

SUMMER 2019
GEOLOGY SUMMER FIELD CAMP INFORMATION

www.kent.edu/geology

Director: Dr. David Hacker, dhacker@kent.edu

COURSE NUMBER AND CREDITS: Listed in the catalog for undergraduate students as Geology 41092 and for graduate students as Geology 51092, the Geology Summer Field Camp carries six semester credits in both cases.

PREREQUISITES: College-level courses in physical geology, historical geology, mineralogy, petrology, and structural geology. Geomorphology and paleontology are highly recommended but not required. Some of the prerequisites may be waived by obtaining written permission of the Field Camp Director. **Physical fitness:** Students must be prepared for strenuous hikes, some steep climbs, and working at altitudes of 4000-8000 feet. Consult with your physician if you have medical conditions that may impair your ability to do field work. For their safety and the safety of others, students who are unfit physically will be sent home.

DATES: As specified for that year by Kent State University's Registrar's Office. Students who will be using university transportation to the Black Hills are expected to assemble at 7:30 A.M., **Saturday, June 8**, at McGilvrey Hall (325 S. Lincoln St., Kent OH 44242) on the KSU campus, ready for departure.

Kent State University Summer I terms:

Summer 2019: Monday, June 10 - July 13

(KSU vehicles depart for the Black Hills on **Saturday, June 8**)

Room arrangements for the night before departure from Kent are the responsibility of the student. Accommodations are available at Kent Motor Inn, University Inn, and other motels. Write directly to these lodges for rates and reservations. **In the event a student wishes to leave a personal car on the KSU Kent Campus for the duration of the field camp, the student should contact the department secretary, Kelly Thomasson, 330-672-2680, in advance, to obtain parking instructions.**

Students who will be supplying their own transportation to the Black Hills are expected to meet the group at the Badlands National Park on the first Monday of the term (**June 10**) at **8:00 A.M.** The meeting place will be at the eastern-most overlook within the park, which is located only a short distance south of the eastern entrance.

If there is some difficulty that prevents meeting at this time and place, students should proceed to the Student Union, Black Hills State University, Spearfish (see section on room and board arrangements), and arrive there later in the day on the first Monday of the term. Do not check into the Black Hills State University prior to the arrival of the field camp director on Monday afternoon.

The field camp will terminate on the last Thursday of the term, in the afternoon (**July 11**). The University vehicles will return to Kent, Ohio, by late afternoon/early evening the last Saturday of the term (**July 13**).

CHECKLIST OF IMPORTANT DATES

February 28

Last day to pay \$100 non-refundable deposit to:
Director, Geology Summer Field Camp
Department of Geology
Kent State University
Kent, OH 44242

Time to submit guest application, (for non-KSU students)
Office of Admissions Phone: (330) 675-8860
Online form: <http://www.kent.edu/admissions/apply/undergraduate/guest.cfm>

February - May

Period for registration on-line

April

Time to get inoculation for tetanus

May

Deadline for payment of tuition and fees to the Bursar

(All registration and Field Camp fee payments must be done before leaving for Field Camp)

First Saturday of term

KSU vehicles depart for the Black Hills at 7:30 A.M., **Saturday, June 8**

First Monday of term

Field camp begins at 8:00 A.M., **Monday, June 10** at Badlands National Park, S. Dakota

Last Thursday of term

Field camp ends in afternoon at Black Hills on **Thursday, July 11**

Last Saturday of term

Return to Kent (late afternoon/early evening) on **Saturday, July 13**

COSTS

<u>Room, Board, Transportation, and Maintenance (subject to change)*</u> (Includes travel to map areas)	\$ 2040.00
<u>Tuition and Fees (subject to change)**</u>	
Undergraduate Ohio Resident upper division	\$ 2736.00
Undergraduate non-resident	\$ 4950.00
<u>Total for Undergraduate OHIO Resident (example):</u>	<u>\$4776.00</u>

* This cost covers double occupancy of a room in the dormitories of the Black Hills State University during our stay in the Black Hills (approximately four of the five weeks). This fee covers meals for Monday through Saturday lunch at the BHSU cafeteria. Other meals on the weekends (Saturday and Sunday) and while traveling (~ 13 days) are the responsibility of the student. A reasonable estimate of these additional days' board costs might be \$30.00 per day. If you anticipate additional food or personal expenses, you should plan to bring enough reserve money to cover that contingency. This also covers van transportation fees within the Black Hills and the Wyoming/Idaho trip. Students may also travel in vans out and back to the Black Hills from Kent.

