



Space Policy

INTA 4803/8803

3.0 Credits

Fall 2014

Monday, Wednesday, and Friday, 1:05pm – 1:55pm

Ivan Allen College, G-17

Prof. Mariel Borowitz, mariel.borowitz@inta.gatech.edu

318 Habersham, 404-385-1494

Office Hours: Wednesday 11:00am – 1:00pm or by appointment

Course Description:

Space technologies permeate many aspects of our lives, from the GPS applications in our phones to satellite remote sensing that underlies international security verification. We hear about experiments in the International Space Station or see images taken by the Hubble Space Telescope. But how do policy-makers decide what new space missions to fund, where to focus exploration, and what industry developments to encourage or allow?

The answers to these questions require not only examining national policy-making processes, but also the challenges posed by the international nature of space activities. Like the oceans and atmosphere, space is a global commons not owned by any one nation. And as with ocean acidification and climate change, ensuring long-term sustainability of space activities can be very challenging, and requires international cooperation. However, the unique nature of space also poses numerous opportunities for nations to benefit from working together. Orbital mechanics dictates that satellites in orbit around the Earth pass over a variety of nations, which means that the data they collect or the services they provide are relevant to many nations. In many cases, countries can benefit significantly if these systems – meteorological, remote sensing, precision navigation and timing, communications, etc. – can be developed and operated cooperatively, avoiding the need for nations to develop expensive redundant systems. Beyond Earth orbit, all peoples on Earth have an interest in understanding the mysteries of the universe uncovered by space science and exploration. Given the often-high costs of space systems, international cooperation may represent the only way for nations to pursue some space activities.

In this course, we will examine a range of current international space policy issues, including civil, military, and commercial activities. We will look at the origins and evolution of space policy over time and examine its strategic role in international affairs. The course will introduce students to a range of current challenges and debates in space policy, such as current international human exploration strategies, technical and political problems and potential solutions related to space debris, efforts at international cooperation in satellite Earth observations, and recent developments and possibilities in the commercial space launch sector. This course will expose students to the debates and decisions that have shaped global space activities, and the international policy issues that must be addressed to meet future goals.

Course Objectives:

- Student will demonstrate the ability to describe the social, political, and economic forces that influence social behavior.
- Student will demonstrate the ability to describe the social, political, and economic forces that influence the global system
- Students will demonstrate the ability to describe the causal and determinant relationships between science and technology (S&T) and international affairs across different topic areas.
- Students will be able to express their arguments clearly and effectively both in written reports and in their research and oral presentations.
- Students will be able to work in small groups in a way that demonstrates respect for their colleagues and efficiency in working collaboratively towards projects and goals.
- Students will be able to identify a variety of space policy issues and develop arguments for and against particular policy options
- Students will demonstrate the ability to analyze a space policy issue in depth

Course Texts:

Burrows, William E. *This New Ocean: The Story of the First Space Age*. New York: Modern Library, 1999

Weir, Andy. *The Martian: A Novel*. Broadway Books, 2014.

Moltz, James Clay. *Crowded Orbits: Conflict and Cooperation in Space*. Columbia University Press, 2014.

The majority of the readings for this course will be journal articles, government and industry reports, and newspaper articles. These additional readings will be listed on T-Square at least one week in advance of the class for which they should be read, and can be found online through the Georgia Tech library.

Grade Distribution

- 14% Class Participation
- 36% Weekly One-Page Policy Memos
 - 12 Policy Memos worth 3% each
- 25% Midterm Project
 - Group Paper (10%), Individual Paper (10%), Group Presentation (5%)
- 25% Final Paper
 - Main Paper (20%) and Policy Memo (5%)

Assignments

14% Class Participation (not just attendance!)

This course will include discussion on a regular basis, drawing upon the readings and lecture material. The value of these discussions is entirely dependent on the preparation and engagement of the students in the class. To get full credit for class participation, you must, on a consistent basis, attend class, be prepared for discussion, and engage fully with your classmates.

36% Weekly One-Page Written Assignments (12 worth 3% each)

Along with each week's readings, you will receive a policy question to be addressed in a one-page policy memo, due at the start of class on Friday. The policy memo should provide your analysis of the issue based on the readings and lecture for that week. Policy memos are graded on both substance and style. You should demonstrate your understanding of the issue, providing sufficient evidence and explanation to support your answer. Sources (primarily the assigned readings) should be referenced and properly cited. It is also important to answer the question clearly and succinctly, using a logical organization and flow.

You can think of the policy memo as the type of short, formal document you might provide to a supervisor in response to an email inquiry. Despite the fact that it is short (and often produced relatively quickly), it must be clear, concise, and accurate. In some cases you will need to provide some interpretation of the question or explicitly state your assumptions in providing an answer. Style may vary, and you may choose to use headings, subheadings, or even bullet points, in cases where they will be effective. Writing a very good one-page memo can be more difficult than writing a much longer paper. However, this is one of the most important and practical types of writing to master. A number of resources are provided on T-Square to provide advice and suggestions on developing the policy memos.

