

# SUSTAINABILITY INFUSION PROJECT

## ELEMENTS OF PHYSICAL GEOGRAPHY 155

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#### Title of Module/Activity

Topic Examinations of Sustainability and/or Resilience Within the Four Spheres of Physical Geography

#### Course Name and Course Number

Elements of Physical Geography; Geography 155

#### Length of Module/Activity

Integrated into current lectures, coursework and four new semester long stand-alone group interaction projects and a final group audiovisual project.

#### Primary Learning Outcomes

In phase one students will demonstrate their comprehension of the Four Spheres of Geography by relating, illustrating and summarizing the in-class group exercises. They will then need to apply, synthesize and evaluate a subset of one of the lessons in their group audiovisual presentation. This process will call upon them to research and organize their theme in a logical manner. Then they will need to develop and implement a plan that can elaborate and visualize their findings. Finally, they will have to defend their findings and prove why they presented the opinions and conclusions they have reached.

#### Resilience and/or Sustainability Connections

As the planet begins to exhibit the advanced impacts of climate change upon all aspects of the physical world, those impacts are being felt across the four spheres of geography. These impacts are testing the sustainability of systems large and small that will determine how humans will live in the future. Students will be instructed to examine how this interaction of climate impacts will challenge the resilience and potentially the sustainability of specific issue, group, region, or connections between these.

#### Identify One or More of the Key Sustainability Competencies Addressed

Students will address all five of the Wiek et al. (2011, 2016) sustainability competencies (Futures thinking (or anticipatory) competence; Values thinking (or normative) competence; Strategic thinking (or action-oriented) competence; Collaboration (or interpersonal) competence and the fifth competence, Systems Thinking.

## Instructional Strategies

New lectures will be added that focus on sustainability and resilience in relation to the four Earth systems spheres (Hydrosphere, Lithosphere, Atmosphere, Biosphere) and processes. Material for the lectures will come from the Carleton Educators website, the Pearson MyLab Mastering Geography website and the PhysicalGeography.net Fundamentals website.

Embedded in the lectures will be content quizzes that will help guide students towards important aspects of climate change and its impact on the sustainability and resilience of the four Earth sphere systems.

Students will complete the Earth Spheres lab exercises from the Carleton Earth Labs for Educators website during one in class session and outside group meetings. Lecture breakout sessions will be proctored by the instructor and the four laboratory teaching assistants.

This will cover 8 weeks of the semester leaving the students four weeks to complete an audiovisual presentation for the Course Gallery Walk. These presentations will be based on a specific aspect of an earth system or process in detail and how it works from the aspect of the interaction of the Four Earth System Spheres.

## Assessment Strategy

There will be three assessment strategies used for the three phases of the project.

The in-class quizzes will be presented during the lecture using the TopHat presentation program. The quizzes will be graded and tabulated automatically, and the answers given immediately following the quiz. The quiz questions will then also be placed in a file on the course Canvas page for the students for them to refer to during the completion of their class group exercises and the group audiovisual project.

The in-class exercises will be graded based upon the instructor's answer guide and upon the [We-Impact Teamwork Rubric](#). The rubric grading will be based upon observations conducted by the TA's and the course instructor. In addition the students will grade each other based upon the WIT teamwork rubric.

The Gallery Walk audiovisual presentations will be graded using a customized version of the [KQED Science Media Making rubric](#). In addition the students will grade each other based upon the WIT teamwork rubric.