

 FLORIDA ATLANTIC UNIVERSITY	NEW COURSE PROPOSAL Undergraduate Programs		UUPC Approval _____ UFS Approval _____ SCNS Submittal _____ Confirmed _____ Banner Posted _____ Catalog _____
	Department College <i>(To obtain a course number, contact erudolph@fau.edu)</i>		
Prefix Number	<i>(L = Lab Course; C = Combined Lecture/Lab; add if appropriate)</i> Lab Code	Type of Course	Course Title
Credits <i>(Review Provost Memorandum)</i>	Grading <i>(Select One Option)</i> Regular Pass/Fail Sat/UnSat	Course Description <i>(Syllabus must be attached; Syllabus Checklist recommended; see Guidelines)</i>	
Effective Date <i>(TERM & YEAR)</i>			
Prerequisites, with minimum grade*		Corequisites	Registration Controls <i>(Major, College, Level)</i>
*Default minimum passing grade is D-. Prereqs., Coreqs. & Reg. Controls are enforced for all sections of course			
WAC/Gordon Rule Course Yes No <i>WAC/Gordon Rule criteria must be indicated in syllabus and approval attached to proposal. See WAC Guidelines.</i>		Intellectual Foundations Program (General Education) Requirement <i>(Select One Option)</i> <i>General Education criteria must be indicated in the syllabus and approval attached to the proposal. See GE Guidelines.</i>	
Minimum qualifications to teach course			
Faculty Contact/Email/Phone		List/Attach comments from departments affected by new course	
Approved by			Date
Department Chair <u>Evonne Rezler (via email confirmation)</u>			<u>3-23-20</u>
College Curriculum Chair <u>Jerry Haky (via email confirmation)</u>			<u>3-27-20</u>
College Dean <u>Evonne Rezler (via email confirmation)</u>			<u>3-27-20</u>
UUPC Chair <u>Jerry Haky (via email confirmation)</u>			<u>3-30-20</u>
Undergraduate Studies Dean <u>Edward Pratt (via email confirmation)</u>			<u>3-31-20</u>
UFS President _____			_____
Provost _____			_____

Email this form and syllabus to mjenning@fau.edu seven business days before the UUPC meeting.

Florida Atlantic University
IDS 2155 Fall
“Human Mission to Mars” (3 Credits)
WF 2:00 – 3:20pm, Room PS 109

Syllabus

Instructors:

Anthony Abbate (HE-33, Room 1007C; office hours: MW 11:00-Noon; 954-762-5295; AABBATE@fau.edu)
Ann Branamann (CU-97, Room 253; office hours: WF 12:00-1:30pm; 297-0261; BRANAMAN@fau.edu)
Nwadiuto Esiobu (SC-1, Room 271; office hours: WF 12:30-1:30pm; 297-4603; NESIOBU@fau.edu)
Andy Khamoui (FH-11A, Room 128-B; office hours: TR 1:30-3:30pm; cell: 808-754-1097; AKHAMOUI@fau.edu)
Salvatore Lepore (SE-43, Room 136; office hours: TW 4:00 – 5:00 PM; 297-0330; SLEPORE@fau.edu)
Dan Meeroff (EW-36, Room 206, office hours: WR 11:30-12:30pm, 297-2658, dmeeroff@fau.edu)
Tara Root (Boca: SE-43, Room 452, Davie: DW, Room 329; office hours: Boca- T 10:00 – 11:30, Davie – M 10:00 – 11:30; 297-3253; TROOT@fau.edu)
Ata Sarajedini (SE-43, Room 256; office hours: TR 12:30-1:30pm; 297-3301; ATA@fau.edu)
Robin Vallacher (BS-12, Room 229; office hours: TBD, 297-3371; VALLACHER@fau.edu)
Luc Wille (SE-43, Room 108; office hours: TR 12:30-1:30pm; 297-3380; WILLEL@fau.edu)
Xing-Hai Zhang (SC-1, Room 262; office hours: TR 12:30-1:30pm; 297-1011; XHZHANG@fau.edu)

Course Description: This course is designed to explore the challenges and opportunities offered by the planned human missions to Mars. Covering topics such as human space travel to the red planet, the impact of spaceflight on the human body, the effects of long-term spaceflight on human consciousness, human relationships, and groups of humans, the key components of building and functioning a Martian habitation module, growing food on Mars, and the ethical and political issues related to a human mission to Mars. To address problems and challenges associated with these topics, the students will explore the process of scientific inquiry and creativity applying the scientific method to propose solutions to problems in these various areas all the while embracing the uncertainty associated with the critical evaluation of these problems and challenges.

