

# Iceland: Geology & Natural History of a Young Island

GEOL 180

Lafayette College

August 2-21, 2017



Lake Myvatn, Northern Iceland. (National Geographic)

## Instructors:

Drs. T. Carley, L. Malinconico  
& D. Sunderlin

**Room/Lab:** Lafayette campus & the landscapes of Iceland

**Lecture & Lab:** Full field days and evening discussions.

**Email:** [carleyt@lafayette.edu](mailto:carleyt@lafayette.edu), [malincol@lafayette.edu](mailto:malincol@lafayette.edu) & [sunderld@lafayette.edu](mailto:sunderld@lafayette.edu)

\*In compliance with Lafayette College policy and equal access laws, the instructors are available to discuss appropriate academic accommodations that you may require as a student with a disability. Requests for academic accommodations need to be made prior to the course start date in August 2017, except for unusual circumstances, so arrangements can be made. Students must register with the Office of the Dean of the College for disability verification and for determination of reasonable academic accommodations.

## COURSE DESCRIPTION:

Iceland is a geologically new and unique island. The dynamic glacial environments, sub-polar climate, and thunderous river systems of the country sit atop an active volcanic system on a divergent plate boundary. This intensive field course explores the geological processes that shape the island's landscape and the climate and life of a sub-polar biome. The course also addresses aspects of Iceland's human ecology from its early settlement to modern issues of energy, agriculture, and sustainability.

## COURSE LEARNING OUTCOMES:

Students will be able to:

1. understand the geologic setting of Iceland within the context of global plate tectonics.
2. describe the volcanic and earth surface processes that shape the unique landscape of Iceland and understand the interactions between the various processes.
3. discuss the numerous geologic hazards that result from the dynamic tectonic environment in Iceland including mitigation and preparation efforts.
4. explain the fundamentals of atmospheric and oceanographic processes that act on the region's climate and life.
5. describe early and modern relationships of humans to the environment and ecology of Iceland in the context of energy, agriculture, and sustainability.

## COURSE COMPONENTS

### Texts

*Volcanoes*, Decker & Decker, Freeman Press

*The Dynamic Earth*, USGS (pdf & online text)

*Chasing Ice*, documentary film

Geologic map of Iceland

Readings Packet (to be provided by the instructors):

Island ecology & biogeography articles

Iceland volcanology, glaciology, & climate articles

Selected Icelandic sagas & history readings

John McPhee "Cooling the Lava"

### Evaluation

This course will be evaluated in a fashion similar to 100-level on-campus geology courses. Evaluation will include:

- one Pre-Course Assignment
  - This pre-course assignment will focus on general geology and geography. It will be due upon your arrival on campus in August.
- one Pre-Departure Exam
  - This first exam will occur before departure in August and will cover material that is summarized during on-campus discussion both in the Spring of 2017 and in the day and a half of classes before departure to Iceland.
- one Mid-Course Exam
  - The mid-course examination will cover material from the field portions of the course in Southern Iceland.
- one Final Exam
  - The final exam will be comprehensive for the entire course but concentrate on the Northern Iceland field component.
- A detailed Field Journal (in the style & spirit of intrepid naturalists). Taking field notes, recording field data, and writing reflection entries is all part of the Field Journal for the course.

You will need your journal (and a pencil) with you **constantly** and do all that you can to insure that it is not lost. The journal will be assessed periodically for completeness, depth of observations, and neatness. The journal is the primary means of studying for examinations as well.

### GRADING BREAKDOWN:

Pre-Course Assignment:	10%
Pre-Departure Exam:	20%
Mid Course Exam:	20%
Final Exam:	25%
Field Journal (evaluated at least 3 times during the course):	15%
Participation:	10%

### **College Policy on Academic Integrity**

To maintain the scholarly standards of the College and, equally important, the personal ethical standards of our students, it is essential that written assignments be a student's own work, just as is expected in examinations and class participation. A student who commits academic dishonesty is subject to a range of penalties, including suspension or expulsion. Finally, the underlying principle is one of intellectual honesty. If a person is to have the self-respect and the respect of others, all work must be his/her own.

