

EVDA 782 Senior ResearchStudio in Architecture
RED: A NEW BEGINNING
Winter 2017
(Mon), Tue, (Wed), and Fri, 14:00-18:00 hrs.
Jessie Andjelic
jessie@spectacle-bureau.com

RED: A New Beginning

Throughout the course of history, Mars has been a blank slate upon which people have projected their fantasies, fears and desires.

-Patrick J. Kiger, Mars in the Popular
Imagination

Mars...is the planet that will give us the answer to the critical test of whether humanity can break out of the planet of our birth and become a space-faring species.

-Robert Zubrin, The Mars Society, Mars
Underground

Introduction

A research design studio aimed at designing innovative habitats and settlements for humans on Mars, while critically examining the Mars project and speculating on the identity of human civilization on a second planet.

Background

Mars has often been the subject of mythical projection; it has been depicted as the Angry Planet, the Red Planet, the Planet of War, and etcetera. Around the same time we landed on the moon, Mars, as both a feared and revered planet, became a popular topic in media, science-fiction and literature.

A human mission to Mars represents an unprecedented opportunity to open a new chapter for humanity. Even before the space age began, many dreamt of the day that humans would set foot on Mars and extend our reach beyond Earth. Inspiring generations of scientists, engineers, astronauts, politicians and etcetera, the settlement of a new planet is a goal that optimistically embraces the future and celebrates humanity.

At the same time, the fate of human civilization on Earth is becoming increasingly precarious. Climate change, political instability, devastating illness, extreme poverty, potential collision with an asteroid, military war, and etcetera, threaten human existence. These risks have historically come mostly from nature, however they are now increasingly originating from humanity. The potential for increased systemic resiliency, and for a new beginning, offer an important chance for renewal.

Course Offering

While team members that focus on the engineering and problem solving aspects of the mission will be critical to its success, this studio posits that architects have value as provocateurs, bridging across boundaries and disparate fields of expertise. Spatial designers are the ones who will think to

ask questions such as 'what does it mean to settle a new planet,' and 'what forms will humanity's settlement of the red planet take?'

This studio will focus on developing a cultural and aesthetic identity for the human occupation of Mars and will include the design of innovative habitats and settlements. What kind of culture will be built on Mars and how will it be supported through architecture? Research will include technical requirements, site analysis, historic forms of pioneering and colonizing architecture, identity creation, aesthetics, formal hybridization, and symbolism.

In collaboration with the Harvard Business Aerospace Alumni Association, this course will provide students with exposure to expertise on space travel and exploration, including innovative technologies that are shaping aerospace voyages.

OBJECTIVES

1. To develop an understanding of the challenges and opportunities of designing habitats on the planet Mars.
2. To create a conceptual and aesthetic identity for human settlements on Mars at multiple scales.
3. To develop an understanding of space and interplanetary innovation and technology as they apply to architecture.
4. To develop and refine conceptual, theoretical, critical and representational skills in architecture.

Teaching Approach

This studio argues that an approach to the Mars project that simply solves technical requirements is not sufficient and posits that our role as Architects is to generate proposed identities for human habitations. Projects developed for Mars thus far in the architectural field focus heavily on technical execution, but few are exploring what it means to inhabit Mars.

This course will give students the opportunity to become familiar with the unique conditions on Mars, including site conditions and technical requirements, while also focusing on formal precedent and identity creation, in the search for a Mars identity. An iterative design process will be encouraged throughout the semester.

The first research / design project will include site and technical analysis, the development of formal design identities, and the design of a small scale intervention projected for the year 2030.

In the second research / design project students will individually design a larger habitat (research station) which will include infrastructure. A program brief will be provided, while students will have the freedom to adjust based on their conceptual approach.

Over the duration of the studio several guest speakers will complement the course content. These lectures are anticipated to add additional layers of complexity and information that students can use to develop and improve the rigor, completeness and clarity of their projects.

- Dr. Robert Thirsk | Chancellor, University of Calgary | Former Canadian Astronaut
- Bryan Versteeg | Conceptual Designer and Artist, Deep Space Industries
- Maher Ezzeddine | President, Harvard Business School Aerospace Alumni Group
- Kriss Kennedy | Space Architect, NASA
- Dr. Raffi Tchakerian | Industrial Designer and Instructor, American University of Beirut
- Dr. Manoug Manougian | Director, STEM Education Center, University of South Florida

Content: Topic Areas & Detailed Class Schedule

Phase 1: RESEARCH (2 weeks, Jan 9 – 24)

- Site analysis
- Design considerations for the inhabitation of Mars (ie. water, atmosphere, gravity, radiation, transportation including rockets, etc.)
- Theory / cultural research

Phase 2: MACHINE (4 weeks, Jan 24 – Feb 17)

- Formal hybridization
- Design of a Machine for the year 2030

Phase 3: ESTABLISHMENT (4 weeks, Feb 17 – March 21, Mid term break Feb 20-24)

- Research Station design including infrastructure, proposed for the year 2050
- Concept, narrative, siting, massing and program development
- Interior articulation, logistics and tectonic studies

Phase 4: SYNTHESIZED DESIGN (3.5 weeks, March 21 – April 18,19,20)

- Coordination and development of work throughout term into a comprehensive final presentation

Phase 5: PORTFOLIO (due April 25)