Course Prerequisites: None

Textbooks: “The Case For Mars” by Robert Zubrin (required, provided free for all registered students)
“The Martian” by Andy Weir (optional)
Additional required reading and multi-media materials will be made available on Canvas

Teaching and Learning Assistants: There is one Teaching Assistant for the course (**Kevin Cresswell**, SE-43, Room 485, office hours: M 5:00-8:00pm, R 2:00-5:00pm; 302-293-0523; KCRESSWELL2014@fau.edu,) and three Learning Assistants (Dahira Espinoza, 561-945-1205, espinozad2015@fau.edu; Hadi Gorak, 561-846-9075, hmohamma@fau.edu, Nick Minio, 908-583-4777, nminio2016@fau.edu)

Student Learning Outcomes:

- a. Explore the challenges and opportunities offered by the planned human missions to Mars.
- b. Explore the process of scientific inquiry and creativity (including failures) to address a problem or challenge.
- c. Apply the scientific method to embrace uncertainty associated with the critical evaluation of a problem or challenge.

- d. Develop hypothesis-driven solutions integrating multiple disciplines.
- e. Communicate scientific outcomes through team work and community building.

Intellectual Foundations (General Education) Program Outcomes

This course partially fulfills the course requirements for the Science and the Natural World IFP Foundation area in the FAU general education program. Scientific principles are behind what we find in nature and in natural occurrences. Scientific issues, such as those dealing with stem-cell research, cloning, and global warming, are hotly debated by policy makers. Courses that meet this requirement share the goal of seeking to understand patterns and principles behind phenomena and occurrences, both in the inorganic world and in the living world.

Students who satisfy the Science and the Natural World requirement will be able to:

- a. Explain important scientific concepts, principles and paradigms.
- b. Explain how principles of scientific inquiry and ethical standards are used to develop and investigate research questions.
- c. Explain the limits of scientific knowledge and of how scientific knowledge changes.
- d. Critically evaluate scientific claims, arguments and methodology.

Course Web Page: All materials will be placed on Canvas.

General Structure and Student Assessment: Each student will be assigned to a small group, the members of which will work collaboratively on problems/projects assigned to be done in class or out of class. Each project must be led by one member of the group who then coordinates the activities of the other members in order to ensure an efficient and systematic solution to the problem being posed. Please select a different group member to lead each project so that, by the end of the semester, everyone has had a chance to serve in the role of project leader at least once.

Grades for this course will be based on a combination of quizzes, short papers, a poster presentation in a science symposium format, and class attendance. Each of the modules will have an in-class quiz that assesses the student's comprehension of the material specific to that module. There will be 8 in-class quiz grades in total. Each student will also be expected to hand-in three short papers each describing the results of one of the assigned group projects. **These papers will be due by the beginning of class on September 30 (after modules 1 through 3 have been completed) , October 25 (after modules 4 through 5 have been completed), and November 27 (after modules 6 through 8 have been completed).** The detailed instructions for these papers are in a separate document. The "final exam" of the course will be a research symposium wherein each group of students will present a poster paper on a topic of their choosing from the course material discussed during the semester. The topics and a brief description of each group's project will need to be approved by the instructors by November 27. Lastly, a small fraction of each student's grade will be based on their attendance in class.

Grading Breakdown: 35% - Quiz grades
40% - Three short papers on the assigned projects
20% - One poster presentation per group at the course symposium (as the Final Exam)
5% - Attendance

Grading Scale:

A	>93%
A-	90-93%

B+	87-89%
B	83-86%
B-	80-82%
C+	77-79%
C	73-76%
C-	70-72%
D+	67-69%
D	63-66%
D-	60-62%
E	0-59%

Late Assignment Policy: 10% off for every day that the assignment is late or at the discretion of the instructor.

