Spatial Geology

2018 / Summer II Semester
GOL 475.002
Spatial Geology

Name: Dr. Mindy Faulkner
Department: Geology
Email: mgshaw@sfasu.edu
Phone: (936) 468-2236
Office: E.L. Miller Science, Room 307
Office Hours: By appointment
Class meeting time and place: TBA

Course Description:
This course will focus on the application of GIS and spatial analyses to interpret geologic structures and formations.

Number of Credit Hours: Three semester hours

Course Prerequisites: Structural Geology, Petrology, Field Methods, GIS

Program Learning Outcomes:
1. Execute geologic procedures and methods accurately, appropriately and efficiently. (Skills)
2. Apply principles of logic and reasoning to develop and analyze geologic problems. (Logical - Reasoning)
3. Demonstrate competence in using various geologic tools, including technology, to formulate, represent, and solve problems. (Critical thinking - Problem Solving)
4. Demonstrate proficiency in communicating geologic information in an appropriate form to the expected audience. (Communication)

Student Learning Outcomes:
The student is expected to:

1. Recognize, identify and describe rocks from various field locations.
2. Produce a geologic map of an area.
3. Construct a geologic cross section.
4. Determine the geologic events that have occurred in an area.
5. Prepare a geologic report

Text and Materials:
ArcGIS, drafting equipment
Spatial Geology

Outline of Topics:

Regional Geology of western New Mexico
   Bear Mountain area, Gila National Forest
   • Rock descriptions (hand samples and thin sections)
   • Spatial analyses of geologic structures
   • Geologic history
   Walking X Peak area, Gila National Forest
   • Rock descriptions (hand samples and thin sections)
   • Spatial analyses of geologic structures
   • Geologic map
   • Cross-sections and geologic history

Regional Geology of northern Arizona
   Kaibab Plateau
   • Rock descriptions (hand samples)
   • Spatial analyses of geologic structures
   • Stratigraphic column
   • Depositional environment of the Kaibab Formation

Regional Geology of southwestern Utah
   Parowan Gap
   • Rock descriptions (hand samples and thin sections)
   • Spatial analyses of geologic structures
   • Geologic map
   • Cross-section and geologic history

Final Report
   Summary Report (5-7 pages; choose one topic from list below)
   • The origin of copper deposits in western New Mexico
   • Cenozoic volcanism in the southwestern United States
   • Structural evolution of the Kaibab Monocline in Arizona and Utah
   • Geology of the Navajo Sandstone in Zion National Park
   • Geology of the Grand Staircase National Monument
   • Geology of the Claron Formation in Bryce Canyon National Park
   • Geology of the Paradox Basin, Utah
   • Uranium deposits in the Morrison Formation, Colorado and Utah

Course Calendar: (*Projects may be changed or modified if necessary.)

<table>
<thead>
<tr>
<th>Orientation Date</th>
<th>Topic *</th>
<th>Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>June 29</td>
<td>Orientation</td>
<td></td>
</tr>
<tr>
<td>July 2</td>
<td>New Mexico Geology (Bear Mountain)</td>
<td>July 9</td>
</tr>
<tr>
<td>July 9</td>
<td>New Mexico Geology (Walking X)</td>
<td>July 16</td>
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<tr>
<td>July 16</td>
<td>Arizona Geology</td>
<td>July 23</td>
</tr>
<tr>
<td>July 23</td>
<td>Utah Geology</td>
<td>July 30</td>
</tr>
<tr>
<td>July 30</td>
<td>Final Reports</td>
<td>August 6</td>
</tr>
</tbody>
</table>
Spatial Geology

**Attendance Policy:**

Students are expected to be available on Mondays during a mutually agreed upon time for orientation. The rest of the week will be independent study. Some background material may be uploaded to d2l for ease of access.

**Grading Policy:**

Mapping projects and reports will be graded on the following criteria:

- Thorough rock descriptions
- Geologic interpretation of structural features
- Final geologic map
- Detailed cross-sections
- Complete geologic history
- Clarity
- Original thought*

*It is expected that you will use published material and literature as background; however, your geologic interpretations and descriptions, reports, and geologic histories will need to be in your own words.

Students are expected to learn to map different types of geology using remote techniques and interpret the geology of an area based on the data they acquire.

**Grades will be calculated in the following way:**

<table>
<thead>
<tr>
<th>Project</th>
<th>Points Possible</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Mexico geology (Bear Mountain)</td>
<td>50</td>
</tr>
<tr>
<td>Geologic history of Bear Mountain area</td>
<td>25</td>
</tr>
<tr>
<td>New Mexico geology (Walking X)</td>
<td>100</td>
</tr>
<tr>
<td>Geologic history Walking X area</td>
<td>25</td>
</tr>
<tr>
<td>Northern Arizona geology</td>
<td>50</td>
</tr>
<tr>
<td>Depositional environment of Kaibab</td>
<td>25</td>
</tr>
<tr>
<td>Southwestern Utah geology</td>
<td>100</td>
</tr>
<tr>
<td>Geologic history Parowan Gap area</td>
<td>25</td>
</tr>
<tr>
<td>Summary report</td>
<td>100</td>
</tr>
</tbody>
</table>

**Total Possible Points**

**Your points divided by the total point = %**

100 – 90% = A; 89 – 80% = B; 79 – 70% = C; 69 – 60% = D; 59 – 00% = F

**Academic Integrity (A-9.1)**

Academic integrity is a responsibility of all university faculty and students. Faculty members promote academic integrity in multiple ways including instruction on the
components of academic honesty, as well as abiding by university policy on penalties for cheating and plagiarism.

**Definition of Academic Dishonesty**
Academic dishonesty includes both cheating and plagiarism. Cheating includes but is not limited to (1) using or attempting to use unauthorized materials to aid in achieving a better grade on a component of a class; (2) the falsification or invention of any information, including citations, on an assigned exercise; and/or (3) helping or attempting to help another in an act of cheating or plagiarism. Plagiarism is presenting the words or ideas of another person as if they were your own. Examples of plagiarism are (1) submitting an assignment as if it were one's own work when, in fact, it is at least partly the work of another; (2) submitting a work that has been purchased or otherwise obtained from an Internet source or another source; and (3) incorporating the words or ideas of an author into one's paper without giving the author due credit.

Please read the complete policy at [http://www.sfasu.edu/policies/academic_integrity.asp](http://www.sfasu.edu/policies/academic_integrity.asp)

**Withheld Grades**

*Semester Grades Policy (A-54)*

Ordinarily, at the discretion of the instructor of record and with the approval of the academic chair/director, a grade of WH will be assigned only if the student cannot complete the course work because of unavoidable circumstances. Students must complete the work within one calendar year from the end of the semester in which they receive a WH, or the grade automatically becomes an F. If students register for the same course in future terms the WH will automatically become an F and will be counted as a repeated course for the purpose of computing the grade point average.

The circumstances precipitating the request must have occurred after the last day in which a student could withdraw from a course. Students requesting a WH must be passing the course with a minimum projected grade of C.

**Students with Disabilities**

To obtain disability related accommodations, alternate formats and/or auxiliary aids, students with disabilities must contact the Office of Disability Services (ODS), Human Services Building, and Room 325, 468-3004 / 468-1004 (TDD) as early as possible in the semester. Once verified, ODS will notify the course instructor and outline the accommodation and/or auxiliary aids to be provided. Failure to request services in a timely manner may delay your accommodations. For additional information, go to [http://www.sfasu.edu/disabilityservices/](http://www.sfasu.edu/disabilityservices/).