



# UNIVERSITY OF HOUSTON – YBRA SUMMER GEOLOGY FIELD CAMP



2008 SUMMER SESSION I  
Advanced Geosciences Majors:  
June 3 – July 8, 2008

2008 SUMMER SESSION IV  
Advanced or Beginning  
Geosciences Majors:  
July 8 – August 12, 2008

The YBRA field course was operated continuously by Princeton University from 1933 until 1991; in 1992 administration of the course was transferred to the University of Pennsylvania. For 2008 that administration has been transferred to the Department of Geosciences at the University of Houston, which plans to offer two sessions in the summer of 2008 open to all Universities. The University of Houston offers four summer semesters (I – IV), and for registration purposes the field camps will be taught during two summer semesters: Summer Session I (the first half of the summer) and Summer Session IV (the second half of the summer).

Summer Session I will be offered to advanced undergraduate or graduate Geology majors who have already taken courses in Stratigraphy, Structural Geology or their equivalent. Summer Session IV will be offered to both beginning undergraduate geology majors who may have taken fewer major courses (e.g., Physical Geology, Historical Geology, Mineralogy) as well as advanced undergraduate Geology majors with Stratigraphy and Structural Geology prerequisites.



## COURSE OBJECTIVES AND CURRICULUM

This course is designed to enable undergraduate geology majors to learn how geologic problems are defined and addressed in the field; to enhance field measurement and mapping skills; and to bring their growing technical skills to focus on a series of field problems in sedimentary, igneous, metamorphic rocks. For beginning majors in geology attending Session IV, the course will also test whether the intellectually challenging and physically demanding lifestyle of the field geologist is consistent with their personal career aspiration.

The course stresses basic field techniques, including mapping on topographic base and air photos and fundamental field measurements in a variety of rock types. Students will be introduced to the use of hand-held Global Positioning Satellite (GPS) technology to complement the task of fixing positions by reference to topographic maps and air photos in the field. Emphasis is on Structural and Stratigraphic Geology in independent mapping, and includes problems in sedimentary, igneous and metamorphic terranes at reconnaissance and detailed scales. The regional geology of the Bighorn Basin, surrounding mountain ranges, the Stillwater Layered Igneous Complex, and the Yellowstone volcanic province will be reviewed on a series of short trips.

Each summer Session operates on a full six-day week, is graded, and is regarded as equivalent to two full course units, or six semester hours, at participating institutions. Advanced students seeking 6 credit hours should register for GEOL 3355 and GEOL 3360. The field course taught in summer session IV from July 8<sup>th</sup> to August 12<sup>th</sup> will accommodate both beginning and advanced students registering for 3 semester hours if, e.g., six hours of credit are not required by the home institution. Beginning students should register for GEOL 3355 and advanced students should register for GEOL 3360. Advanced students seeking 6 hours of credit should register for both GEOL 3355 and GEOL 3360. Contact us if you have specific questions about your

qualifications for these courses. Registering for 3 hours of credit will also result in lower tuition and overall costs, but the length of the camp and daily schedule during Summer Session IV will remain the same for those seeking 6 or 3 credit hours.

## ACADEMIC STAFF AND STUDENTS

For 2008, the field-course faculty will be drawn from the Department of Geosciences at the University of Houston, and from the ranks of college and university Geology professors who conduct field research in the northern Rocky Mountains. Students from 22 schools participated in the course in 2007, and were taught by faculty from the University of Montana at Dillon, University of Memphis, Rocky Mountain College, and Washington University at St. Louis. Participants of this program include students from, among others, the following institutions:

- Amherst University
- Duke University
- Franklin & Marshall College
- Harvard University
- Johns Hopkins University
- Mount Holyoke College
- Penn State University
- Princeton University
- Rice University
- University of Houston
- University of Maryland
- University of Pennsylvania
- University of the South
- Washington & Lee University
- Wesleyan University
- Whitman College
- Williams College
- Yale University

By working with students and faculty from a number of institutions, participants in the course are exposed to a variety of ideas and teaching strategies, and are able to focus their objectives for graduate study with the benefit of broader experience.