** Check for exact fee schedule with Bursar's Office

RESERVATIONS: A \$100 non-refundable deposit must be paid on or before **February 28** in the form of a check or money order, made payable to:

DIRECTOR, GEOLOGY SUMMER FIELD CAMP,

and sent to:

DIRECTOR, SUMMER FIELD CAMP
DEPARTMENT OF GEOLOGY
KENT STATE UNIVERSITY
KENT, OHIO 44242

REGISTRATION: Registration must be done on-line at the Kent State University website starting in mid-February.

TUITION AND UNIVERSITY FEES ARE PAID DIRECTLY TO THE UNIVERSITY
AS DIRECTED AT THE TIME OF REGISTRATION,
(**NOT** to the Director of the Field Camp).

Non-KSU students **MUST** first apply for admission to Kent State University as GUEST STUDENTS.
Contact the Admissions Office at 330-672-2444 for further information.

Enrollment Cap: For Safety and pedagogical reasons, enrollment will be capped at 35 students.
Priority will be given to Kent State University geology majors until March 1, 2019.

PREPARATION

BAGGAGE: Students should limit their volume of baggage to one full duffel bag, plus sleeping bag and other camping gear. Past experience reveals that the suggested maximum volume is quite sufficient. **Your gear must be well packed in luggage bags (not trash bags)!**

PERSONAL SUPPLIES AND EQUIPMENT: each participant must supply the following equipment:

Day hike backpack (for lunch, water, rain gear, sun lotion, etc.)—*school daypacks are usually not sufficient.*

Geologic hammer

Safety glasses or some kind of eye protection

Hand lens (good quality, 10x)

Water bottle or camel-back water pouches (minimum 3 liters per day)

1 FRS 2-way radio WITH (EXTRA) BATTERIES

Clipboard

Text book – TBA

*Protractor

*Ruler or triangular scale

*Micron Pigma disposable black inking pens, sizes: 01(.25mm), 03(.35mm), 05(.45mm)

*Mechanical pencils

**Grain size folder \$3.00

**Set of 24 Berol Verithin colored pencils \$13.00

Field notebook of specified format will be provided to students

* Indicates items that are available at KSU Bookstore.

**Indicates items that are available in Main Geology Office or from the Director at Field Camp.

As for other personal items: no extraneous gear is allowed (e.g., skateboards, unicycles, mini-coolers, toys, etc). It is required that each participant have a good pair of well-broken-in field boots; an easily carried raincoat, poncho; a warm jacket; some type of hat; sunscreen, and clothes suitable for field work. **Cell phone use** is restricted to down time only (i.e., evenings, weekends). Students are not allowed to use cell phones during field time, in the vans, or before camp is completely set up on the Wyoming/Idaho trip, etc.

EQUIPMENT AND SUPPLIES FURNISHED BY KSU:

Brunton pocket transit, GPS units, Aerial photographs and base maps, pocket stereoscopes.

INOCULATIONS: All participants are required to obtain a current tetanus inoculation prior to the field trip. Any physician may administer these shots, or check with your physician to make sure inoculation is up to date.

ALCOHOLIC BEVERAGES, CIGARETTES, FIREARMS, ILLICIT DRUGS: NO alcoholic beverages, firearms, or drugs, in any form, except prescription medications, will be permitted in the field or in the BHSU dorms. Smoking is not permitted in the BHSU dorms.

Students dismissed from Field Camp for disciplinary reasons (including violations of the BHSU Code of Student Conduct) will be responsible for covering their own expenses related to returning home early.

HEALTH AND ACCIDENT INSURANCE: All field trip participants are required to obtain some form of health and accident insurance that will cover them for the duration of the trip.

ROOM AND BOARD ARRANGEMENTS: While traveling to and from the Black Hills, students who will be riding in KSU vehicles will stay at campgrounds and buy food at grocery stores. Students providing their own transportation are expected to make their own living arrangements in route to and from the Black Hills.

While in the Black Hills, all students attending the field camp will stay at the Residence Halls, Black Hills State University, Spearfish, S.D. Breakfast, sack lunch, and dinner will be available on campus, Monday through Saturday lunch. Saturday dinner and Sunday (all meals), students will make their own meal arrangements. Cooking is permitted only in designated areas in the dorms. Students must provide their own bedding and towels.

An itinerary for the camp will be provided so that students can inform family and friends of their whereabouts at any given time, and how they may be reached in case of an emergency. For present purposes, suffice it to say that the field trip will spend 4 weeks in the Black Hills and one week in Wyoming and Idaho.