### **Behavior**

You are representing Lafayette College while you are on- and off-campus. All participants must comply with Lafayette's rules, standards, and instructions for student behavior as defined in the College's Code of Conduct and the office of International and Off-campus Education. Lafayette reserves the right to enforce culturally appropriate standards of conduct in another country and specifically reserves the right to terminate the participation of any student for failure to maintain these standards or for any actions of conduct which Lafayette considers to be incompatible with the interest, harmony, comfort, or welfare of other participants. Since we will be in conditions where alcohol can exacerbate already physiologically demanding situations, we will require that you adhere to a strict no-alcohol consumption policy while a participant in this course, even if you are of legal age. Actions and unacceptable behavior will not be tolerated and could result in you being returned to Lafayette. Should your participation in the program be terminated either by the host institution or by Lafayette College for reasons of misconduct, you will receive neither credit nor refund.

### **Federal Credit Hour Compliance**

The student work in this course is in full compliance with the federal definition of a four credit hour course. Please see the Registrar's Office website (<http://registrar.lafayette.edu/additional-resources/cep-course-proposal/>) for the full policy and practice statement.

## COURSE SCHEDULE

Date	General Whereabouts	Academic Themes	Logistical Notes
<i>Spring 2017</i>	<i>Van Wickle Hall</i>	<i>4 hours of planning and learning activities in preparation for the course</i>	
<b>8/2 Wed</b>	<b>Van Wickle Hall</b>	Volcanism & Climate Lectures	Course begins at 9AM in VW 108 Class from 9-12 Lunch provided Class from 1-5 Dinner provided Class from 6:30-9PM Overnight in LC dorms
<b>8/3 Thur</b>	<b>Van Wickle Hall &amp; Fly from Newark to Reykjavik</b>	Glaciology & Ecology/Evolution Lectures	Breakfast provided Class from 8AM-12PM <b>Lunch on own</b> <b>PRE-DEPARTURE EXAM</b> in the afternoon <b>Dinner on own</b> Overnight flight to Iceland
<b>8/4 Fri</b>	<b>Southwestern Iceland Reykjanes Peninsula</b>	Tectonics, Volcanism, and Groundwater Hydrology	AM arrival into Iceland Breakfast included Bridge of 2 continents/ Gunnuhver Geothermal Field lunch included Transfer to Hotel Class Meeting <b>Dinner on own</b> Overnight in Reykjavik (Centerhotel Plaza)
<b>8/5 Sat</b>	<b>Southwestern Iceland Reykjavik and surroundings</b>	Volcanic Rocks & Geothermal Energy	Breakfast included at Centerhotel Plaza Leidarendi lava tube excursion Field lunch included Reykjadalla geothermal hike <b>Dinner on own</b> Overnight in Reykjavik (Centerhotel Plaza)
<b>8/6 Sun</b>	<b>Western Iceland</b>	Volcanic Stratigraphy, Geomorphology, & Archeology	Breakfast Included at Centerhotel Plaza Field exercise - stacked lava flows Deldartunguhver thermal springs Hraunfossar River/pahoehoe flows Field lunch included Grabrok Crater & Vatnskalsholar landslide Dinner included Overnight at Gauksmyri
<b>8/7 Mon</b>	<b>Northern Iceland Akureyri</b>	Structural Geology & Soil Science	Breakfast included at Gauksmyri Hvitserkur Sea Stacks/glacial landscapes Fault field exercise Field lunch included Roadside geology stops into Akureyri <b>Dinner on own</b> in Akureyri Overnight near Akureyri (Sveinbjarnargerdi)
<b>8/8 Tues</b>	<b>Northern Iceland Myvatn Area</b>	Geomorphology & Phreato-magmatism	Breakfast included at Sveinbjarnargerdi Godafoss waterfall/Viti Crater/Krafla Field lunch included Hvirer Geothermal Field Hverfjall Maar- & rootless cones - Myvatn Dinner included Overnight in Myvatn (Hotel Sel)

Draft Syllabus (TENTATIVE) (subject to change)