## FACILITIES

The course is based at the Yellowstone-Bighorn Research Association (YBRA) Camp near Red Lodge, a small town in Southwest Montana. The camp also accommodates faculty and graduate students conducting research nearby.

Lectures, labs, and informal discussion sessions are held in the large classroom buildings designed and constructed for those purposes. Recreational facilities at the camp are limited; there is a volleyball court, a ping pong table, and a horseshoe pitch. The camp adjoins the Custer

National Forest, and offers unlimited opportunities for hiking, jogging, and other physical-fitness endeavors.

In addition to the Lodge, in which the lounge, dining room, and kitchen are located, the camp includes cabins and dorms scattered among the pines and aspen for as many as 80 faculty, students, and staff. Two modern bath house facilities are located adjacent to sleeping accommodation, which are rustic but comfortable. Internet access is available on a time-limited basis. For more information on YBRA facilities, visit [www.ybra.org](http://www.ybra.org)



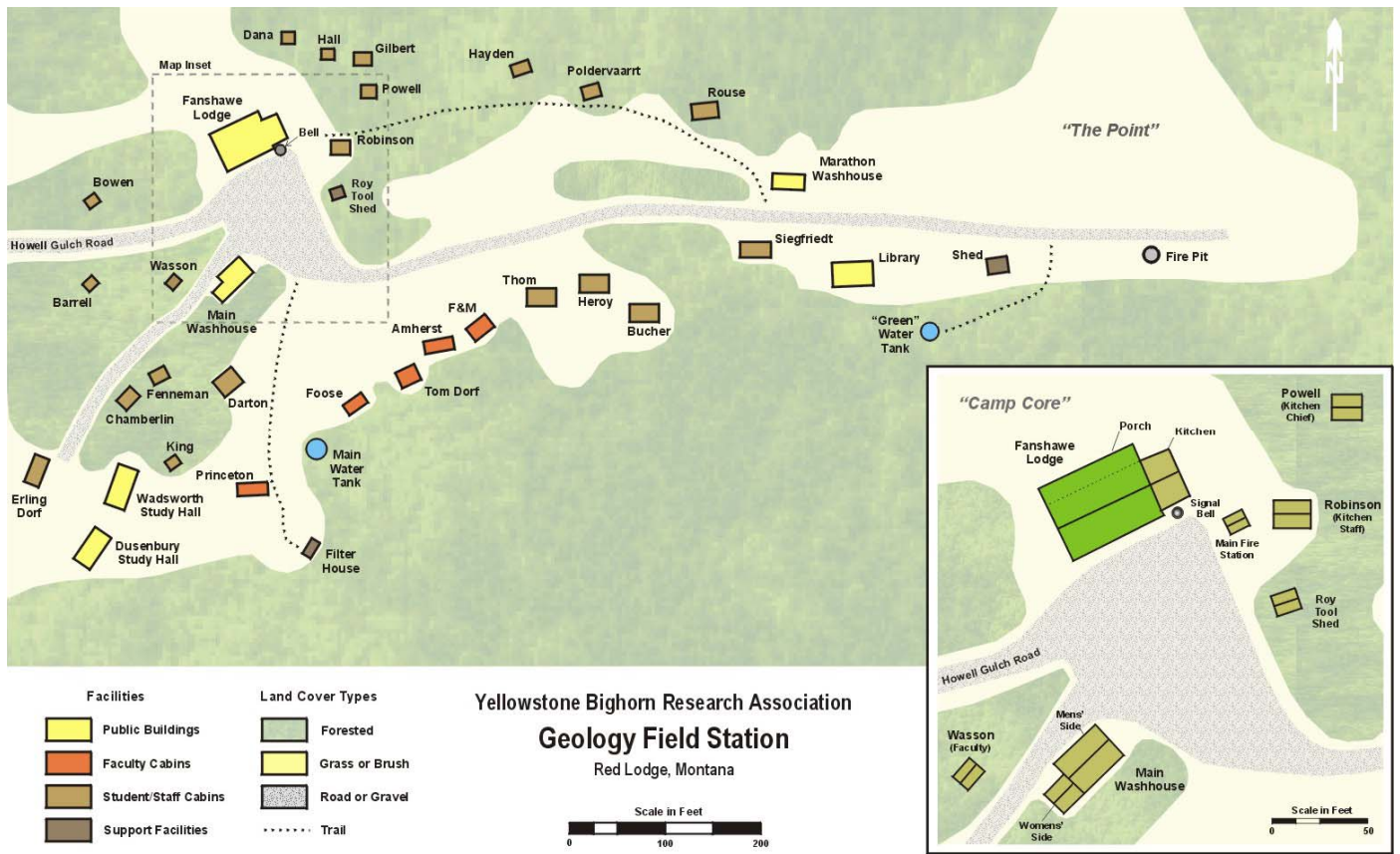
Outside Bucher Dorm



Inside Bucher Dorm



Fanshawe Lodge



Sheep Mountain Anticline, Bighorn



## SUMMER SESSION I

For Advanced Undergraduate Geology Majors  
June 3 – July 8, 2008

Students should register for:

GEOL 3355 – Field Geology I and GEOL 3360 – Field Geology II: (3 credit hours per course, totaling 6 credit hours). For University of Houston majors prerequisites include: GEOL 3145, 3345, 3150, 3350, and 3340. Equivalent or similar courses will be accepted from other colleges and universities with consent of instructors. Field trips required, cost to be defrayed by students. Geological mapping using topographic and aerial photographic base maps, with visits to features of geologic interest. Required courses for B.S. in Geology. GEOL 3355 and GEOL 3360 serve as Capstone courses for UH Geology majors for accreditation purposes.

PREREQUISITE COURSES (or equivalents):

GEOL 3345: Structural Geology (3 CR). Prerequisites: GEOL 3325 and 3340, MATH 1431, PHYS 1301 or 1321, and credit for or concurrent enrollment in GEOL 3145. Properties of earth minerals and their behavior in stress fields; description, classification, and interpretation of geologic structures. Required course for B.S. in Geology and B.S. in Geophysics.

