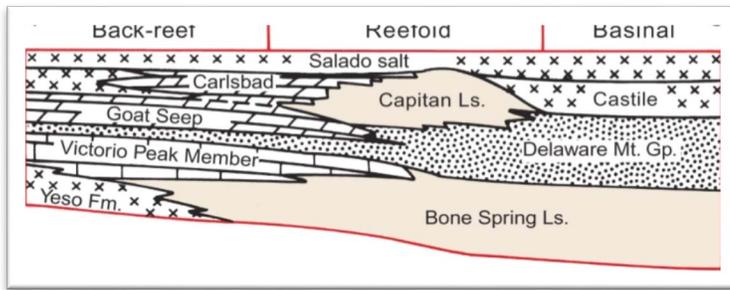


GEOL 3402: SEDIMENTOLOGY, FALL 2019



Stratigraphy of the Guadalupe Mountains, western Permian basin. San Angelo is on the eastern shelf of the basin (Prothero and Dott, 2009).

Professor: Dr. J.I. "Joe" Satterfield

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Office hours

- Monday: 8:00 – 9:00, 10:00 – 11:00 am, 2:00 – 4:00 pm
- Tuesday: 9:00 – 11:00 am
- Wednesday: 8:00 – 9:00 am
- Thursday: 10:00 – 11:00 am, 2:00 – 3:00 pm
- Friday: 8:00 – 9:00 am
- Or contact me to set up a convenient time to meet

Required Textbooks

1. Nichols, G., 2009, Sedimentology and Stratigraphy, Second Edition: Wiley-Blackwell, 419 p.
2. Tucker, M.E., 2011, Sedimentary Rocks in the Field: A Practical Guide: Wiley-Blackwell, 275 p.

Not Required (source materials for lecture notes)

1. Compton, R.R., 1985, Geology in the Field (textbook for GEOL 3102; Field Methods)
2. AAPG Memoir 627 Sandstone Depositional Environments
3. AAPG Memoir 656 Carbonate Depositional Environments
4. Facies Models 4: Geological Association of Canada GEOtext 6
5. George Asquith (Tech Professor), 2006, Basic Well Log Analysis, Second Edition

Grading

- 2 exams (10% each)
- 1 comprehensive final exam (12%)
- 1 hand-sample quiz over rock and mineral identification and description
- 12 graded lab projects, including weekend field trip, 5% each (60% total)
- Each student will schedule a brief individual meeting with Dr. Joe after Exam 1!

Required Lab and Field Equipment

1. Geology field book (Dr. Joe will order)
2. Hand lens, 10x, for for lab and field trips (10x Bausch & Lomb Hastings Triplet recommended)
3. Grain size template (Dr. Joe will order)

Schedule

Week	Lecture/Discussion topics	Labs
I 8/26, 8/28, 8/30	Introduction to GEO, AAPG, SGS, GSA, SEPM Introduction: Sedimentology, Stratigraphy (Ch 1) Graphic logs (Lab Manual Ch 2) Well-logging basics (Ch 22)	1: Review outside of common minerals in sedimentary rocks
II 9/4, 9/6	How to interpret SP, GR, and resistivity curves (Ch 22) Terrigenous Clastic Sediments: Gravel, Sand, Mud (Ch 2)	2: Susan Peak Oil Field Project Constructing a subsurface cross-section from well logs
III 9/9, 9/11, 9/13	Sandstone textures (Ch 2) Minerals in Sedimentary Rocks Sandstone Classification	2: Continued
IV 9/16, 9/18, 9/20	Biogenic and Chemical Sediments (Ch 3)	3: Sandstones and conglomerates in hand sample
V 9/23, 9/25, 9/27	Transport Processes and Sedimentary Structures (Ch 4)	4: Constructing a cross-section and stratigraphic column from geologic map of Big Bend National Park
VI 9/30, 10/2, 10/4	10/2: EXAM 1: Ch 1 - 5, 22 (Geophysical logging only) Aeolian Environments (Ch 8)	5: Carbonate rocks in hand sample
VII 10/7, 10/9, 10/11	Rivers and Alluvial Fans (Ch 9)	6: Sieving, grain-size analysis of beach, river, dune samples
VIII 10/14, 10/16, 10/18	10/14: Using Excel to plot Lab 6 data (Bring your laptop) Deltas (Ch 12)	7: Cretaceous measured section, Divide Road Cuts, Day 1
IX 10/21, 10/23, 10/25	Shallow Marine Carbonate and Evaporite Environments (Ch 15)	7: Cretaceous measured section, Divide Road Cuts, Day 2
X 10/28, 10/30, 11/1	Deep Marine Environments (Ch 16)	8: Sedimentary Petrography: Introduction to the petrographic microscope
XI 11/4, 11/6, 11/8	Post-depositional Structures and Diagenesis (Ch 18) Permian basin Sedimentology paper distributed	9: Other sedimentary rocks in hand sample
XII 11/11, 11/13, 11/15	Stratigraphic Concepts and Lithostratigraphy (Ch 19) 11/13: EXAM 2, Facies Models (Ch 9,10,12,13, 15, 16, 18)	10: Facies mapping
XIII 11/18, 11/20, 11/22	Lithostratigraphy, Part 2 (Ch 19) Biostratigraphy (Ch 20)	11: PAPER SUMMARY DUE Permian basin paper discussion 11/22: Lab 10 due
XIV 11/25	Dating and Correlation Techniques (Ch 21) Sequence Stratigraphy and Sea Level Change (Ch 23)	Review all hand samples
XV 12/2, 12/4, 12/6	Sedimentary Basins (Ch 24)	HAND SAMPLE QUIZ: SEDIMENTARY ROCKS AND MINERALS
XVI 12/11	12/9, 8:00 pm: Informal review 12/11, 8:00 – 10:00 am: FINAL EXAM (comprehensive)	NOTE: LAB 12 IS THE FIELD TRIP PROJECT

