

## Department of Geological Sciences

### Independent Study Guidelines

#### **Purpose of Independent Study**

Independent Study is an opportunity to earn academic credit for learning outside the formal classroom structure, with individual direction from a faculty member on a topic of mutual interest. A student who is interested in learning more about a topic not covered in the regular curriculum may propose to investigate and research a topic under the guidance of any member of the regular faculty. However, faculty members are not required to offer Independent Study instruction and will do so only if the topic is of interest and if their schedule permits. The student has the responsibility for proposing a topic to the instructor, but the instructor must ensure that the topic is approached in a structured manner and in keeping with academic standards of the program. Independent Study may not be used to substitute for a regular course not being offered in a given term; students should seek Individualized Instruction through Continuing Education for this purpose.

#### **Proper uses of Independent Study**

Most independent study projects are performed on campus and under the direct supervision of a qualified sponsor including literature review and laboratory-related projects. Field or museum work done off campus may also be acceptable if the work is completed with the guidance of a qualified sponsor and is germane to the independent study topic.

The College prohibits independent study for the following purposes:

1. Internship experiences
2. Work in a university department
3. Substitute for regular course work
4. To meet College List, Core, or MAPS requirements
5. Work completed elsewhere (unless approved by department before initiating the project, at department discretion)
6. Volunteer work (can be acceptable if work is part of and germane to the rest of the independent study project)
7. Work in business (can be acceptable if work is part of and germane to the rest of the independent study project)
8. Extra work performed in association with a regular class (can be acceptable if all procedures in setting up the independent study are followed prior to the work being started)

#### **Description of the Contract**

In addition to describing a topic and the expected results (e.g., paper, presentation, etc.), providing a rationale, and outlining evaluation procedures, the student should be aware that a minimum of 25 hours of time is required for one semester hour of credit. These hours will consist mostly of time spent by the student on their own, carrying out assignments and research as recommended by the instructor. However, students must also meet on a regular basis with the instructor. Typically, one hour per week for the duration of the semester is a minimum for a three-credit hour course. The student should present a draft of the Independent

Study form to the instructor for approval at least one week before the add deadline each semester. The rationale should explain as fully as possible why this course needs to be given as Independent Study.

### **Credit Hours:**

Each independent study is worth between one to three hours of credit per semester; the exact amount is determined by CCHE policy (25 hours of effort per one semester hour of credit). A maximum of 16 hours towards the degree may be taken as independent study; eight in any one department; six in any single semester. College rules do not allow independent study for College list, core or MAPS curriculum requirements. For graduate students, independent study courses cannot exceed 25% of the course work required by the department. A student may take no more than three semester hours of independent study in Geology in any one semester.

### **Eligibility:**

Independent study in Geological Sciences is available to all undergraduate and graduate students.

Graduate students must have a GPA of 3.3 or higher to be eligible.

At the undergraduate level, the student must be able to demonstrate sufficient background in their topic to make their project meaningful. There are no specific course requirements to determine eligibility, it is at the discretion of the individual instructor. Undergraduate students must have completed at least 60 semester credit hours and have an overall GPA of 2.7 or higher to be eligible.

### **Procedures:**

To enroll in independent study:

1. Student proposes their topic to a faculty sponsor and requests that they mentor them for an independent study.
2. Student reviews the independent study rules and regulations.
3. Student and instructor complete their respective portions of the Independent Study application.
4. The Associate Chair for Undergraduate/Graduate studies reviews the proposal and approves or denies the application.
  - a. If approved, the application is forwarded to the Undergraduate/Graduate Program Administrator to register the student for the course.
  - b. If denied, the application is returned to the student and instructor with an explanation of the denial. If appropriate, a revised application may be submitted by the student and instructor.

The independent study application must be approved prior to the first day of classes in the semester when the independent study will occur. Student should submit the application to their faculty mentor no later than two weeks prior to the first day of classes. An independent study may not be added after ten days into the semester – no exceptions. No Independent Study Contracts will be approved after the work has begun or after the work has been completed.

### **Qualified Sponsors**

All regular faculty and research professors in the Department are qualified sponsors (instructors) of independent study. Their names and general areas of interest are provided in appendix A. Some adjunct, adjunct, attendant-rank and instructors can also supervise if they are listed in appendix A.

