-forward. It will be coupled with a oral presentation generated from the paper, and given to the class as part of the final four lectures. Ample training and guidance will be given to the students.

The grading criteria will be the same as for the mid-term papers.

Grading scale

93 - 100	A	80 - 82	B-	68 - 69	D+
90 - 92	A-	78 - 79	C+	64 - 67	D
88 - 89	B+	73 - 77	C	63 & below	E
83 - 87	B	70 - 72	C-		

COURSE POLICIES

Assignment Submission:
Assignments are to be submitted using Canvas. Assignments are due no later than 11:59 pm of the due-date assigned, otherwise they are considered late. Assignments should have one-inch margins, double-spaced, and typed in 12-point business-acceptable font (Examples include: Times New Roman, Arial, Calibri, etc.; *unacceptable* fonts include Courier, WingDings, compressed fonts, etc.). All papers will be processed through TurnItIn, a software program designed to assess originality of all writing. Please be mindful of Ohio State University's strong commitment to originality in your scholarship and your academic work. See "Academic Integrity" below.

Late Assignment Policy:
Assignments are due as noted in CARMEN. Students who fail to turn an assignment at the start of class will incur a 5% penalty, and for each day thereafter that it is late (e.g. 94% to 89% to 84%, etc.). I am happy to negotiate with you around specific circumstances that may require a change in submission date - but please let's do this well before the deadline, and not at the last minute.

Academic Integrity:
The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the University's *Code of Student Conduct* and that all students will complete all academic and scholarly assignments with fairness and honesty. Failure to follow the rules and guidelines established in the University's *Code of Student Conduct* may constitute "Academic Misconduct." Sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the University.

In the Ohio State University's *Code of Student Conduct*, Section 3335-23-04 defines academic misconduct as: "Any activity that tends to compromise the academic integrity of the University, or subvert the educational process." Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Ignorance of the University's *Code of Student Conduct* is never considered an "excuse" for academic misconduct.

If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact the instructors.

Accommodation Policy:
The University strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including mental health, chronic or temporary medical conditions), please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with Student Life Disability Services. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. **SLDS contact information:** slds@osu.edu; 614-292-3307; slds.osu.edu; 098 Baker Hall, 113 W. 12th Avenue.

Mental Health Statement:
As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. The Ohio State University offers services to assist you with addressing these and other concerns you may be experiencing. If you or someone you know are suffering from any of the aforementioned conditions, you can learn more about the broad range of confidential mental health services available on campus via the **Office of Student Life Counseling and Consultation Services (CCS) by visiting ccs.osu.edu or calling 614-292- 5766. CCS is located on the 4th Floor of the Younkin Success Center and 4th Floor of the**

PAES Building. 24 hour emergency help is also available through the National 24/7 Prevention Hotline at 1-800-273-TALK or at suicidepreventionlifeline.org

Glenn College Diversity Values Statement:
"The Glenn College is committed to nurturing a diverse and inclusive environment for our students, faculty, staff, and guests that celebrates the fundamental value and dignity of everyone by recognizing differences and supporting individuality. We are dedicated to creating a safe space and promoting civil discourse that acknowledges and embraces diverse perspectives on issues and challenges that affect our community."

FALL 2020 COURSE OUTLINE - Holidays are 7 Sept (Labor Day) and 11 Nov (Veteran's Day).

PLEASE CONSULT THE CARMEN MODULES FOR THE FINE-DETAIL OF EACH LECTURE, AND EXPECTATIONS I HAVE FOR YOU TO COME PREPARED.

Lecture Topic	Lecture Number	Date
Part I: Political and Economic origins of Space Activities		
Course introduction and Overview and the Basics of Spaceflight	1	26 August
Basics of Spaceflight	2	31 August
Oberth, Tsiolkovsky, Goddard, and Peenemünde	3	2 Sept
LABOR DAY HOLIDAY - NO CLASS on MONDAY 07 SEPTEMBER		
Origins of US Space Activities (I)	4	9 Sept
Origins of US Space Activities (II)	5	14 Sept
Fast-Forward: Civil/DoD US Space Posture Today	6	16 Sept
Part II: The Geography of Space Pursuits		
Space Activities in the Soviet Union / Russia	7	21 Sept
European Space Activities (I)	8	23 Sept
European Space Activities (II) - with ESA DG Prof. Dr. Jan Wörner.	9	28 Sept

Lecture Topic	Lecture Number	Date
China as a Space Power (I)	10	30 Sept
China as a Space Power (II)	11	5 Oct
Japan's role in Space Exploration	12	7 Oct
ASEAN Space - Australia, New Zealand, Vietnam	13	12 Oct
Space in India	14	14 Oct
Space in Africa	15	19 Oct
Discussion/Synthesis Session	16	21 Oct
Part III: The Global Political Economy of Space		
Space, the United Nations, and its Sustainability Goals	17	26 Oct
Seeing the Earth from Space, 24/7/365, and at fine resolution.	18	28 Oct
Finding our way around. Geospatial positioning, using space to know precisely where you are.	19	2 Nov
The global challenge of orbital debris (***Prof. Mrinal Kumar Guest Lecture***)	20	4 Nov
The ISS partnership - a business model for the future or firesale?	21	9 Nov
VETERANS DAY HOLIDAY - No Class 11 November 2020		
What is "Commercial Space"?	22	16 Nov
"Boots on the Moon!"	23	18 Nov
Student Oral Defenses (attendance required for all)	**24**	**23 Nov**
Student Oral Defenses (attendance required for all)	**25**	**25 Nov**
Student Oral Defenses (attendance required for all)	**26**	**30 Nov**
Student Oral Defenses (attendance required for all)	**27**	**2 Dec**
Final exam schedule block - the Oral Defenses are the final exam.		