COURSE OBJECTIVES: The fundamental purpose of this course is to teach geology in the field. To a large extent, doing geology in the field involves creating and interpreting geologic maps. The objective of field geology is to document the occurrence and spatial relationships of rocks exposed at the earth's surface, as well as to project these data at depth in the subsurface where direct observation is impossible. From this documentation, geologists make interpretations about earth processes and past events and make predictions about where resources might be found and when geologic hazards might occur in the future. Various field techniques are introduced in this course as necessary for the map-making exercises. This is a capstone experiential learning course in the Geology BS major as it allows the student to integrate and connect ideas, concepts, and skills obtained from your classroom courses using direct observations and critical thinking skills. Learning about geologic maps is one thing, but creating a geologic map from scratch is very different. The basis for every type of geologic study is rooted in observations made of rocks in the field. Understanding the fundamentals of field geology gives you an appreciation of the coherent and compelling field-based scientific arguments from which all other interpretations grow.

PROGRAM OF STUDY: The Black Hills of South Dakota provide as many good examples of different types of geology, within a short distance of each other, as any area in the United States. The stratigraphic section of the Hills is unusually complete, varied, and well exposed. The geomorphology is classic. Opportunities for paleontological study are also numerous, with excellent examples of using paleontology as an aid to geologic mapping. The Precambrian core of the Hills offers an outstanding terrain for studying structural features and tectonic processes, igneous/metamorphic rocks and processes, and economic geology.

During the stay in the Black Hills, the course runs for 6 days a week. A work day generally starts at 7:30 a.m. and ends, back in Spearfish, before 5:30 p.m., except for Saturday, when the work is usually over at 2:00 pm or so. Students are expected, however, to keep their field notebooks and/or maps up-to-date by working during the evenings. In addition, evenings are also used for informal as well as formal lectures and discussions about the geology currently under study.

Stratigraphic studies constitute the initial work in the Black Hills. While students become familiar with the rock units they will subsequently map, they are also instructed in the methods and techniques of describing stratigraphic sections. The geologic column of the Black Hills presents a virtually complete sequence of both Paleozoic and Mesozoic formations representing almost all sedimentary rock types and environments of deposition found in mid-North America. By these stratigraphic studies, the students are presented with an excellent opportunity to examine many aspects of sedimentation, sedimentary petrology, and stratigraphy.

In stratigraphic studies, as well as in all other aspects of the program of study, emphasis is placed on both field techniques and the way field observations should be recorded. Thus, the student does much more than simply look at rocks. Stratigraphic studies, for example, include instruction in such techniques as pace and compass traverses, trigonometric techniques for determining thicknesses of covered intervals and for

offsetting lines of measured sections, determining real from apparent dip, and many other standard field procedures.

As soon as it is practicable, stratigraphic and structural studies are combined in the form of map problems. There are a number of mapping exercises, each taking from two to five days. Two mapping problems involve delineation of structure in a metamorphic area of somewhat limited outcrop; here the fundamental techniques of geologic mapping are introduced. Another problem involves mapping a much larger area on a topographic base map and is a fairly straightforward exercise involving a simple folded structure defined by Phanerozoic sedimentary rocks. Mapping techniques pertinent to mapping sedimentary rocks are introduced with this exercise. This exercise also highlights the profound effects of topography on geologic map patterns. Another mapping exercise involves using aerial photographs, GPS, and topographic base maps in yet a larger, more remote area of somewhat daunting topographic relief. The structures mapped in this exercise are more complex than those of the first two, and include the study and description of deformations caused by local intrusions as well as folding and faulting related to the overall structure of the Black Hills. Other mapping projects emphasize producing highly detailed maps and cross-section contacts.

It is important to emphasize that these techniques are viewed, not simply as an end in themselves, but, rather, as the means to the larger, more encompassing goal of learning how to perform geologic field work. Map-making, then, is merely a necessary process toward the more *fundamental* goal of interpreting the geological evolution of a particular area of interest.

A secondary goal of field camp is to impart an appreciation for the geology of the entire Black Hills (not just the areas we map) and that of the larger Rocky Mountain region. Thus, in addition to the projects outlined above, investigations of the Precambrian terrain of the Hills are carried out. This is accomplished via field traverses in which we examine tectonic structures, mineralogical and petrographic features, and field relationships of the metamorphic and igneous rocks that constitute the Precambrian core of the Black Hills dome. These traverses will include visits to Mt. Rushmore and vicinity, the world-famous Black Hills pegmatites, and the Homestake gold mine. In addition, one week of the field camp is conducted in Wyoming and Idaho to help integrate the geology of the Black Hills into the larger framework of geologic evolution of the Rocky Mountains. Classic examples of volcanic terrains and their relationship to tectonic and mantle hot-spot events will be explored at such localities as the Absaroka Mountains, Yellowstone National Park, the Snake River Plain, and Craters of the Moon National Monument. Spectacular structures related to Sevier, Laramide, and Basin and Range tectonism will also be explored in localities such as the Bighorn Mountains; Powder River, Bighorn, and Wind River Basins; Rattlesnake Mountain; Owl Creek Mountains; and Teton National Park.

