History of Space Flight
Winter Quarter 2004

James Schombert
Office: 461 Willamette, 6-5214
Office Hours: 9-10am MWF (or check my schedule and drop in during a blank time)
email: js@abyss.uoregon.edu

Course Description:

The history of exploration is a series of examples of humankind breaking physical barriers using new technology. Whether it be the next valley, over the mountain range or across the ocean; it has been the development of the wheel, domestication of animals and the sailing vessel that has allowed the adventurer to explore. The last barrier to our civilization is the gravitational well of our planet that stands between us and outer space. Even Socrates (500 B.C.) was aware of the importance of space flight when he said "Man must rise above the Earth - to the top of the atmosphere and beyond - for only thus will he fully understand the World in which he lives".

This course will be a historical review of the people and technology involved in the exploration of outer space. While normally thought to be a recent enterprise, the history of space flight actually goes back to early rockets developed by Chinese scientists around 1000 B.C. The quest for space continues today with the construction of the International Space Station (ISS), our first permanent habitat in orbit. There will be a strong emphasis in the course to weave the scientific goals in context with the political climate of the times.

Of human endeavors, space flight differs from previous achievements since it deals with an environment which is so extremely hostile to the human body. Because of its perilous nature, the race for space is one of the few examples in human history where the need to explore drove the development of previously unknown technology. One of the objectives of this class will be to trace how our vision of space flight has changed over the years.

Another objective to the course is an examination of the types of people involved in the exploration of space. There are few other enterprises in recent history that involve such diverse personalities as space flight. The NASA mentality, the 'Right Stuff', Apollo 13 disaster, John Glenn's return to space on the Space Shuttle are all examples of how space flight was much more than a simple technological achievement. The effects of space flight were complete unknowns to the human body and there are numerous examples of individual heroism.

Course Organization:

All lectures in this course will be delivered electronically. The lecture pages will be on the Web in HTML (hypertext mark-up language) format so that they are accessible from any computer, either at home or on campus. All students are required to obtain computer accounts on gladstone (or any Internet server of your choice) since all the course material is in Web format. The address for this course is abyss.uoregon.edu/~js/space.

We are using the computer network in this class for several reasons:

- Network literacy is a key college skill. A great deal of research for term papers can be done using the proper search engines.
- Since the course material is always available, there is less of a need to scramble to take notes during class. You can focus on paying attention.
- There is lots of material out there on the Internet which is relevant for this class. If a question occurs to you while studying, the answer is probably out there on the Internet.

Even though the web notes replace the need for extensive blackboard notes, they do not replace your need to attend class. A great deal of material is discussed in lecture that is not in the web notes and will appear on the exams. Plus, difficult concepts in the web lectures will be clarified in class. So please attend.
Use the email system. Often professors only hear from students through office hours, and those students are usually the ones having trouble in the course. When you study or review your notes, send me questions by email. Also email me suggestions and comments about the course, particularly in the first few weeks in order to have an impact during the term.

Grading:

Grading will consist of two essay exams and a 15-page term paper, each 1/3 of your total grade. The first exam will occur midway through the course, the second exam is on the last day of class. Your term paper outline is due Jan 30, the finished paper is due Mar 6.

The essay exams consist of five questions of the "compare and contrast" type of inquiry. Your answers to be accurate and concise. In terms of grading, the following criteria are used:

- Satisfactory work (C): Describe the facts with limited errors.
- Good work (B): A well written answer that brings the facts together in a coherent fashion. Addresses the key points of the question, but may miss the connecting points.
- Excellent work (A): A well written answer that uses facts to clearly address the question and demonstrates comprehensive understanding of the problem.

With respect to the term paper, the grading is divided into three parts: content, style, organization. The content of the paper should contain enough information (and citations) to frame the issue you are addressing. The content should include observations, conclusions, and applications that go beyond mere description. The paper should exhibit logical reasoning and a clear goal. The style of the paper should demonstrate an understanding of the terminology and an engaging approach to the material. The organization of the paper should maintain a clear theme, well-constructed paragraphs and a logical progression to address the goal of the paper.

Here are some possible topics for your term paper:

- moon probes
- x-planes
- goddard
- challenger/columbia
- galileo
- economic benefits
- mining in space
- space stations
- animals in space
- space colonization
- space food
- railguns
- orion project
- space elevator
- missile defense
Textbook:

The textbook for this course is William Burrows 'This New Ocean'. The readings are as follows:

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Academic Honesty:

A recent survey of UOregon upperclassmen has indicated that 91% admit to cheating on a written assignment or exam. Every effort will be made in this class to deter dishonesty through classroom procedures. You are all welcome to work in groups on Homework assignments, however exams must be based on individual work only (i.e. don't look at someone else's exam). It is degrading to impose draconian security measures to enforce honesty. Instead, we will use the honor system in this course and allow each of you to uphold your personal standards of conduct. For those of you who have failed to develop your own ethics, the University has designed the Student Conduct Program.

Accommodations:

If you have a documented disability and anticipate needing accommodations in this course, please see me as soon as possible. And please request that the Counselor for Students with Disabilities (H. Gerdes, hgerdes@oregon) send a letter verifying your disability.
This New Ocean: The History of Space Flight

Administrative:

Syllabus
Schombert's Schedule

Internet Resources:

Solar System Live
Unit Converter

Strobel Web Textbook
Hartmann Web Textbook
Positional Astronomy

21st Century Science
Astronomy/Physics Glossary

astronautix.com
Apollo Program
Cold War Program

Meteor Showers and Comets
Greek Alphabet
Exponents and Logarithms
Temperature Scale

AST121: The Solar System
AST122: Birth and Death of Stars

NSSDC Spacecraft List
Manned Spacecraft
NASA History

Lectures:

1. Jan 11: Early Rocketery
2. Jan 13: Galileo/Newton
3. Jan 18: Goddard/WWII
4. Jan 20: X Projects
5. Jan 23: Orbits/ICBM's
6. Jan 25: Cape Canaveral
7. Jan 27: Sputnik/Vanguard
8. Jan 30: Vostok/Mercury
9. Feb 01: Early Satellites
10. Feb 03: Voshkod/Gemini
11. Feb 06: Planetary Probes
12. Feb 08: Space Tragedy
13. Feb 10: Midterm Exam
14. Feb 12: Space Race
15. Feb 15:样板
16. Feb 13: Saturn V
17. Feb 15: Apollo
18. Feb 17: Space Science
19. Feb 20: Launch Systems/Military Space Forces
20. Feb 22: Mars Missions
21. Feb 24: Outer Planets/Grand Tour
22. Mar 06: Skylab/Salyut
23. Mar 08: Spaceplane
24. Mar 10: Space Shuttle
25. Mar 13: Hubble
26. Mar 15: Space Station
27. Mar 17: FTL
28. Mar 23: Final Exam

We set sail on this new sea because there is new knowledge to be gained, and new rights to be won, and they must be won and used for the
progress of all people. For space science, like nuclear science and all technology, has no conscience of its own. Whether it will become a force for good or ill depends on man, and only if the United States occupies a position of preeminence can we help decide whether this new ocean will be a sea of peace or a new, terrifying theater of war.

John F. Kennedy
September 12, 1962

Copyright Information
# Schombert's Schedule

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