COURSE READINGS

*Readings (will be noted by number in the calendar portion of the syllabus, **IN PROCESS OF BEING UPDATED**)*

1.) NASA Space Act (1958) establishing the National Aeronautics and Space Administration, US Congress (provided)

2.) Societal Impacts of Spaceflight (NASA SP-2007-4801), Dick, S.J., and Launius, R.D., selected readings (provided)

3.) Critical Issues in the History of Spaceflight (NASA SP-2006-4702), Dick, S.J., and Launius, R.D., selected readings (provided)

4.) Spaceflight and the Myth of Presidential Leadership, (Univ. Illinois Press), R. D. Launius, selected readings (provided).

5.) Toward a Theory of Space Power, Lutes, C.D., and Hays, P.L., (Institute for National Strategic Studies, National Defense University), selected readings, (provided)

6.) Columbia Accident Investigation Report, NASA 2003, portions, (provided)

7.) Challenger Accident Investigation Report, NASA 1986, portions, (provided)

8.) Living and Working in Space: a History of Skylab, NASA SP-4208, 1983, portions, (provided)

9.) Defeat, Not Merely Compete: China's View of It's Military Aerospace Goals and Requirements in Relation to the United States, Harold, S.W., Rand Corporation 2018, portions, (provided)

10.) Orders of Magnitude: A history of NACA and NASA 1915 - 1976, Anderson F. W., selected readings, (provided)

11.) Presidential Decisions: NSC Documents, National Security Space Project, George C. Marshall Institute, portions, (provided)

12.) "Letter to Sister Jucunda," Stuhlinger, E., May 1970. (provided)

13.) Selected current and topical space-related readings from Space News, Space Policy On-Line, and other sources, (provided)

14.) Apollo by the Numbers, Orloff, R. W., portions, (provided)

15.) Enchanted Rendezvous: Genesis of the Lunar-Orbit-Rendezvous Concept, Hansen, J., portions, (provided)

16.) On the Shoulders of Titans: History of Project Gemini, Hacker, B.C. and Grimwood, J. M., portions (provided)

17.) The Space Shuttle Decision: America's Search for a reusable spacecraft, Heppenheimer, T.A., portions (provided)

18.) Democracy and Super Technologies: Politics of the Space Shuttle and Space Station Freedom, Kay, W.D., Science, Technology, and Human Values, 1994 (provided)

19.) The Space Station Decision: Incremental Politics and Technological Choice, McCurdy, H.D., portions (provided)

20.) Constellation Program Overview: Connolly, J., NASA/JSC, (provided)

21.) President Barak Obama, Space Policy Speech, April 15, 2010. https://www.nasa.gov/news/media/trans/obama_ksc_trans.html

22.) Commercial Orbital Transportation Services, A New Era in Spaceflight, NASA-SP-2014-617, portions, (provided)

23.) Griffin's Commercial Space Legacy, Foust, J., The Space Review, December 2008 (provided)

24.) The WIRED guide to commercial Spaceflight, January 2019, https://www.wired.com/story/wired-guide-commercial-space-flight/

25.) Cis-Lunar and Gateway Overview, Gerstenmaier, W., 2019, NASA Program Presentation (provided)

26.) Urban Planning for the Moon Village, Foust, J., Space News, December 2018, (provided)

27.) Euronews - How to Build a Base on the Moon, including video, https://www.euronews.com/2016/02/25/how-to-build-a-village-on-the-moon.

28.) Overview of NASA's SERVIR program, https://www.nasa.gov/mission_pages/servir/index.html

29.) 50 years after America's Moon Mission, some of the smallest nations on Earth have joined the Space Race, Washignton Post, 17 July 2019, https://www.washingtonpost.com/world/2019/07/17/years-after-americas-moon-mission-some-smallest-nations-earth-have-joined-space-race/

30.) The Changing Dynamics of Twenty-First Century Space Power, Moltz, J.C., Strategic Studies Quarterly, 2019, (provided)

31.) Science: The Endless Frontier - A report to the President, Bush, V., July 1945 portions, (provided)

Students can access textbook information via the Barnes & Noble bookstore website: www.shopOhioState.com as well as from their BuckeyeLink Student Center. This information is disseminated by B&N to all area bookstores. You may buy from a store of your choice and/or shop for books (always use ISBN# for searches) online.

Students will find readings online posted to the Canvas website for this course. Students are expected to read all of the readings in advance of the session. Students will be assessed on their ability to demonstrate knowledge of the material through their in-class contribution and strategy document assignment. Students are welcome to draw from material in other classes to support course work.