

# Lighthouse School

## Syllabus

Course Title: Geology of SE Prince William Sound and Kayak Island

Dates: June 2 – June 16<sup>th</sup> 2007

Contact Hours: 120

Prerequisite: 2.5 GPA 10<sup>th</sup> – 12<sup>th</sup> grade standing.

### Texts:

- Geology of Prince William Sound by Jim Lethcoe,
- Where the Sea breaks its Back by Corey Ford and Lois Darling,
- Peterson First guide to rocks and Minerals by Fredrick H. Pough

### Description:

This course is a holistic, experiential leap into the science of Geology. Students will be prepared with a large amount of background information before the trip. The field course will be characterized as a high paced intensive where all of the relevant fields of geology will be incorporated. The ultimate goal of this class is to develop students who have both the background and the skills needed to effectively interpret the geologic history of any place on earth.

Students will be able to Describe (Content)	Students will be able to Do (Skills)
Continental Drift	Calculate the Epicenter of an Earthquake
Plate Tectonic Theory and plate boundaries	Draw folds and faults in 3-D
Terranes of Southern Alaska	Describe the orientation of a structure on a map using strike and dip symbols.
Hotspots and measuring plate motion	Identify a geologic structure and its properties in the field.
The physics of earthquakes	Identify Minerals in hand sample
Minerals and their environments of formation	Use techniques panning and prospecting identify possible mineral locations.
Mineral exploration	Identify Sedimentary rocks in hand sample and determine a probable environment of deposition.
Weathering – physical and chemical	Identify features that indicate glacial history in the field.
Rivers – how running water erodes transports and deposits sediment.	Identify the parts of a glacier in the field.
Glaciers – How they work, the types of glaciers, and the features that indicate glacial history.	Classify describe rivers and their history in the field
Glaciers and climate change	Identify Igneous rocks in hand sample and determine a probable tectonic setting for its formation.
Erosion and deposition by wind	Identify Metamorphic rocks in hand sample and determine a probable parent rock.
Sedimentary Rocks and sedimentary structures.	Determine the age of rock sample using the concept of half lives.
Igneous rocks and volcanoes	Identify common fossils specific to Kayak Island
Types of volcanoes and associated lavas.	
Metamorphic Rocks and Metamorphism	
Structural Geology – stress, strain, folding, and faulting	
Geologic time, the fossil record, and radioactive dating	
Geological History of Prince William Sound and Southern Alaska	

Methods:

Pre Course

May 1 – June 2

Independent Reading – Geology of Prince William Sound by Jim Lethcoe, Where the Sea breaks its Back by Corey Ford and Lois Darling, and Peterson First guide to rocks and Minerals by Fredrick H. Pough

Assessment – Online forum through website.

June 2 – 16

Lectures, Field Trips, and lab work.

Assessment – Students will create their own hand written text on Geology. In the spirit of Steller, Darwin, Humboldt, Powell, and many of the great explorers and naturalists, students will carefully record their observations about geology in their book. They will be assessed upon the completeness, and accuracy of the information they have recorded.

Post Course

June 16 – June 30

Final summative paper on the Geology of Kayak Island

