GEOL 3102: FIELD METHODS IN GEOLOGY, SPRING 2019

GEOL 3102. Field Methods in Geology. An introduction to geologic mapping techniques. Tools used include Brunton compass, aerial photographs, and field notebook. Techniques will be applied to construct a geologic map during a required field trip over Spring Break. Should be taken immediately before taking Summer Field Camp (GEOL 3600).

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Office hours
- Monday and Wednesday: 8:00 – 10:00 am, 2:00 – 3:00 pm
- Tuesday and Thursday: 11:00 – 12:00 noon
- Friday: 8:00 – 10:00 am
- Or contact me to set up a convenient time to meet

Required Textbooks
- Compton, R.R., 1985, Geology in the Field: new paperback published by Earthspun Press available through Amazon for $35: Amazon Compton (1985) Website¹ (this is also the text used by ASU Field Camp and many others)
- Standard geology Field Book. You can purchase Sokkia Field Book from Dr. Joe for $10; see details at ASC Scientific Website²

Grading
- Lab Projects 1 - 8 (6% each)
- Project 9: Indio Mountains Mapping Project (Lab Project 8): 52% (cross-section 10%, field map 10%, field notes in field book (5%), stratigraphic column 5%, drafted map 12%, report 10%)
- Projects 1 – 8 should be fun and straightforward. Project 9 will be challenging and require much work, but will it not be a test and you will receive much guidance.

Geologic Mapping Trip!
March 10-14: 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 Indio Ranch website³

Important: If you cannot participate in the Spring Break mapping project, you must withdraw from the course. No exceptions!
<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Topics and Due Dates</th>
<th>Sections in Compton (1985) to Read</th>
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| I: 1/17  | ASU VIN 146                           | 1: Topographic maps, stereo aerial photos Basics of base maps, aerial photos, field projects 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)  
(Numbers in parentheses are sections in Compton, 1985) |
| II: 1/24 | Spillway Hill                         | 2: Locating positions in the field The first important mapping question: Where exactly am I? Locating positions with topo maps, aerial photos, and compasses PROJECT 1 DUE | 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: 1/31| ASU VIN 146                           | 3: Constructing a Geologic Cross-section Testing and making predictions from your map: How does it work in 3 dimensions? PROJECT 2 DUE | 1) Weird and wonderful geologic map symbols you have not seen before (Appendix 7 – 8)  
2) Review how to distinguish 4 contact types  
3) Review how to make a geologic cross-section (6-5) |
| IV: 2/7  | Nasworthy Spillway below ASU Lake house| 4: Measuring and plotting lines and planes Using a Brunton compass to measure strikes-and-dips and trends-and-plunges. The fun comes from plotting data in the field to solve problems. PROJECT 3 DUE | 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: 2/14  | ASU VIN 146                           | 5: Reconnaissance mapping on an Aerial photo Bring your laptop to lab. Mapping in the office will give you ideas to test before Day 1 in the field! Practice with Google Earth and stereo photos PROJECT 4 DUE | 1) How to map on aerial photos (7-1 – 7-8) |
| VI: 2/21 | River Bend Area, San Angelo State Park | 6: Making a simple geologic map Dress in field clothes and bring field gear! Geologic maps are made in the field. Field gear shakedown, First opportunity PROJECT 5 DUE | 1) Locating and drawing geologic contacts (5-2)  
2) Writing usable field notes (3-1)  
3) Describing sedimentary rocks (4-1- 4-3) |
| VII: 2/28| ASU VIN 146                           | 7: Introduction to writing a geology field report Introduction to geology of Indio Mountains Summarize stratigraphy, structure of Chihuahua Tectonic Belt using 2-3 papers (provided) Approaches to writing research reports PROJECT 6 DUE | Organization of geologic maps and reports (16-1 – 16-6) |
| VIII: 3/7 | ASU VIN 146                           | 8: Final field equipment shakedown Bring all field gear on shakedown list Indio Mountains trip details, $50 for food due Detailed Project 9 assignment distributed Field safety: avoiding, diagnosing, and treating PROJECT 7 DUE | |
| IX: 3/10-14 | Field trip to UTEP Research Station, Indio Mtns | 9: Spring Break Mapping Project FIELD MAP DUE 3/14 | How to function in the field (excerpt from Davis and Reynolds, 2012) |
| X: 3/21  | ASU VIN 146                           | 9: Review and discussion of expected outcomes | 1) Drafting techniques (16-2, 16-3) |
| XI: 4/4  | ASU VIN 146                           | 9: INDIO MOUNTAINS REPORT DUE FINAL DRAFTED GEOLOGIC MAP DUE STRATIGRAPHIC COLUMN DUE | |
Late Assignment Policy

- Ten points deducted if assignment turned in after due date
- Late assignments not accepted after graded labs returned or key posted

Student learning outcomes

1. To learn and practice skills needed for summer field camp, GEOL 3600, a 5- or 6-week field geology course. Look at Sul Ross State University Field Camp, Sul Ross Field Camp information or Indiana University Field Camp, Indiana University Field Camp information.
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 is 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. Your Indio Ranch report 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.
5. Learning outcomes will be evaluated by graded lab projects, especially the Indio Ranch mapping project.
6. Also read University of Texas Field Methods course objectives and Field Camps Train the Next Generation of Petroleum Geologists (reading assignment before classes!)

