Earth Sciences 3350Y: Advanced Field Mapping Techniques
(May 1 to 11, 2015**)**

Instructor: Dr. Dazhi Jiang

Course Description

A two-week field school in a deformed metamorphic area. Emphasis will be on mapping techniques at large scales (from individual outcrops to macroscopic scales). The students will learn how to identify, measure, and document geological features at the outcrop scale and to make connections between outcrops. They are required to understand the structure of their map area in three-dimensions and to establish a geological history of their map area.

Pre-requisite(s): Earth Sciences 2201 and 2250y, any two of Earth Sciences 3313a/b, 3314a/b and 3315a/b.
Field course in May, 0.5 courses.

Course activities: *The stages of geological fieldwork*

1. Preparation for fieldwork (**before departure**)
    - Equipment for living and field work (for details, see the Logistics)
    - Base maps and/or aerial photos for mapping of suitable material, format, and scale
    - Sign appropriate forms

2. Introduction to the field area and mapping skills (large group activity, 3 field days)

- Visit selected areas to view the general geology and to learn field observation, documentation, and mapping skills
- Mapping exercise on a mesoscopic scale

3. Mapping and field notes (5 days)

    Fieldwork consists of moving from one rock exposure to another, finding out what the rocks are, what they show, and where the contacts between mappable units are.

    Recording the field observation is a mixture of the following:
    - Mapping on the base map, and/or aerial photo
    - Describing, sketching, and photographing details of rocks
    - Describing, sketching, and photographing details of contacts, structures

    A checklist for mapping in your area:

    1) Description of all rock units shown in your map area including sketches
    2) Description of contacts, faults, folds, foliations, and lineations including sketches. Note you may have more than one generation of foliations and lineations.

3) Enough measurements (both number and distribution over the area) of each generation of structural elements for equal-area projection analysis
4) Is your map area completely covered? Are field stations reasonably distributed in the map area?

4. Writing up the final report (1 day)

Final Report Layout:

1) Introductory statements:

The area studied (geographically and geologically) and its boundaries.
Who did the work and when.
Base or aerial photo used, the scale
A brief statement of the geographic layout of the outcrops of different map units, their relationship to topography, degree of exposure, and general weathering condition (field sketches may be included)

2) Description of rock units

Give a description of main rock types in each unit present in the map including mineral composition, texture, and primary structures. State the reasons for deciding on such units.

3) Structures

How many generations of structures? How this is established by overprinting relationship? Describe these structures, generation by generation, type by type, of the map area. Present the data by equal-area projection diagrams, field sketches, photos, and cross sections

4) Geometrical patterns and geological history

Based on your mapping as well as that of your neighbors, place the observed generations of structures in sequence and establish a temporal sequence for likely processes that have produced the structures

<u>The report must be accompanied by a fair copy of map and related cross sections and equal-area projections.</u>

Marks

Field Conduct:	10%
Field Participation and Exercises:	20%
Field Notes:	25%
Final Report	45%

Accessibility Statement

Please contact the course instructor if you require material in an alternate format or if you require any other arrangements to make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 661-2111 x 82147 for any specific question regarding an accommodation.