Schedule of Reviews

Jan 24 – Interim Review

Feb 17 – Interim Review

March 21 - Interim Review

April 18, 19, 20 – Final Review

Means of Evaluation

Students will be expected to follow all assignments, to be present in studio on Tuesdays and Fridays (and as otherwise required by the schedule), and attend all lectures and reviews. Students will also be expected to read any assigned readings. The following is the general breakdown of assignments:

Phase 1: RESEARCH	15%
Phase 2: MACHINE	20%
Phase 3: ESTABLISHMENT	25%
Phase 4: SYNTHESIZED DESIGN	30%
Phase 5: PORTFOLIO	10%

Projects will be evaluated based on an evaluation of the student's professionalism (timeliness, participation, preparedness), craft (quality of presentation execution and content, including progress and process content), conceptual development (iterative project progress, conceptual ambitiousness and clarity), completeness (meeting project deliverables, at a minimum), and design outcomes (overall success at the end of each stage). The focus will be placed on architectural schemes that are deemed to be well developed from conceptual and theoretical perspectives and based on the development of a trajectory or manifesto by the student. If a student receives a grade less than B- for any assignment worth 30% or more, the student will receive an F grade for the course.

Final grades will be reported as letter grades, with the final grade calculated according to the 4-point range.

Grade	Grade Point Value	4-Point Range	Percent	Description
A+	4.00	4.00	95-100	Outstanding - evaluated by instructor
A	4.00	3.85-4.00	90-94.99	Excellent - superior performance showing comprehensive understanding of the subject matter
A-	3.70	3.50-3.84	85-89.99	Very good performance
B+	3.30	3.15-3.49	80-84.99	Good performance
B	3.00	2.85-3.14	75-79.99	Satisfactory performance
B-	2.70	2.50-2.84	70-74.99	Minimum pass for students in the Faculty of Graduate Studies
C+	2.30	2.15-2.49	65-69.99	All final grades below B- are indicative of failure at the graduate level and cannot be counted toward Faculty of Graduate Studies course requirements.
C	2.00	1.85-2.14	60-64.99	
C-	1.70	1.50-1.84	55-59.99	
D+	1.30	1.15-1.49	50-54.99	
D	1.00	0.50-1.14	45-49.99	
F	0.00	0-0.49	0-44.99	

Notes:

- A student who receives a "C+" or lower in any one course will be required to withdraw regardless of their grade point average (GPA) unless the program recommends otherwise. If the program permits the student to retake a failed course, the second grade will replace the initial grade in the calculation of the GPA, and both grades will appear on the transcript.

READINGS

Refer to detailed project handouts.

SPECIAL BUDGETARY REQUIREMENTS

The University has approved supplemental fees for the following courses:

2016/2017 SUPPLEMENTARY COURSE FEES

EVDA 782 - Senior Arch. Studio (all sections)	\$100.00
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CACB Student Performance Criteria

The following CACB Student Performance Criteria will be covered in this course:

Primary Level: B1: Design Skills
Secondary Level: A3: Graphic Skills

Notes:

1. Written work, term assignments and other course related work may only be submitted by e-mail if prior permission to do so has been obtained from the course instructor. Submissions must come from an official University of Calgary (ucalgary) email account.
2. Academic Accommodations. Students who require an accommodation in relation to their coursework or to fulfil requirements for a graduate degree, based on a protected ground other than disability, should communicate this need, preferably in writing, to their Instructor or the designated contact person in EVDS, Jennifer Taillefer (jtaillef@ucalgary.ca). Students who require an accommodation unrelated to their coursework or the requirements for a graduate degree, based on a protected ground other than disability, should communicate this need, preferably in writing, to the Vice-Provost (Student Experience). For additional information on support services and accommodations for students with disabilities, visit www.ucalgary.ca/access/
3. Plagiarism - Plagiarism involves submitting or presenting work in a course as if it were the student's own work done expressly for that particular course when, in fact, it is not. Most commonly plagiarism exists when:(a) the work submitted or presented was done, in whole or in part, by an individual other than the one submitting or presenting the work (this includes having another impersonate the student or otherwise substituting the work of another for one's own in an examination or test),(b) parts of the work are taken from another source without reference to the original author,(c) the whole work (e.g., an essay) is copied from another source, and/or,(d) a student submits or presents work in one course which has also been submitted in another course(although it may be completely original with that student) without the knowledge of or prior agreement of the instructor involved. While it is recognized that scholarly work often involves reference to the ideas, data and conclusions of other scholars, intellectual honesty requires that such references be explicitly and clearly noted. Plagiarism is an extremely serious academic offence. It is recognized that clause (d) does not prevent a graduate student incorporating work previously done by him or her in a thesis. Any suspicion of plagiarism will be reported to the Dean, and dealt with as per the regulations in the University of Calgary Graduate Calendar.
4. Information regarding the Freedom of Information and Protection of Privacy Act (<http://www.ucalgary.ca/secretariat/privacy>) and how this impacts the receipt and delivery of course material
5. Emergency Evacuation/Assembly Points (<http://www.ucalgary.ca/emergencyplan/assemblypoints>)
6. Safewalk information (<http://www.ucalgary.ca/security/safewalk>)
7. Contact Info for: Student Union (<https://www.su.ucalgary.ca/contact/>); Graduate Student representative(<http://www.ucalgary.ca/gsa/>) and Student Ombudsman's Office (<http://www.ucalgary.ca/ombuds/>).