## Appendix A: Qualified Sponsors

• Lon Abbott	Geoscience Education, Structure, and Tectonics
• Bob Anderson	Geomorphology and Cryosphere, Geochronology, Global Change
• Suzanne Anderson	Geomorphology and Cryosphere, Hydrology
• Leilani Arthurs	Geoscience Education, Hydrogeology, Geochemistry, Natural Hazards
• Aaron Bell	Petrology
• Karen Chin	Paleontology and Paleobiology, Geobiology
• Alisha Clark	Petrology & Mineralogy, Cosmochemistry & Planetary Geology
• Carolyn Crow	Cosmochemistry & Planetary Geology, Geochronology, Thermochronology
• Jaelyn Eberle	Vertebrate Paleontology and Paleobiology
• Lang Farmer	Geochemistry, Petrology, Sedimentology & Stratigraphy
• Rebecca Flowers	Geochronology, Structure and Tectonics, Mineral Physics & Mineralogy
• Shemin Ge	Hydrogeology, Economic and Energy Resources, Natural Hazards
• Brian Hynek	Cosmochemistry & Planetary Geology, Astrobiology, Geochemistry
• Craig Jones	Geodynamics, Geophysics, and Remote Sensing, Structure and Tectonics
• Sebastian Kopf	Geobiology, Geochemistry, Astrobiology
• Kevin Mahan	Structure and Tectonics, Petrology & Mineralogy, Geodynamics, Geophysics
• Tom Marchitto	Paleoclimate and Paleoceanography, Geochemistry, Geochronology
• Brad Markle	Climate Indicators, Cryosphere, Paleoclimate
• Kathryn Materna	Geodynamics, Geophysics, and Remote Sensing, Natural Hazards, Structure
• Karl Mueller	Structure & Tectonics, Natural Hazards, Planetary Geology
• Irina Overeem	Sedimentology, Geomorphology and Cryosphere, Global Change
• Shaily Rahman	Biogeochemistry, Chemical Oceanography
• Vera Schulte-Pelkum	Tectonics
• Julio Sepúlveda	Geochemistry, Paleoclimate and Paleoceanography, Geobiology
• Anne Sheehan	Geodynamics, Geophysics, and Remote Sensing, Natural Hazards, Structure
• Carl Simpson	Paleobiology and Paleontology
• Eric Small	Hydrology, Geodynamics, Geophysics, and Remote Sensing, Geomorphology
• Katie Snell	Paleoclimate & Paleoceanography, Geochemistry, Sedimentology & Stratigraphy
• Jennifer Stempien	Earth Science Education, Paleontology & Paleobiology
• Alexis Templeton	Geobiology & Astrobiology, Geochemistry
• Kristy Tiampo	Geodynamics, Geophysics, and Remote Sensing, Natural Hazards
• Lizzy Trower	Sedimentology & Stratigraphy, Geobiology
• Greg Tucker	Geomorphology and Cryosphere, Hydrology
• Boswell Wing	Geobiology & Astrobiology, Geochemistry

## Department of Geological Sciences

### Undergraduate Independent Study Application

The following application must be completed and approved in order to register for an undergraduate-level independent study course (GEOL 4862). Please review the independent study guidelines before completing this form. Note: your application must be submitted at least two weeks before the first day of classes and approved prior to the first day of classes in the semester in which it is to be completed. Please direct all questions to geoupa@colorado.edu.

#### **\*\*Student Section\*\***

Student Name: Kieran Stone Student Email Address: kieran.stone@colorado.edu  
Instructor Name: Bradley Markle Instructor Email Address: bradley.markle@colorado.edu  
Total credit hours completed toward degree: 13.00 Overall GPA: 3.59  
Total prior independent study credit hours: 0.00

Briefly describe the subject of your independent study (i.e., the topic to be researched):

Building a shallow ice approximation of model of the South Cascade Glacier

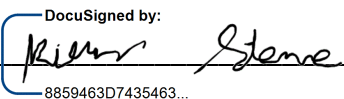
List any previously completed GEOL courses that are applicable to this project:

GEOL4241: Principles of Geomorphology, GEOL3600: Intro Python Earth Sci, GEOL4725: Snow Hydrology

Please describe the procedures to be followed in the investigation. Be specific. Please include the location where the study will take place if it is not the Boulder main campus.

I will work to build a shallow ice approximation of the South Cascade Glacier. I will use topography data to construct a 1D bed, and temperature and precipitation data to construct a mass balance model that will be applied to the shallow ice approximation model. The work will take place on the Boulder main campus.

*I have read and understand the independent study guidelines and agree to abide by the rules and requirements set forth in the document:*

Student Signature:  Date: 11/15/2024

**\*\*Instructor Section\*\***

*I have read and understand the independent study guidelines and agree to abide by the rules and requirements set forth in the document:* DS (Initials)

How will student performance be evaluated? What specific accomplishments are expected of the student?

The student will be evaluated on the completion of the final project, a model of the South Cascade glacier. The goal is the student gaining knowledge in the field of glacier modeling, so progress towards this goal will be evaluated in the building of the model.

What is the final due date for all work to be completed? last day of semester (no later than last day of the semester)

How many hours per week do you expect the student to devote to the project? equivalent of 2 credit hours

How many hours per month will you meet with the student about this project? student to send wkly updates, meet as need

Total credit hour request (25 hours of student effort is equivalent to one credit hour): 2

How has the applicant demonstrated the ability and background to perform the proposed study?

The student has already shown a significant amount of research and reading in the area and has begun assembling the information needed for this project.

**\*\*Instructor and Program Approvals\*\***

*Instructor and program approval is required for all independent study courses in Geological Sciences.*

DocuSigned by:

Bradley Markle

11/17/2024

Instructor

Date

Associate Chair

Date

**\*\* Front Office Use Only\*\***

*Eligibility Check* Overall GPA: \_\_\_\_\_ Credit hours to date: \_\_\_\_\_ # of prior IS credits: \_\_\_\_\_

Registered By: \_\_\_\_\_ Date: \_\_\_\_\_ Course and Section #: \_\_\_\_\_ Credit hours: \_\_\_\_\_