

INCREASING STUDENT ENGAGEMENT ONLINE WITH VIRTUAL FIELD AND LAB EXPERIENCES

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COURSE DESIGN



This undergraduate-level course has dual learning goals: (1) to gain knowledge of the physical and chemical processes dealing with systems where rocks and minerals interact with the hydrosphere, atmosphere, biosphere and human activity associated with exploitation and utilization of Earth's resources; (2) to develop research skills in data collection from environmentally damaged areas, analytical measurements of mineral particles with the aid of microscopic and spectroscopic techniques for evaluation of adverse effects of hazardous Earth materials and their concentrations in air, water and food for the safe consumption and public health.

VIRTUAL LABORATORY



The virtual laboratory focuses on optical microscopy and guides students through the process to identify minerals in the samples collected from the field in the virtual field trip.

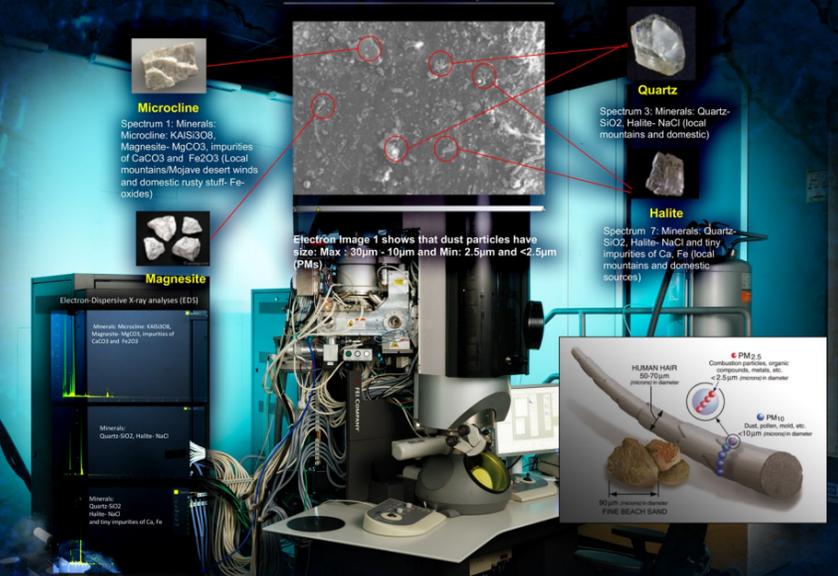
VIRTUAL FIELD TRIP



More than 40,000 abandoned mines left a toxic legacy in California since the Gold Rush of 1849. In the past both mining and mineral processing did not have today's environmental standards. During the historical mining activities millions of tons of waste rock and mill tailings were discharged to the land and waters of California. Over time toxic substances such as arsenic, mercury, lead and others were released into the land through natural processes, continuing to be hazardous for humans and the environment. Our task was to visit the abandoned War Eagle Mine in Tecopa, CA and show you step by step how rocks and minerals are collected in the field, and later are brought to laboratories to determine if they are potentially hazardous.

DAY 2: SHOSHONE, CA

HOME PROJECT



Students worked in teams to collect dust samples from their local environment. The samples were delivered to the UCR lab for analysis with a scanning electron microscope and the results were distributed to the students. The students then interpreted the results and prepared group presentations to disseminate the data.

STUDENT FEEDBACK



Thanks to all involved in the production of this course including: Larissa Dobrzhinetskaya, Bethany Ewers-Felix, Brian Bales, Chantal Elyong, Harley Grow-Hernandez, Jaron Land, Paul "The Voice" Gibson, David Oglesby, Charles Alpers and Nate Wildes

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