FURTHER INFORMATION: If you need additional information, please email the Director, Dr. David Hacker: dhacker@kent.edu

KENT STATE UNIVERSITY
GEOLOGY SUMMER FIELD CAMP
AT
BLACK HILLS STATE UNIVERSITY

MAIL:

All mail to you should be addressed as follows:

Your Name
Kent State University Geology Summer Field Camp
USB 9503
Black Hills State University
Spearfish SD 57799-9508

PHONE AND FAX:

Phone messages may be left for you at (605) 642-6464
FAX Messages may be sent to you at (605) 642-6024

All FAX messages must be addressed to:

Your Name
KSU Geology Summer Field Camp
ATTN: Residence Life Office

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KENT STATE UNIVERSITY SUMMER FIELD CAMP APPLICATION FORM

Please complete this two page form and return, with the \$100 deposit, by February 28 to:

Director, Summer Field Camp
Department of Geology
Kent State University
Kent, Ohio 44242

I. Personal Information

Name: _____ Gender: Male Female

Academic Institution Address:

Permanent Address:

Email Address: _____

Phone: _____ Cell Phone: _____

I intend to ride to and from Field Camp in Black Hills in a KSU vehicle: YES NO

II. Academic Information

Intended Degree: B.A. B.S. M.S. Ph.D. Intended Major: _____

KSU considers me to be a resident of (state): _____ Student status: undergraduate graduate

Check courses you will have taken before Field Camp:

<input type="checkbox"/> How the Earth Works (Physical Geology)	<input type="checkbox"/> Paleontology
<input type="checkbox"/> Earth & Life Through Time (Hist Geology)	<input type="checkbox"/> Structural Geology
<input type="checkbox"/> Earth Materials I (Mineralogy)	<input type="checkbox"/> Geomorphology
<input type="checkbox"/> Earth Materials II (Petrology)	<input type="checkbox"/> Field Methods
<input type="checkbox"/> Stratigraphy/Sedimentology	

III. Medical and Health Insurance Information

List any allergies, either to natural substances or medication, of which the Field Camp Director should be aware:

List all medical problems you have:

HEALTH INSURANCE: All participants must have health insurance that will cover them for the duration of the trip.

Health Insurance Co.: _____ Policy # (required): _____

IV. Emergency Contact Information (Required)

Name of emergency contact: _____ Relationship: _____

Address of emergency contact: _____

Emergency Phone: _____ Emergency Cell: _____

Emergency Email: _____

Acknowledgement and acceptance of rules, regulations and policies for participating in the
Kent State Geology Summer Field Camp

Initialize

_____ I understand that I may be sent home if I am physically unfit to fully participate in the rigorous daily hikes required for this field course.

_____ I understand that I may be sent home if I violate KSU rules of student conduct, BHSU rules of student conduct, or State laws at any time during the Field Camp.

_____ I understand that this field course requires that I be in the field six days a week (Monday through Saturday).

_____ I understand that it is my responsibility to acquire and wear appropriate field clothes and gear whenever I am in the field.

_____ I understand that I am not allowed to use my mobile phone during field time, in the vans, or before camp is completely set up on the Wyoming/Idaho regional field trip.

_____ I understand that I am responsible for equipment and supplies furnished to me by KSU for field camp.

_____ I understand that I am not allowed to drink alcohol, use illicit drugs, or have firearms in the field or in the BHSU dorms.

_____ I understand that I must always stay with my assigned mapping partners in the field.

_____ I understand that I am expected to be courteous and respectful to my field partners, the teaching assistants and the faculty instructors throughout the course.

_____ I understand that I cannot text or disobey traffic laws when driving.

This program involves physically demanding fieldwork in sometimes unpleasant weather conditions, and working and living in close quarters with a diverse group over an extended period. We are particularly concerned that students be (1) enthusiastic and engaged, and (2) of an appropriate temperament and work ethic for this kind of program. To that end please read and respond to the scenario described here:

It is June in the Black Hills, and temperatures are nearly 100⁰F. After a long day of field work with extensive hiking, including encounters with knee high PI (poison ivy), you return to dorm for dinner to learn that the faculty have called a meeting to discuss the day's activities and goals for the next day. You also need to work with your field group on maps and a cross-section that are both due in two days. Describe what you would do to maintain a positive attitude and to contribute to the group work and the discussion. (Do not write beyond this page).

_____ signature _____ date