GEOL 3145: Structural Geology Laboratory (3 CR). Prerequisite: credit for or concurrent enrollment in GEOL 3345. Five-day field trip required, cost of which is to be defrayed by students. Techniques for solving problems in structural geology. Required course for B.S. in Geology and B.S. in Geophysics.

GEOL 3350: Principles of Stratigraphy (3 CR). Prerequisites: GEOL 3325 and 3340, and credit for or concurrent enrollment in 3150. Principles of stratigraphy applied to problems of geometry, composition, and time relations of stratified rocks. Required course for B.S. in Geology and B.S. in Geophysics.

GEOL 3150: Principles of Stratigraphy Laboratory (3 CR). Prerequisite: concurrent enrollment in or credit for GEOL 3350. Field trip required, cost of which is to be defrayed by student. Stratigraphic problem solving. Required course for B.S. in Geology and B.S. Geophysics.

## SUMMER SESSION IV

For Beginning or Advanced Geology Majors  
July 8 – August 12, 2008

Advanced students, with the appropriate pre-requisites in Stratigraphy, Structural Geology or equivalent may register for both GEOL 3355 and GEOL 3360. Each course operates on a full six-day week, is graded, and is regarded as equivalent to two full course units, or six semester hours, at participating institutions, similar to Summer Session I. UH students must register for both courses.

Because field training is a desirable experience early in a geologist's career, we also encourage students early in their undergraduate program to take a field course as soon as possible after they have identified their interest in geology. These students may register for GEOL 3355 only as prerequisites are fewer for students desiring a single 3 credit course GEOL 3355. Students with pre-requisites in Physical Geology and Mineralogy or Petrography (or equivalent courses or consent of instructor) may enroll in Session IV for only GEOL 3355 (3 CR). Instruction in basic field techniques, methods and observations are included in Session IV for beginning students. This 3 credit option may also be used for advanced students seeking to transfer only 3 credit hours to their home institutions. Advanced students who have taken Stratigraphy and Structural Geology (or equivalents) and are seeking only 3 credits may register for GEOL 3360. The course also operates on a full six-day week, is graded, and is regarded as equivalent to one full course unit, or three semester hours, at participating institutions.