25% Midterm Project – Due Friday, October 3, 2014 at 1:05pm

Group Paper (10%), Individual Paper (10%), Group Presentation (5%)

The midterm project will be focused on the future of human space exploration, and will consist of three components: a 10-page (2,500-5,000 word) group paper, a group presentation, and a 2-page (500-1,000 word) individual paper from each group member. As part of this assignment, each individual in the class will be assigned a country and a group. You will be required to research your assigned country's human spaceflight policies, looking at past activities, current capabilities, policy statements, future plans, and other relevant information. You should also make use of assigned course readings, lecture materials, and other resources provided.

Groups will be assigned so that each group has a representative of each country. Within your group, you will be required to develop a plan for the future of human space exploration over the next 20 to 25 years. The plan may be fully cooperative (involving all countries in the group), completely independent (consisting of uncoordinated national activities), or somewhere in the middle (collaborative/ synergistic activities, multiple bi-lateral or small group cooperative agreements, etc.). The proposed solution should be realistic, taking into account cost and technical complexity as well as national and international political goals and challenges.

The group paper should outline the proposed human exploration plan, explaining the strategy (destination based, technology based, etc.) and schedule. It should address the strengths and

benefits of the proposal, as well as the potential weaknesses and (to the extent possible) costs. The paper should explain the reasoning behind the proposal: why was this solution chosen, and why do the nations expect it to be successful. (You may also choose to discuss which alternatives were considered and why they were not chosen.) The group presentation should be approximately 15 minutes long, and should include the proposed solution and the rationale behind it (the same information included in the group paper).

Each individual in the group will also write a country position paper (individual paper). In this document, you should explain your nation's role in the proposed future space exploration. You should discuss how the proposed solution benefits your nation, and how it fits in with your nation's human spaceflight objectives (based on past activities, current capabilities, policy statements, state future plans, etc.).

25% Final Paper (20%) and Policy Memo (5%) – Due Friday, December 5, 2014 at 1:05pm

The final paper should be 10 pages (2,500-5,000 words) [Length requirement is doubled for graduate students], written on a space policy issue of your choice. You can choose from the topics that we cover in lecture, but you are not restricted to these topics. The paper should identify the policy issue you have chosen and describe the current state of affairs with regard to the issue, including its relevance to international affairs. It should describe the key policy goals, stakeholders, and technical or political challenges involved. The paper should identify and analyze existing policy proposals and analyze each with regard to the goals and challenges identified. The paper should conclude with concrete policy recommendations.

In addition to the final paper, you should write a 1-page (250-500 word) policy memo summarizing the most important findings from your paper. Assume you are writing the memo to a high-level government official that is not familiar with the specifics of the issue you've chosen. Include relevant background on the issue as well as your recommendations for policy action.

Turning in Written Assignments

All written assignments should be turned in electronically (not printed). Please email the document to mariel.borowitz@inta.gatech.edu. Both the document itself and the email subject should follow the following format:

INTA4803_AssignmentName_YourFirstNameYourLastName

General Guidance for Written Assignments

These are the main questions I'll be asking when grading written assignments:

Did you understand the material presented in lecture and readings?

- Do you bring in sufficient evidence (and sources) to fully answer the question?
- Is your paper accurate? (Do you use the correct evidence, use evidence correctly?)
- Are your sources correctly cited?

Is your paper clear and well-written?

- Do I know what your answer is (bottom line up front!)?
- Is it clear how your sub-arguments/ evidence support your thesis?
 - Not just giving data, but explaining why it's important
 - Not going off on tangents, not including information that isn't relevant
- Does the argument have a logical flow (create an outline!)
- Is the paper free of grammar mistakes or other stylistic issues?

Class Schedule:

Week	Dates	Topic	Assignments
1	Aug. 18, 20, 22	Space Policy Today	
2	Aug. 25, 27, 29	Space Launch Industry	Policy Memo 1 Midterm Project Groups Assigned
3	Sept. 1, 3, 5	Commercial Cargo and Crew <i>No Class Mon., Sept. 1: Labor Day</i>	Policy Memo 2
4	Sept. 8, 10, 12	Human Space Exploration: The Space Race	Policy Memo 3
5	Sept. 15, 17, 19	Human Space Exploration Post-Apollo	Policy Memo 4
6	Sept. 22, 24, 26	Future of Human Space Exploration	Policy Memo 5
7	Sept. 29, Oct. 1, 3	International Astronautical Congress Midterm Project Presentations (Friday)	Midterm Project Due
8	Oct. 6, 8, 10	Space Science	Policy Memo 6
9	Oct. 13, 15, 17	Space Applications <i>No Class Mon., Oct. 13: Fall Break</i>	Policy Memo 7
10	Oct. 20, 22, 24	Communications Satellites	Policy Memo 8
11	Oct. 27, 29, 31	Earth Science Satellites	Policy Memo 9
12	Nov. 3, 5, 7	Position, Navigation, and Timing Satellites	Policy Memo 10
13	Nov. 10, 12, 14	Space Security and Outer Space Treaties	Policy Memo 11
14	Nov. 17, 19, 21	Space Security Today	Policy Memo 12
15	Nov. 24, 26, 28	Future of Space Security <i>No Class Fri. Nov. 28: Thanksgiving</i>	
16	Dec. 1, 3, 5	Presentations and Discussion	Final Paper Due