<b>8/9 Wed</b>	<b>Northern Iceland</b> Myvatn Area	Volcanism, Hydrology, & Geothermal Energy	Breakfast included at Hotel Sel Excursion to 2015 eruption site Field lunch included Askja Caldera/Crater Hike Nature Baths near Myvatn Dinner included Overnight in Myvatn (Hotel Sel)
<b>8/10 Thur</b>	<b>Northern Iceland</b> Husavik Area	Paleontology & Geomorphology	Breakfast included at Hotel Sel Husavik Fossils Field lunch included Asbyrgi/Dettifoss Vesturdalr Hljadaketar Intrusives Dinner included Overnight in Myvatn (Hotel Sel)
<b>8/11 Fri</b>	<b>Northeast Iceland</b> Highland Traverse	Mountain Climatology & Glacial Erosion	Breakfast included at Hotel Sel Glacial geology on way to Egilsstadir Field lunch included <b>Exam</b> Dinner included Overnight at Guesthouse Egilsstadir
<b>8/12 Sat</b>	<b>Eastern Iceland</b> Fjordlands	Intrusive Processes & Products	Breakfast included at Guesthouse Egilsstadir Dikes at Djupivorgur Lunch included Xenoliths/Rhyolites/Granites/Magma Mixing at Eystrahorn Dinner included Overnight in Hofn (Smyrlaborg)
<b>8/13 Sun</b>	<b>Southeastern Iceland</b> Skaftafell National Park	Glaciology & Ecology	Breakfast included at Smyrlaborg Jokulsarlon & Hike at Svinafellsjokul Field lunch included Glacial products study Dinner included Overnight in Skaftafell area (Hof 1)
<b>8/14 Mon</b>	<b>Southern Iceland</b> Skaftafell National Park	Glaciology & Biogeography	Breakfast included at Hof 1 Skaftafellsjokul Field mapping of glacial moraines Field lunch included Svartifoss Dinner included Overnight in Skaftafell area (Hof 1)
<b>8/15 Tues</b>	<b>Southern Iceland</b> Lakagigar	Recent Volcanism	Breakfast included at Hof 1 Lakagigar excursion all day - type location for Icelandic fissure eruptions Field lunch included Dinner included Overnight in Laki area (Fosshotel Nupar)
<b>8/16 Wed</b>	<b>Southern Iceland</b> South Coast	Sedimentology, Agriculture, & Oceanography	Breakfast included at Fosshotel Nupar Dverhgamrar & Kirkjugolf Columnar jointing, top, bottom & sides Black sand beach & field exercise Field lunch included Eyafjallajokull eruption museum Skogafoss Dinner included Overnight at Hotel Skogafoss

<b>8/17 Thur</b>	<b>Southern Iceland</b> Thorsmork National Park	Glaciology, Geomorphology, & Ecology	Breakfast included at Hotel Skogafoss Thorsmork excursion all day Breached glacial lakes. Glacial flow banding Field lunch included Dinner included Overnight at Hotel Skogafoss
<b>8/18 Fri</b>	<b>Westman Islands</b> Heimaey & surroundings	Volcanism, Ornithology, & Biogeography	Breakfast included at Hotel Skogafoss Ferry to Vestmannaeyjar Lava flow mitigation discussion Field lunch included Heimaey Museum and Eldfell Dinner included Overnight in Heimaey (Hotel Vestmannaeyjar)
<b>8/19 Sat</b>	<b>Southwestern Iceland</b> Thingvellir Area	Icelandic History, Culture, and Tectonics	Breakfast included at Hotel Vestmannaeyjar Selfoss, Thingvellir National Park Greenhouse lunch included Geysir, Gullfoss <b>Dinner on own</b> Overnight in Reykjavik (Centerhotel Plaza)
<b>8/20 Sun</b>	<b>Southwestern Iceland</b> Reykjavik City	Study Day	Breakfast included at hotel Hellisheidi power plant tour <b>Lunch on own</b> Study Time in Reykjavik <b>Dinner on own</b> Overnight in Reykjavik (Centerhotel Plaza)
<b>8/21 Mon</b>	<b>Southwestern Iceland</b> Reykjavik City		Breakfast included at Centerhotel Plaza Study Time in Reykjavik <b>FINAL EXAM (in Library) 9-11AM</b> <b>Lunch on own</b> Transfer to KEF for flight <b>Dinner on own</b> Overnight at Lafayette College

The schedule of activities above is subject to change due to weather, traffic, road conditions, and other logistical concerns. Please remain flexible as we attempt to provide the best educational experience while keeping safety first.