An introduction to techniques used by geologists in the field. Tools used include Brunton compass, aerial photographs, and hydrology equipment. Techniques will be applied to construct a geologic map during a required field trip.

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Office hours: Monday, Wednesday, Friday 9:15-10:00a, Tuesday & Thursday 11:00-12:15, Monday 1:00-3:00. Or contact me to set up an alternate time to meet (Ward)

Text: • Compton, R.R., 1985, *Geology in the Field*: new paperback published by Earthspun Press available through Amazon for $35: https://www.amazon.com/Geology-Field-Robert-R-Compton/dp/1547118776 (this is also the text used by ASU Field Camp and many others)

Grading: • Projects 1 – 8 and Project 9-an unannounced equipment shake down: 5% each
• Project 10: Geologic map of UTEP’s Research Ranch (20%), cross-sections (15%), and geologic report (20%)

Projects 1 – 8 should be fun and straightforward. Project 10 will be challenging and require much work, but will not be a test and you will receive much guidance.

Course Webpages
https://blackboard.angelo.edu contains additional resources for lab projects and your official grades.

Field Trips
1) March 11-15: Required Spring Break mapping trip to Indio Ranch, University of Texas at El Paso Research Station. We will stay in bunkhouses near our mapping area. See photos at http://www.utep.edu/indio/

Important: If you cannot participate in the Spring Break mapping project, you must withdraw from the course. No exceptions.

Student Learning Outcomes
1) To learn and practice skills needed for summer field camp, GEOL 3600, a 5 – 6 week field geology course,
2) To learn how to solve problems in the field; not just collect data in the field and think about it later. This means you will practice how to solve problems when it its hot or cold, when your legs are sore and punctured by lechuguilla, when you are distracted by pretty scenery, when the rocks look confusing, and when you have deadlines looming.
3) To learn how to write a scientific report containing data you collected. This will be a tiny version of a Master’s thesis.
4) To learn about the geology of West Texas and to address unsolved problems that are subjects of current research. Problems include: timing of Laramide and Basin and Range mountain building, significance of strike-slip faulting, and whether unconformities are present at some formation contacts.
Learning outcomes will be evaluated by graded lab projects, especially the Indio Ranch mapping project.

**Field Gear and Camping Gear Sources**

2) ASU, [http://www.angelo.edu/dept/university_recreation/Outdoor_Adventures/equipment_rental.php](http://www.angelo.edu/dept/university_recreation/Outdoor_Adventures/equipment_rental.php)

**Know the ASU Honor Code**

Angelo State University expects its students to maintain complete honesty and integrity in their academic pursuits. Students are responsible for understanding the Academic Honor Code, which is contained in both print and web versions of the Student Handbook.

Persons with disabilities which may warrant academic accommodations must contact the Student Life Office, Room 112 University Center, in order to request such accommodations prior to any accommodations being implemented. You are encouraged to make this request early in the semester so that appropriate arrangements can be made.

