

Space Biology / Space Agriculture

Fall 2008

HOS 4905 section 2768

PCB 6937 section 2579

Format: Lecture and seminar 1 credit
Schedule: Tuesday, period 6 (12:50PM-1:40PM)
Location: Fifield Hall Room 2318
Pre-requisite: none

Course Description:

This general interest course will examine the history of biology experiments in the spaceflight environment, and will discuss the current and future deployment of biology and life detection experiments in extraterrestrial environments, especially the Moon and Mars. The focus will be on experiments involving plants. The course will also involve hands-on examination of spaceflight equipment and data, as well as field trip(s) to Kennedy Space Center, and the course will engage the broader spaceflight community at UF and KSC to fully develop the context of biology and agriculture in space.

Course Objectives:

At the completion of this course, the students are expected to be familiar with the historical timeline of space travel and especially biology experiments conducted in space. In addition, the students are expected to develop an appreciation for the difficulties and demands of spaceflight experiments, as well as the potential for biologically-based life support systems in human extraterrestrial habitats.

Instructors: Dr. Robert Ferl, Dr. Anna-Lisa Paul
Room 2109 Building Fifield Hall
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Office Hours: By appointment

Resources:

There is no required textbook for this course. All reading and preparatory materials will be discussed in class.

Required Reading: none.

Internet Homepage for the Course Linked from <http://www.hos.ufl.edu/ferllab/>

Course Outline:

History of spaceflight - Both manned and unmanned, including the vehicles and payloads that contained biological experiments.

What do we need to know before we go... I - Picnic basket vs sustainable approaches to extraterrestrial life support

What do we need to know before we go... II - Ground studies related to spaceflight agriculture. What are the major limitations to biology and especially agriculture in spaceflight and extraterrestrial environments?

What do we need to know before we go... III - Analog sites, Parabolic flights, specialized chambers and other approaches to simulating extraterrestrial environments.

What do we need to know before we go... IV - Shuttle and ISS payloads in the modern spaceflight era

What do we do when we get there... I – Lunar studies and potentials. What is known about the lunar return samples and biological impacts? How will plants and agricultural ecosystems do on the moon?

What do we do when we get there... II - Martian life searches and the implications for biology and agriculture on Mars.

What do we do when we get there... III – The long range future of biology and agriculture in the deep solar system, such as Europa and the like. What are the limitations and the possibilities?

Broader Implications – What are the limitations to human exploration in the absence of extraterrestrial agriculture? What does space biology and space agriculture contribute to space exploration, to the appreciation of space travel, and to the health and well being of science and society?

Course Evaluation

Grades for the course will be assigned according to established university policy.

90-100 = A; 85-89 = B+; 80-84 = B; 75-79 = C+; 70-74 = C; 65-69 = D+; 60-64 = D.
<59.9 = E.

Attendance & participation	80 points
Student presentation	20 points
TOTAL	100 points

Student Presentation: Students are required to make a 15 minute presentation on an aspect of space biology / space agriculture experiments in the past or potentially in the future. Grading will be based on communication of the main idea of the

presentation, explanation of the biological and spaceflight principles examined, and clarity of delivery of the presentation.

Course Policies and Procedures

Attendance: Attendance at the lectures and active participation in classroom discussions are required (80 points out of 100 total). Two absences will be tolerated, if prior written notification is given to the instructor, but additional or unexcused absences will result in grade reductions.

Mobile Phone Policy: The use of cellular phones, messaging devices and other electronic devices during lectures is prohibited. In class, the students are asked to put the phones and messaging devices on silent mode and turn off other devices.

Academic Honesty, Software Use, UF Counseling Services, Services for Students with Disabilities:

In 1995 the UF student body enacted a new honor code and voluntarily committed itself to the highest standards of honesty and integrity. When students enroll at the university, they commit themselves to the standard drafted and enacted by students.

In adopting this honor code, the students of the University of Florida recognize that academic honesty and integrity are fundamental values of the university community. Students who enroll at the university commit to holding themselves and their peers to the high standard of honor required by the honor code. Any individual who becomes aware of a violation of the honor code is bound by honor to take corrective action. The quality of a University of Florida education is dependent upon community acceptance and enforcement of the honor code.

The Honor Code: We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.

On all work submitted for credit by students at the university, the following pledge is either required or implied: **“On my honor, I have neither given nor received unauthorized aid in doing this assignment.”**

The university requires all members of its community to be honest in all endeavors. A fundamental principle is that the whole process of learning and pursuit of knowledge is diminished by cheating, plagiarism and other acts of academic dishonesty. In addition, every dishonest act in the academic environment affects other students adversely, from the skewing of the grading curve to giving unfair advantage for honors or for professional or graduate school admission. Therefore, the university will take severe action against dishonest students. Similarly, measures will be taken against faculty, staff and administrators who practice dishonest or demeaning behavior.

Students should report any condition that facilitates dishonesty to the instructor, department chair, college dean or Student Honor Court.

(Source: 2007-2008 Undergraduate Catalog)

It is assumed all work will be completed independently unless the assignment is defined as a group project, in writing by the instructor.

This policy will be vigorously upheld at all times in this course.

Software Use:

All faculty, staff and students of the university are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against university policies and rules, disciplinary action will be taken as appropriate.

Campus Helping Resources:

Students experiencing crises or personal problems that interfere with their general well-being are encouraged to utilize the university's counseling resources. Both the Counseling Center and Student Mental Health Services provide confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance. The Counseling Center is located at 301 Peabody Hall (next to Criser Hall). Student Mental Health Services is located on the second floor of the Student Health Care Center in the Infirmary.

- *University Counseling Center*, 301 Peabody Hall, 392-1575, www.counsel.ufl.edu
- *Career Resource Center*, CR-100 JWRU, 392-1602, www.crc.ufl.edu/
- *Student Mental Health Services*, Rm. 245 Student Health Care Center, 392-1171, www.shcc.ufl.edu/smhs/

Alcohol and Substance Abuse Program (ASAP)
Center for Sexual Assault / Abuse Recovery & Education (CARE)
Eating Disorders Program
Employee Assistance Program
Suicide Prevention Program

Students with Disabilities:

The Disability Resource Center coordinates the needed accommodations of students with disabilities. This includes registering disabilities, recommending academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services and mediating faculty-student disability related issues.

0001 Reid Hall, 392-8565, www.dso.ufl.edu/drc/