GEOLSCI 105/291 - Introduction to Field Methods
3 credits (grade) late Summer

GEOLSCI 105/291 offered this summer September 5-19, 2023
SIGN UP by email or in person with elmiller@stanford.edu
The class will be listed THIS SPRING AND NEXT FALL QUARTER; GRADES WILL BE GIVEN ONLY IN FALL QUARTER 2023, after class is completed!

GEOLSCI 105/291 - Introduction to Field Methods

GENERAL LOGISTICS

- GeolSci 105 is taught as a 2-week course at the “Poleta Folds”
- No pre-requisites are required - People with all experience levels can succeed! – you will not be bored!!
- Transportation and food are provided.
- We tent camp in an established group campground at Westgard Pass in the White-Inyo Mts. of eastern California. An office tent is equipped to facilitate evening office work.
- Each day in the field is ca. 8 hours (approx. 6:30 AM to 2:30 PM) to avoid peak heat. Field area 2x3 km and elevations 5500-7000’

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LEARNING GOALS * *(* for more detail see next pages)*

- In the Poleta Folds region, you will be introduced to a readily recognizable and reasonably well-exposed sequence of mappable stratigraphic units comprised of Cambrian shallow marine carbonates, shale, and sandstones intruded by Jurassic igneous rocks.
- Using this stratigraphy, you will learn how to interrogate earth history by making a geologic map while also collecting data on the 3-D orientation of map units
- The rocks are folded and faulted in a myriad of ways that will interest those with beginning to advanced geologic mapping skills.
- A completed field map, stratigraphic column, structural cross section, and explanatory report on the history of the map area (3-4 pages), prepared in the field, is required to pass the course and get your grade.

OUR TEACHING GOALS OF THIS TWO-WEEK CLASS ARE:

1. To teach you the basic steps involved in collecting and recording a wide variety of data in the field and the various steps involved in producing a geologic map and constructing geological cross-sections from this data. More specialized techniques will be introduced during the course of the project.

2. To give you the beginning knowledge and confidence needed to conduct basic investigations and sampling in the field.

3. To use field-based data to critically evaluate ideas and interpretations proposed by previous workers regarding the geomorphologic, stratigraphic, structural, metamorphic, and intrusive relationships in the regions under consideration.

We will generate geologic maps at 1:6,000 scale. Topographic maps and a wide variety of imagery will be used as a base for these studies. Data collected during the day will be compiled each evening to produce individual geologic maps, cross-sections, map legends and concise geologic histories or summaries of the data.

This field-based research may also serve as a platform and starting point for more detailed laboratory-based studies in our many analytical facilities. ***We welcome continued student participation in these and other later projects.***

Undergrads sign up for GEOLSCI 105, graduate students for 291.

LEARNING HOW TO MAKE A GEOLOGIC MAP IS AN IMPORTANT SKILL IN THE GEOSCIENCES/GEOTECH WORLD

"Geologic maps are amongst the basic tools used by anyone who wants to gain an understanding of the surface and shallow subsurface of the earth. They provide information about the types of materials that are present and the configuration of those materials in three dimensions. In addition, geologic maps identify the location of faults and rock structure. Some maps show the distribution of surficial materials; some depict only bedrock; commonly, both are represented. In the hands of a skilled interpreter, geologic maps reveal the location of many types of natural hazards, indicate the suitability of the land surface for various uses, reveal problems that may be encountered in excavation, and provide clues to the natural processes that have shaped an area and to the potential location of important natural resources. For these reasons, civil and environmental engineers, planners, soil scientists, and geographers, as well as geologists, use geologic maps." *E.W. Spencer, 1993, Geologic Maps, a Practical Guide to the Interpretation and Preparation of Geologic Maps, MacMillan, N.Y.*

Contact elmiller@stanford.edu
for further details and information