Students should register for:

GEOL 3355 – Field Geology I and GEOL 3360 – Field Geology II: (3 credit hours per course, totaling 6 credit hours). For University of Houston majors prerequisites include: GEOL 3145, 3345, 3150, 3350, and 3340). Equivalent or similar courses will be accepted from other colleges and universities with consent of instructors. Field trips required, cost to be defrayed by students. Geological mapping using topographic and aerial photographic base maps, with visits to features of geologic interest. Required courses for B.S. in Geology. GEOL 3355 and GEOL 3360 serve as a Capstone course for UH Geology majors for accreditation purposes.

PREREQUISITE COURSES: Beginning students may have taken two or more of the following courses (or equivalent):

GEOL 1330: Physical Geology (3 CR). Principles of geology, emphasis on surface and internal processes of the earth. Required course for B.S. in Geology, B.S. in Geophysics and B.A. in Earth Science.

GEOL 1130: Physical Geology Lab (1 CR). Prerequisite: credit for or concurrent enrollment in GEOL 1330. Weekend field trip may be required; cost to be defrayed by student. Supplementary to lecture; study of minerals, rocks, and maps.

GEOL 3370: Mineralogy (3 CR). Prerequisites: GEOL 1330 and 1130, CHEM 1111 and 1331. Field trips may be required, cost to be defrayed by student. Crystallographic, physical, chemical, and structural properties of minerals. Crystal symmetry and form, stereographic projection, mineral structures and formulae, identification and description of minerals. Required course of B.S. in Geology, B.S. in Geophysics and B.S. in Earth Science.

GEOL 3372: Petrography (3 CR). Prerequisites: GEOL 1330, 1130 and 3370. Field trips may be required, cost to be defrayed by student. Required course for B.S. in Geology, B.S. in Geophysics, B.A. in Earth Science.



*Cross-stratified oolitic bars of the Jurassic Sundance Formation, Bighorn Basin*

## TUITION, FEES and FINANCIAL AID

**TUITION** – The tuition and fees for the field program will depend upon residency status of the student, as well as whether the student is seeking 6 credit hours or 3 credit hours for the summer field program (see Option I through IV below). University of Houston students are required to enroll in six hours as a requirement for the Geology degree. Students from other university and colleges seeking six hours of credit transferred to their programs should register for GEOL 3355 and GEOL 3360 (option I and II below). Beginning students requiring only 3 hours of Field Geology credit to be transferred to their undergraduate program must register for GEOL 3355 during Summer Session IV (option III or IV). Advanced students requiring only 3 credit hours of Field Geology to be transferred to their home institution may apply to either Summer I or Summer IV session and register for GEOL 3360 (option III or IV). The duration of each option (3 or 6 credit hours) and expectations for daily participation is the same in each Summer Session. Non-resident students requiring 6 credit hours to be transferred and who receive scholarships of at least \$1,000 through the University of Houston may qualify for in-state tuition (option I).

**UNIVERSITY FEES** – include administrative and support fees for the course at \$210 for 6 credits and \$105 for 3 credits and field vehicle fee of \$350 to cover the cost of van rentals and fuel during the course of the field camp.

**ROOM AND BOARD** – at the YBRA and University of Montana will be \$674 in 2008. These payments will not include: (1) travel to and from Red Lodge for those who do not travel to the field station from Houston with the course vehicles, and (2) cost of meals during 5 days of camp. Prior experience indicates that students should bring \$200 to buy meals for three field days in Yellowstone National Park, and lunches during eight days in Dillon, MT. Students arriving from other locations may fly into Billings, MT.