(see <http://www.fau.edu/academic/registrar/FAUcatalog/academics.php> for more information)

Attendance Policy: Students are expected to attend all of the scheduled classes and to satisfy all academic objectives as outlined by the instructor. The effect of absences upon grades is determined by the instructor, and the University reserves the right to deal at any time with individual cases of non-attendance. Students are responsible for arranging to make up work missed because of legitimate class absence, such as illness, family emergencies, military obligation, court-imposed legal obligations or participation in University-approved activities. Examples of University-approved reasons for absences include participating on an athletic or scholastic team, musical and theatrical performances and debate activities. It is the student's responsibility to give the instructor notice prior to any anticipated absences and within a reasonable amount of time after an unanticipated absence, ordinarily by the next scheduled class meeting. Instructors must allow each student who is absent for a University-approved reason the opportunity to make up work missed without any reduction in the student's final course grade as a direct result of such absence.

Disability Policy Statement: In compliance with the Americans with Disabilities Act (ADA), students who require reasonable accommodations due to a disability to properly execute coursework must register with Student Accessibility Services (SAS) and follow all SAS procedures. SAS has offices across three of FAU's campuses – Boca Raton, Davie, and Jupiter, however, disability services are available for students on all campuses.

Code of Academic Integrity Policy Statement: Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty is considered a serious breach of these ethical standards, because it interferes with the university mission to provide a high-quality education in which no student enjoys an unfair advantage over any other. Academic dishonesty is also destructive of the university community, which is grounded in a system of mutual trust and places high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. For more information, see University Regulation 4.001.

Counseling and Psychological Services (CAPS) Center: Life as a university student can be challenging physically, mentally and emotionally. Students who find stress negatively affecting their ability to achieve academic or personal goals may wish to consider utilizing FAU's Counseling and Psychological Services (CAPS) Center. CAPS provides FAU students with a range of services – individual counseling, support meetings, and psychiatric services, to name a few – offered to help improve and maintain emotional well-being. For more information, go to <http://www.fau.edu/counseling/>

Special Presentations:

November 8: William Heidtman, Engineer at the Kennedy Space Center will speak on NASA's plans for Mars exploration.

November 13: Dr. James Rice, Scientist at the Planetary Science Institute will speak on NASA's plans for Mars exploration.

November 15: Dr. Robert Zubrin, author of the required textbook for the course "The Case for Mars," will be visiting campus and engaging the students in a discussion of his book. He will also deliver a popular-level talk to the general public. Students are invited but not required to attend this talk as well.

Proposed Schedule of Modules: As the semester progresses and depending upon class interest, it may become necessary to deviate slightly from this plan.

Module	Week(s)	Topic
1	1 (Sarajedini) Aug 21, 23	Why Mars? Why colonize? Why is the multidisciplinary approach being taught in this course so important? What are the student learning outcomes and why are they important? Brief history of Mars exploration from the ground and in space.
2	2-3 (Lepore & Wille) Aug 28, Sep 6, 11, 13	Introduce the "Mars Direct" argument and the general strategy for a sustainable Mars mission, including issues such as propulsion, and using Martian resources to sustain life as well as to create fuel for the return trip.
3	4-5 (Khamoui & Esiobu) Sep 18, 20, 25, 27	Effects of extended spaceflight on the human body covering topics such as land-based modeling of spaceflight, NASA exercise countermeasures program, and engineering the gut microbiomes of astronauts.
4	6-7 (Vallacher) Oct 2, 4, 9, 11	Effects of long-term spaceflight on human consciousness and on human relationships and groups of humans.
5	8-9 (Abbate & Meeroff) Oct 16, 18, 23, 25	Key components of building and functioning a Martian colony – building materials, design, functionality, atmospheric control.
6	10-11 (Zhang & Root) Oct 30, Nov 1, 6, 20	Growing food on Mars within the atmosphere-controlled colony and how to harness the water required to do so.
7	13 (Branaman) Nov 22, 27	Ethical and political issues related to a human mission to Mars
8	14 (Sarajedini) Dec 4	Wrap-up, conclusions, work on poster presentations
	15 (Students) Dec 10	Final Exam (Poster presentations at Mars Symposium)