A student who intends to observe a religious holy day should make that intention known in writing to the instructor prior to the absence. A student who is absent from classes for the observance of a religious holy day shall be allowed to take an examination or complete an assignment scheduled for that day within a reasonable time after the absence.
<table>
<thead>
<tr>
<th>Week</th>
<th>Location</th>
<th>Lab projects</th>
<th>Skills (and sections to read in Compton, 1985)</th>
</tr>
</thead>
</table>
| I 1/16 | ASU VIN 158 | 1: Topographic maps and stereo aerial photos  
Review field equipment list for Spring Break Mapping trip | 1) Using stereo aerial photos (7-1)  
2) Topographic map details (6-1 – 6-3)  
3) Philosophy and organization of a field study (1-1 – 1-7)  
4) Determining and using your pace (2-8) |
| II 1/23 | Spillway Hill | LAB 1 DUE AT 3:00  
2: The first important mapping question: Where exactly am I? Locating with topo maps, aerial photos, and compasses | 1) Setting declination on Brunton compass (2-4)  
2) Taking bearings, triangulating (2-5, 6-3)  
3) Using aerial photos in the field (7-1 – 7-8)  
4) Brunton parts you need to know (2-4) |
| III 1/30 | ASU VIN 158 | LAB 2 DUE AT 3:00  
3: Constructing a geologic cross-section | 1) Weird and wonderful geologic map symbols (Appendix 7 – 8)  
2) Review how to distinguish 4 contact types  
3) Review how to make a geologic cross-section (6-5) |
| IV 2/6 | Nasworthy Spillway below ASU Lake house | LAB 3 DUE AT 3:00  
4: Measuring and plotting lines and planes, Interpreting strike and dip from Rule of V’s | 1) Review of strike and dip  
2) How to use a Brunton compass to measure lines and planes (3-5, 3-6)  
3) Rule of V’s for interpreting dip (6-4) |
| V 2/13 | ASU VIN 158 | LAB 4 DUE AT 3:00  
5: Mapping from aerial photographs of Mariscal Mtn, Big Bend National Park | How to map on aerial photos (7-1 – 7-8) |
| VI 2/20 | Ward Ranch South of San Angelo | LAB 5 DUE AT 3:00  
6: Making a simple geologic map  
Field gear shakedown | 1) Locating and drawing geologic contacts (5-2)  
2) Writing usable field notes (3-1)  
3) Describing sedimentary rocks (4-1- 4-3) |
| VII 2/27 | ASU VIN 158 | LAB 6 DUE AT 3:00  
Introduction to geology of Indio Mountains | |
| VIII 3/6 | ASU VIN 158 | 7: Final field equipment shakedown (bring all field gear)  
Indio Mountains trip details  
Detailed Lab 8 assignment distributed  
Field safety: avoiding, diagnosing, and treating heat exhaustion, snake bites, broken bones…  
Food money due | |
| IX 3/11-15 | Field trip to UTEP Research Station, Indio Mtns | 8: Spring Break Mapping Project  
FIELD MAP DUE 3/15 | How to function in the field (excerpt from Davis and Reynolds, 2012) |
| X 3/20 | ASU VIN 158 | Review of expected outcomes (optional) | |
| XI 4/3 | ASU VIN 158 | INDIO MOUNTAINS REPORT DUE AT 3:00  
FINAL DRAFTED GEOLOGIC MAP AND STRATIGRAPHIC COLUMN DUE AT 3:00 | 1) Drafting techniques (16-2, 16-3)  
2) Organization of geologic maps and reports (16-1 – 16-6) |

Lab projects will not be accepted after the due date.
REQUIRED EQUIPMENT FOR INDO MOUNTAINS FIELD WORK – SPRING BREAK MAPPING TRIP

Items Angelo State University will provide are highlighted
Items in **bold** are especially important

**General equipment:**
1. **Sturdy boots with thick, rugged soles such as Vasque, HiTek, Asolo, Solomon, or Lowa** visit Happy Trails, www.footwearoutfitters.net, www.campmor.com, www.rei.com
2. tennis shoes for wearing around camp
3. **small** tent and groundcloth (optional, if you do not want to stay in the bunkhouse!)
4. warm sleeping bag
5. light cotton sheet
6. foam pad
7. folding lawn chair
8. sturdy day pack (one with an internal frame works best)
9. clothing; many layers, be prepared for mainly hot but also possibly cold weather (it could possibly be in the 30s at night or be >100 F!), Some things you need are:
   a. Blue jeans AND 1-2 pairs of lightweight, light-colored long pants, such as camo Army surplus from Coles Army Surplus (blue jeans may be too hot!)
   b. socks; **use 2 layers** for each day, have enough for 5 days
   c. 1 pair shorts (not suitable for field work!)
   d. long underwear tops and bottoms
10. 2 bandanas
11. very small first aid kit to keep in pocket of daypack: different sizes of bandaids, antiseptic wipes, tweezers, needle
12. sunscreen
13. wide-brimmed hat for sun-protection
14. insect repellant
15. chapstick
16. toiletries: toothbrush, soap, shampoo, towel, etc
17. eating utensils: plastic or metal cup, bowl plate, spoon, fork, coffee cup
18. small pocket knife
19. flashlight, batteries
20. extra set of glasses and/or car keys
21. 2 big duffle bags to bring everything in
22. rain jacket or poncho

**Field equipment:**
1. hand lens (10x Hastings triplet)
2. **1-Liter water bottles and hydration pack totaling 5 Liters**
3. belt pouch to hold pencil, pens, eraser, field notebook (recommended: Plateau Design Field Pouch, www.ascscientific.com)
4. 2 mechanical pencils, 0.5-mm leads
5. Colored pencils, small set
6. Eraser, pencil-size with clip
8. **Field notebook:** buy from Dr. Satterfield if you need one
9. Brunton compass
10. Sturdy belt suitable for attaching Brunton compass and belt pouch
11. Black extra-fine point pen such as Pilot Precise V5 RT
12. **Map case or clipboard with storage compartment, plastic or aluminum**
13. Sharpie marker pen
14. 12-inch ruler and small protractor
15. **Small acid bottle**
16. **Radio, 2-way, for each group**
17. Grain size template
18. **Snakebite first aid kit (Sawyer suction device) for each group**
19. **Watch**

**Optional:**
1) guitar
2) camera
3) book or Kindle

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**Others:** ______________________________________________________

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