**TRANSPORTATION** – Round trip transportation and lodging is available for Session I only from Houston to YBRA at a cost of \$200. The vans leave Houston on the morning of May 30<sup>th</sup> at 7:00AM and arrive at camp late on June 3<sup>rd</sup>. The vans leave camp on the morning of July 8<sup>th</sup> and arrive in

### OPTION I (Texas Resident seeking 6 credit hours). Required for UH Students

Tuition for 6 credit hours	\$ 954.60
University Fee	\$ 210.00
Vehicle Fee	\$ 350.00
Room and Board by YBRA	<u>\$ 674.00</u>
Total Cost	\$2,188.60
With transportation from and to Houston	<u>\$ 200.00</u>
Total Cost with transportation	\$2,388.60
With University Health Insurance	<u>\$ 425.00</u>
Total Cost with insurance	\$2,813.60

### OPTION III (Texas Resident seeking 3 credit hours)

Tuition for 6 credit hours	\$ 477.30
University Fee	\$ 105.00
Vehicle Fee	\$ 350.00
Room and Board by YBRA	<u>\$ 674.00</u>
Total Cost	\$1,606.30
With transportation from and to Houston	<u>\$ 200.00</u>
Total Cost with transportation	\$1,806.30
With University Health Insurance	<u>\$ 425.00</u>
Total Cost with insurance	\$2,230.30

Houston late afternoon of July 10<sup>th</sup>. The fee includes campground fees and two nights' lodging during the trip, one night's lodging going to the camp and one night lodging on the return trip. One-way travel on the vans cost \$110.

Students may also drive their personal vehicles to the field camp. In the future, we'll be adding some suggested travel routes of scenic and scientific interest for those who drive their own vehicles. Students may also fly to Billings Montana. Students must make arrangements to get from the airport or bus station to Camp, and arrive on June 3<sup>rd</sup> and depart in the morning of June 8<sup>th</sup>. Session IV students must arrive on July 8<sup>th</sup> and depart on August 12<sup>th</sup>.

**HEALTH INSURANCE** – The University of Houston requires all students to carry health insurance while at the field camp at a cost of \$450 for the semester. This cost can be waived if the student can show proof of their own personal health insurance during the period that the field course will be conducted.

**FINANCIAL AID** – is not available directly from the course, except for students who attend University of Houston and who qualify for financial aid from the University of Houston or UH Alumni Scholarship. Some students from other institutions who would ordinarily qualify for financial aid on the basis of need have been able to transfer part of their financial aid packages from their home institutions; other have been able to acquire scholarship or loans from their home institution. Each applicant is encouraged to contact his or her financial aid officer for more information.

**SCHOLARSHIPS** – The National Association of Geology Teachers (NAGT) offers partial financial assistance (\$500) for field camp participants. Applications for NAGT scholarships are available at [www.nagt.org/field.html](http://www.nagt.org/field.html). Scholarships that are over \$1000 and awarded to non-Texas residents through the University of Houston may qualify students for in-state tuition. This includes students from other institutions, provided the sponsor funds the scholarships through the University of Houston.

### OPTION II (non-Texas Resident seeking 6 credit hours). Rq'd for UH Students

Tuition for 6 credit hours	\$2,622.60
University Fee	\$ 210.00
Vehicle Fee	\$ 350.00
Room and Board by YBRA	<u>\$ 674.00</u>
Total Cost	\$3,856.60
With transportation from and to Houston	<u>\$ 200.00</u>
Total Cost with transportation	\$4,056.60
With University Health Insurance	<u>\$ 425.00</u>
Total Cost with insurance	\$4,281.60

### OPTION IV (non-Texas Resident seeking 3 credit hours)

Tuition for 6 credit hours	\$1,311.30
University Fee	\$ 105.00
Vehicle Fee	\$ 350.00
Room and Board by YBRA	<u>\$ 674.00</u>
Total Cost	\$2,440.30
With transportation from and to Houston	<u>\$ 200.00</u>
Total Cost with transportation	\$2,640.30
With University Health Insurance	<u>\$ 425.00</u>
Total Cost with insurance	\$3,065.30

## ADMISSION

The attached application form, signed by the applicant and a faculty member or academic advisor from the applicant's department should be post-marked by March 1, 2008, for full consideration for 2008 admission. (Online application is also available on our website at [www.geosc.uh.edu](http://www.geosc.uh.edu)) Offers of admission for qualified students will be emailed as reviewed and accepted, but typically no later than March 15<sup>th</sup>. Early applications are advised to assure preference of Summer Session I or IV. Although preference for Summer Session I or IV will be considered, admission to enter session will be based on a combination of housing, total enrollment, qualifications of the student, and application submission date. Late applications will be considered only if the student is highly qualified, and if the sessions are not fully filled. Questions about applications, admission process and late admission possibilities should be addressed to:

