

# Study Guide for Fall 2013 ENVI 110 Lab

## Final Exam Date: Dec 13 2013

### 1. Structure topics

- Solve map view and cross-section view geological units that may be deformed or not.
- Understand and use the symbols that express the attitude of deformed (tilted, folded or faulted beds).
- Know strike and dip, both rigorous definitions and how to measure and plot the measurements.
- Terms and Concepts to understand:
  - Formation
  - Outcrop
  - 6 Principles to determine Relative Age relationships
  - Strike and Dip
  - Contact
  - Anticline and Syncline
  - Fold Axis
  - Fold Limbs
  - Plunge
  - Plunge direction
  - Dip-slip versus strike slip
  - Hanging wall and footwall
  - Normal versus reverse fault
  - Detachment versus thrust fault
  - Right-lateral versus left-lateral strike slip faults
  - Attitudes of faults as well as beds
  - Slickensides
  - Twelve Rules of Structure

### 2. Geological Map skills (Assumed skills on topo maps)

- Recognize large-scale features (folds and faults) as well as smaller details on geologic map
- Understand the Legend or Explanation section of geologic map – age, rock type and formation names and symbols given.
- Understand the cross-sections on a geologic map if printed on map.
- Understand the scale of map and the border positions (latitude/longitude)

- Scales are almost always given as both fractional scale and bar scales; recognize that bar scales are more accurate when used carefully.
- Understand basic stream and river concepts and how they interact with contours.
- Application of relative dating and structure rules to decipher geologic history of mapped region.
- Interpret geology map in terms of tectonic settings and crustal stresses.
- Figure out timing of deformation events: Folding and faulting

### **3. Mountain/Desert Field Trip:**

- All rock types igneous to sedimentary to metamorphic (know how each forms and inter-relationships with each other – not just identification)
- Processes that operate at major tectonic boundaries.
- The four tectonic stages of development of the So Cal region with timing and observed evidence
  - Passive margin, Subduction, Rifting/Extension, and Transform
- Geologic and tectonic characteristics of the Peninsular Ranges Batholith (PRB)
  - Western versus Eastern Zones: Differences in tectonic settings, rock types; ages, emplacement depths
- Prebatholithic metamorphic rock types and their protoliths and origin of protoliths
- Uplift and erosion of PRB
- Desert geology and Salton Trough tectonics
- How the weather plays role in landscape formation, example here is rain-shadow effect (AKA orographic lifting of moist air)

### **4. Fluvial processes – San Diego River Field trip gave many examples of how humans interact with rivers**

- Terms and Concepts:
  - Discharge
  - Drainage patterns
  - Gradient
  - Energy of deposition or energy of erosion
  - Channel sediment Types
  - Flood Channel versus Plains

Flooding/ Flood stage

Measurements of stream flow (stilling well for example)

- Effects of Urbanization on a river system
- Channelization and its purposes
- Effects of paved/housed surfaces and Channelization on ground percolation and flooding behavior

## **5. Weather and Atmosphere**

- Measurements done in lab and field trips (pretty minimal measurements done)
- Knowledge of structure of atmosphere with regard to pressure, temperature.
- Understand water, the unusual substance, its 3 phases that exist on earth.
- Coriolis: Cause, effect, and sense
- High and Low pressure regions as they relate to larger weather system
- How do air masses move both vertically and horizontally
- Reading weather maps (several special symbols used)
- Predicting storm movement
- Predicting wind changes as storms pass an area (weather map sense again)