Western Science

1. Course Information

Course Information
Planetary Surface Processes Field School SPACE 9009

List of Prerequisites
SPACE 9001
SPACE 9002
SPACE 9003

Instructor Information

Dr. Gordon Osinski
Professor- Earth Sciences- Western University

Course Syllabus, Schedule, Delivery Mode

The principal objective of this course is to provide participants with an interdisciplinary field studies experience with an emphasis on planetary surface processes. This course will introduce students from a wide range of backgrounds to processes that shape the surface of the Earth and other terrestrial planets. Emphasis will be placed on volcanism, impact cratering, tectonics, and fluvial and aeolian erosion.

Students will learn the following skills:

1. the synthesis, understanding and presentation of "state of the art" knowledge on planetary surface processes

2. an ability to draw together information from a wide variety of subject areas in planetary sciences to address issues relevant to the discipline

3. field training in the recognition and mapping of various rock types and of the relationships between them

One of the major areas of research in Earth and planetary science is in the acquisition and compilation of data from spacecraft in orbit around a particular planetary body and the subsequent interpretation of these images in a geological context. On Earth, this technique is typically called Remote Predictive Mapping (RPM) and is commonly used in regions of the world that are large, difficult to access and under-explored (e.g., Canadian Arctic). The “predictive maps” can be used to guide geologists during

fieldwork, which is obviously not currently possible in planetary science. During this course, students will generate a map of a field area that will be submitted prior to the field section of this course. The site will then be visited in order to provide students with the important ground-truth data that invariably is lacking in planetary science studies.

At the end of the course, students will be able to:

1. assimilate information and data from a wide range of planetary science disciplines (astronomy, geochemistry, geography, geology, geophysics, and physics

2. understand how complex problems in planetary sciences are tackled by scientists and determine the present flaws in our understandings

3. prepare field guides on relevant topics

4. generate simple interpretive geological maps of planetary bodies

Course Format:
The main focus of the course will be a 13-day residential field experience examining various localities in northern Arizona (AZ) and southern Utah (UT), to take place in May 2021. This region of the Midwestern United States is a world-renowned environment for comparative planetology. Field stops will focus on meteorite impact cratering (e.g., Meteor Crater, AZ; Upheaval Dome crater, UT), volcanism (e.g., Sunset Crater volcanic field, AZ), and canyon and valley formation (e.g., Canyonlands National Park, UT). Many of the locations to be visited are considered world-class terrestrial analogues for the Moon and Mars.