Dr. Virginia Sisson, Director  
University of Houston – YBRA Field Camp  
Department of Geosciences  
312 Sciences and Research Building 1  
Houston, Texas 77204-5007  
Telephone: (713) 743-3399  
Email: [jsisson@uh.edu](mailto:jsisson@uh.edu)

Tram Nguyen, External Programs Coordinator  
University of Houston – YBRA Field Camp  
Department of Geosciences  
312 Science and Research Building 1  
Houston, Texas 77204-5007  
Telephone: (713) 743-3853  
Email: [tnguye36@mail.uh.edu](mailto:tnguye36@mail.uh.edu)

For more information about the University of Houston, Department of Geosciences, please visit [www.geosc.uh.edu](http://www.geosc.uh.edu)

**UNIVERSITY OF HOUSTON – YBRA PROGRAM  
GEOLOGIC FIELD METHODS  
2008 SUMMER PROGRAM**

**FOR OFFICIAL USE ONLY**

Received on:

- .....
- Complete Application
- Approve
- Disapprove

**APPLICATION**

Session I: Advanced Field Geology (June 3 – July 8, 2008)  
Session IV: Field Geology (July 8 – August 12, 2008)

1. Name: (last, first, middle)		2. Date of Birth: (mm/dd/yyyy)		3. Gender <input type="checkbox"/> Female <input type="checkbox"/> Male	
4. University/College of Current Enrollment:			5. Expected Graduation Date:		
6. Status (as of June 2008): <input type="checkbox"/> Freshman <input type="checkbox"/> Sophomore <input type="checkbox"/> Junior <input type="checkbox"/> Senior <input type="checkbox"/> Graduate			7. How will you travel to camp site? <input type="checkbox"/> I will make my own travel arrangement <input type="checkbox"/> I will use UH-arranged transportation (additional fees required)		
8. Mailing Address:				9. Telephone:	
11. Permanent Address: (if not same as above)				10. Alternative Telephone:	
13. Email Address:				12. Emergency Contact: Name: ..... Relationship:..... Telephone:.....	
14. Major:		15. If not "Geosciences" Major, reason for applying:		16. Cumulative GPA:	
17. List courses you have taken or are taking in Earth Sciences (use a separate sheet if necessary)				18. Please indicate the course(s) you plan to enroll for the 2008 Summer Program	
Course Name		Grade	If no grade, completed by June 2008?		<input type="checkbox"/> GEOL 3355 only (Session IV) <input type="checkbox"/> GEOL 3360 only (Session I) <input type="checkbox"/> GEOL 3360 only (Session IV) <input type="checkbox"/> <b>Both</b> GEOL 3355 and 3360 (Session I) <input type="checkbox"/> <b>Both</b> GEOL 3355 and 3360 (Session IV)
19. Do you have a physical or medical condition that might limit your ability to participate in the normal but often strenuous activities of a geology field course, such as hiking, climbing, camping, etc? If your answer is "yes", you must provide a letter from parent, guardian, or doctor describing that condition and explaining why it will not interfere with your participation in this field course.  <input type="checkbox"/> Yes, I am including with this application a letter from a parent, guardian or doctor. <input type="checkbox"/> No				20. Provide the name of your insurance provider:	
Signature of faculty member from your institution recommending admission or an academic advisor, and who can verify the accuracy of all grades reported on this application  ..... Date			Signature of Applicant  ..... Date		
Name:		Title:		By signing, applicant certifies that all the above information is true and correct to the best of his or her knowledge.	
Email Address:					

Please send this application form along with: (1) an official copy of undergraduate transcript, and (2) proof of insurance, either by regular mail or by email to:

University of Houston – YBRA Field Course  
Department of Geosciences  
312 Science and Research Building 1  
Houston, Texas 77204-5007  
Attention: Tram Nguyen  
Email: tnguye36@mail.uh.edu

All applications for 2008 Summer Program must be post-marked no later than March 1, 2008.