

**GEOLOGY 302 Geology of the Black Hills Region 2023**  
DEPARTMENT OF EARTH, ENVIRONMENTAL, AND GEOSPATIAL SCIENCES  
NORTH DAKOTA STATE UNIVERSITY  
COURSE INFORMATION AND SCHEDULE – SUBJECT TO CHANGE

**Field Course Dates:** Sept. 9 - 15, 2023  
**Location:** Sugihara Hall and areas of ND, WY and SD!  
**Instructor:** B. Saini-Eidukat, 208 Sugihara Hall, ph 701-231-8785  
email: bernhardt.sainieiduk@ndsu.edu  
**Office hours:** Tuesday, 2:00 - 4:00 pm or by appointment  
**Web Site:** <http://www.ndsu.edu/pubweb/~sainieid/black-hills/>  
**Class Meet Time:** Tuesdays, 4:00 - 4:50 pm, Sept 2, 29, and 5

**Course Description from Bulletin:**

Stratigraphy, structure, and mineralogy of the Black Hills and Williston Basin. Introductory lectures, plus seven-day field excursion. Two Semester Credits. Offered periodically. Fee required. Recommended: GEOL 105, 105L, 106, 106L.

**Intended Student Outcomes:**

This course provides an introduction to the geologic units and processes active now and in the past in the region of western North and South Dakota and eastern Wyoming and Montana. Students will achieve an appreciation of the stratigraphy, paleontology, karst areas, geologic history, economic geology (both energy and minerals), structural geology, mineralogy, and petrology of the Black Hills and Williston Basin.

**Itinerary:**

Theodore Roosevelt National Park, ND; Makoshika State Park, Montana: Stratigraphy of the Hell Creek (U. Cretaceous) and Tullock (= Ludlow) (Paleocene) Formations; Fossil collecting in the Cedar Creek Valley; Cedar Creek Anticline; Devils Tower National Monument, WY; Black Hills, SD: Bridal Veil Falls; Homestake Mine Pit; Museum of Geology at South Dakota School of Mines; Mount Rushmore; Igneous and metamorphic rocks; Structures of the Black Hills; Karst features; South Dakota Badlands.

**Sat Sept 9:**

Leave Sugihara Hall 7:00 am  
Glacial geology  
Heritage Center, Bismarck  
Geology, paleoecology and sedimentary environment of sediments exposed in Theodore Roosevelt Natl Park  
Overnight camping Cottonwood Campground, Theodore Roosevelt Natl Park

**Sun Sept 10:**

Theodore Roosevelt Natl Park  
Glendive area  
Makoshika State Park  
Colgate Member of the Fox Hills Formation  
Cedar Creek anticline and Cretaceous fossil hunting  
Overnight at Camp Needmore, near Ekalaka, MT

Mon Sept 11:

Devils Tower, Wyoming  
Spearfish Canyon and Bridal Veil Falls  
Homestake Mine overlook, Lead, SD  
Overnight at No Name City RV Park, Sturgis, SD

Tues Sept 12:

Rapid City – Museum of SD School of Mines  
Keystone Tunnel Schist  
Pegmatite Mines  
Mount Rushmore  
Overnight at Fort Welikit Campground, Custer, SD

Wed Sept 13:

Tip Top pegmatite mine  
Wind Cave  
Mammoth Site, Near Hot Springs, SD  
Return to Fort Welikit Campground, Custer, SD

Thurs Sept 14:

SD Hwy 44 southeast  
Badlands National Park  
Volcaniclastic, fluvial and lacustrine deposits of the White River and  
Arikaree Groups. Pierre Formation. Clastic dikes, paleosols  
Overnight at Farm Island Recreation Area, Pierre, SD

Fri Sept 15:

Dog Butte – fossils  
Mobridge SD – fossils  
Return to Fargo

**Post-trip paper / project assignment:**

Each participant will volunteer for (or be assigned) a topic related to a stop for the field trip, itself, or a general topic related to the trip. The participant will thoroughly research the topic, and prepare a 6 to 8 page report to be submitted after the trip. Topics must be approved by the instructor. Alternate project submission formats (Wikipedia entry edits, etc.) will be considered. For help in selecting a topic and discussing a project format, please visit with the instructor.

The paper / project should include an adequate, professional, and even rigorous overview of the chosen topic. It should be supported by graphics, by citations in the text to reference sources, and a well-presented list of reference sources. References should give author name(s), date, title, journal or book title, and volume/page numbers.

**Deadline for submission of assignment:**

11:59 p.m. MONDAY, NOV 6, 2023. (uploaded to Blackboard)

**Grading:**

Grades will be based on the following considerations:

For undergraduates (Geol 302), the primary criterion (75%) will be attendance and evaluation of the field notebook, including specific field exercises, to be turned in after the trip. 20% of the grade will be based on a post-trip paper / project. The final 5% of the grade will be based on the student's participation and cooperation with the instructor and fellow course participants, and the student's level of engagement with the course.

Those students registering for graduate credit (Geol 695) will be assessed as follows: attendance (60%) including evaluation of the field notebook including specific field exercises to be turned in after the trip, a post-trip research paper / project (20%), and an oral presentation (15%). The presentation could be in the field during the trip, or after the trip at a time to be arranged. The final 5% of the grade will be based on the student's participation and cooperation with the instructor and fellow course participants, and the student's level of engagement with the course.

Additional information will be posted on the course web site:

<http://www.ndsu.edu/pubweb/~sainieid/black-hills/>

**Special Needs:** Students who need special accommodations for learning or who have special needs are invited to share these concerns or requests with the instructor as soon as possible.

**Academic Responsibility:** All work in this course must be completed in a manner consistent with NDSU University Senate Policy, Section 335: Code of Academic Responsibility and Conduct ([www.ndsu.nodak.edu/policy/335.htm](http://www.ndsu.nodak.edu/policy/335.htm)).

Version August 3, 2023 – Subject to Change



The "Interior Formation" paleosol on the Cretaceous Pierre Fm, Badlands Natl. Park, SD