Lab projects submitted after the due date will receive a 10-point deduction!

Work turned in after graded work is returned to others will not be graded. (professional ethics issues)

Field Trips!

You are encouraged to attend more than one field trip. You are required to attend one. The field trip project will be your Lab 12. Our schedule:

- October 18 – 20: *Caprock Canyons State Park*, near Turkey, Texas. Camp for two nights. Describe and interpret Permian and Triassic rocks exposed beside hiking trails.
- November 2: *Llano uplift* near Kingsland, Llano, and Fredericksburg. Joint field trip with Petrology class.

Student learning outcomes

1. To study in more detail sedimentary rocks introduced in Physical and Historical Geology, such as how to describe and measure them, how to interpret the ancient environments they formed in, and how to correlate rocks and time across long distances. The geology of sedimentary rocks is the single most important topic to petroleum geologists.
2. To get hands-on experience in describing and interpreting rocks so that you will have a solid background when taking summer field camp, a 5-week field course (GEOL 3600), when working on your own research project (GEOL 4391), when taking geology courses in graduate school, and when employed as a professional geologist or engineer. The ultimate goal: a good working knowledge of how to describe and interpret whatever sedimentary rocks you encounter anywhere in the world. We will emphasize what can be done in the field with outcrops and hand samples.
3. To learn how to use standard geology tools in the field and the classroom. Tools used include: geophysical logs from oil wells, hand lens, sieves, petrographic microscopes (an introduction), Brunton Compass, and Jacob's Staff.
4. Learning outcomes will be assessed by exams, a lab practical, and graded lab projects

Course Webpages

The [Angelo State Blackboard site](#)¹ contains PowerPoint slides, web links to scenic areas mentioned in class, practice problems, answers to lab assignments, and your official grades.

Geoscience Careers

See Geoscience BS requirements in the [Angelo State Catalog](#)². A Geoscience Minor requires 18 hours of geology courses. Sedimentology is a requirement for a major and will count towards a minor in Geoscience. Rewarding careers exist for geologists, geophysicists, hydrogeologists, and secondary science teachers. Talk to your professors!

The [US Department of Labor Occupational Handbook](#)³ contains information on geology careers, salaries, education needed, and future job outlook in geology.

Join GEO and the AAPG!

One of your most rewarding responsibilities as a Geoscience major or minor is the chance to participate in activities of GEO, our organization of geology students at ASU, and the AAPG, the American Association of Petroleum Geologists, an international professional organization. GEO is a Student Chapter of the AAPG. GEO has supper meetings Wednesdays at 7:00 in VIN 139. The last Wednesday of the month we meet together with the San Angelo Geological Society (SGS) and host a significant geology talk by an outside speaker. GEO dues are \$15.00 / semester. AAPG student membership is free! To join AAPG fill out membership application at [AAPG website](#)⁴ AAPG membership is a course requirement.

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](#)⁵.

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](#)⁶

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](#)⁷ 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](#)⁸ 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](#)⁹
- [Angelo State University Catalog](#)¹⁰

¹ <https://blackboard.angelo.edu>

² <https://www.angelo.edu/catalogs/>

³ <https://www.bls.gov/ooh/life-physical-and-social-science/print/geoscientists.htm>

⁴ <https://www.aapg.org/>

⁵ <https://www.angelo.edu/student-handbook/community-policies/academic-integrity.php>

⁶ https://www.angelo.edu/dept/writing_center/academic_honesty.php

⁷ <https://www.angelo.edu/content/files/14206-op-1019-student-absence-for-observance-of>

⁸ <https://www.angelo.edu/content/files/14197-op-1011-grading-procedures>

⁹ <https://www.angelo.edu/student-handbook/>

¹⁰ <https://www.angelo.edu/catalogs/>