Course Webpages

The Angelo State Blackboard site contains PowerPoint slides, web links to scenic areas mentioned in class, practice problems, answers to lab assignments, and your official grades.

Field Gear and Camping Gear Sources

1. Happy Trails, San Angelo, Happy Trails website.
2. ASU, Outdoor Adventures Equipment Rental Information.
3. ASC Scientific, Geology Equipment Website.

Academic Integrity

Students are expected to maintain complete honesty and integrity in all work. Any student found guilty of any form of dishonesty in academic work is subject of disciplinary action and possible expulsion from ASU. The College of Science and Engineering adheres to the Statement of Academic Integrity.

Plagiarism

Plagiarism is a serious topic covered in ASU’s Academic Integrity policy in the Student Handbook. Plagiarism is the action or practice of taking someone else’s work, idea, etc., and passing it off as one’s own. Plagiarism is literary theft.

In your discussions and/or your papers, it is unacceptable to copy word-for-word without quotation marks and the source of the quotation. It is expected that you will summarize or paraphrase ideas giving appropriate credit to the source both in the body of your paper and the reference list. Papers are subject to be evaluated for originality via Turnitin. Resources to help you understand this policy better are available at the ASU Writing Center.
Copyright Policy
Students officially enrolled in this course should make only one printed copy of the given articles and/or chapters. You are expressly prohibited from distributing or reproducing any portion of course readings in printed or electronic form without written permission from the copyright holders or publishers.

Student Disability Services
ASU is committed to the principle that no qualified individual with a disability shall, on the basis of disability, be excluded from participation in or be denied the benefits of the services, programs or activities of the university, or be subjected to discrimination by the university, as provided by the Americans with Disabilities Act of 1990 (ADA), the Americans with Disabilities Act Amendments of 2008 (ADAAA), and subsequent legislation.

The Office of Student Affairs is the designated campus department charged with the responsibility of reviewing and authorizing requests for reasonable accommodations based on a disability, and it is the student’s responsibility to initiate such a request by contacting: Ms. Dallas A. Swafford, Director of Student Disability Services, 325-942-2047

Title IX
Angelo State University is committed to the safety and security of all students. If you or someone you know experience sexual harassment, sexual assault, domestic or dating violence, stalking, or discrimination, you may contact ASU’s Title IX Coordinator: Michelle Nicole Boone, J.D., Director of Title IX Compliance, 325-486-6357, michelle.boone@angelo.edu, Mayer Administration Building 204A

Student Absence for Observance of Religious Holy Days
A student who intends to observe a religious holy day should make that intention known in writing to the instructor prior to the absence. See ASU Operating Policy 10.19 Student Absence for Observance of Religious Holy Day for more information

Incomplete Grade Policy
It is policy that incomplete grades be reserved for student illness or personal misfortune. Please contact faculty if you have serious illness or a personal misfortune that would keep you from completing course work. Documentation may be required. See ASU Operating Policy 10.11 Grading Procedures for more information.

General Policies Related to This Course
All students are required to follow the policies and procedures presented in these documents:

- Angelo State University Student Handbook
- Angelo State University Catalog
REQUIRED EQUIPMENT FOR INDIO MOUNTAINS FIELD WORK – SPRING BREAK MAPPING TRIP
Items in bold are especially important. Items Angelo State University will provide are highlighted.

General equipment:
2. tennis shoes for wearing around camp
3. small tent and groundcloth (optional, bring if you do not want to stay in the bunkhouse!)
4. warm sleeping bag
5. light cotton sheet
6. foam pad
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 be in the 30s at night or be >100)

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
   e. sweater and medium-weight jacket
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. Toboggan or stocking cap
15. Gloves for warmth
16. insect repellant
17. chapstick
18. toiletries: toothbrush, soap, shampoo, towel, etc
19. eating utensils: plastic or metal cup, bowl plate, spoon, fork, coffee cup
20. small pocket knife
21. flashlight
22. 2 big duffle bags to bring everything in
23. rain jacket or poncho

Field equipment:
1. hand lens (10x Hastings triplet) on lanyard
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. Rock hammer, 22-ounce, pointed tip Estwing is the standard
20. Watch

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

Others: ___________________________________________________________________________