**Mohawk Valley Community College**

**Utica, New York**

**Course Outline**

**Earth Science for Childhood Education Majors**

**GL 202**

**REVIEWED & FOUND ACCEPTABLE 5/12/17**

**Course Outline**

**Course Number:** GL 202

**Course Title:** Earth Science for Childhood Education Majors

**Credit Hours:** 4

 **I. Course Description**

This course is an exploration of Earth Science for students enrolled in the SUNY Oneonta Childhood Education transfer program. Instruction emphasizes learning through inquiry. Content is consistent with the core ideas and learning outcomes prescribed by the Earth and Space Sciences (ESS) core standards, grades 1 - 6, of the Next Generation Science Standards (NGSS), and the National Science Teachers' Association (NSTA). Lecture along with individual and collaborative laboratory activities illustrative various Earth and planetary science phenomena and topics. (Fall only offering)

**II.** **Student Learning Outcomes**

A. The student will develop an understanding of the Earth’s place in the Universe

A1. Students will use observations of the sun, moon, and stars to describe patterns that can be predicted (1-ESS1-1)

A2. Students will make observations at different times of year to relate the amount of daylight to the time of the year (1-ESS1-2)

A3. Students will use information from several sources to provide evidence that Earth events can occur quickly or slowly (2-ESS1-1)

A4. Students will identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in the landscape over time (4-ESS1-1)

A5. Students will be able to support an argument, that differences in the apparent brightness of the sun compared to other stars, is due to their relative distance from the Earth (5-ESS1-1)

A6. Students will represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day, and night, and seasonal appearances of some stars in the night sky (5-ESS1-2)

B. The student will develop an understanding of the Earth’s various systems

B1. Students will use and share observations of local weather conditions to describe patterns over time (K-ESS2-1)

B2. Students will construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their standards (K-ESS2-2)

B3. Students will compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land (2-ESS2-1)

B4. Students will develop a model to represent the shape and kinds of land and bodies of water in an area (2-ESS2-2)

B5. Students will obtain information to identify where water is found on Earth, and that it can be solid or liquid (2-ESS2-3)

B6. Students will represent data in tables and graphical displays to describe typical weather conditions expected during a particular season (3-ESS2-1)

B7. Students will obtain and combine information to describe climates in different regions of the world (3-ESS2-2)

B8. Students will make observations and/or measurements to provide evidence of the effect of weathering or the rate of erosion by water, ice, wind, or vegetation (4-ESS2-1)

B9. Students will analyze and interpret data from maps to describe patterns in Earth’s features4-ESS2-2

B10. Students will develop a model using an example to describe the ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact (5-ESS2-1)

B11. Students will describe and graph the amounts and percentages of water, and fresh water in various reservoirs to provide evidence about the distribution of water on the Earth (5-ESS2-1)

C. The student will develop an understanding of the interactions of the Earth and Humans

C1. Students will use a model to represent the relationship between the needs of different plants and animals (including human) and the places they live (K-ESS3-1)

C2. Students will ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather (K-ESS3-2)

C3. Students will communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment (K-ESS3-3)

C4. Students will make a claim about the merit of a design solution that reduces the impacts of a weather related hazard (3-ESS3-1)

C5. Students will obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment (4-ESS3-1)

C6. Students will generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans (4-ESS3-2)

 C7. Students will obtain and combine information about the ways individual communities use scientific ideas to protect the Earth’s resources and environment (5-ESS33-1)

D. SUNY Natural Sciences General Education Outcomes

 D1. Students will demonstrate an understanding of the methods scientists use to explore natural phenomena, including observation, hypothesis development, measurement and data collection, experimentation, evaluation of evidence, and employment of mathematical analysis

 D2. Students will learn to apply scientific data, concepts, and models in the Earth sciences

**III. Major Topics**

 A. Lecture Topics

 1. The Atmosphere

 A. Composition and dynamics

 B. Clouds and precipitation

 C. Pressure, air masses, and wind

 D. Extreme weather

 2. The Hydrologic Cycle

 A. Running water

 B. Ground water

 3. Weathering and Erosion

 A. Sediment and sedimentary rocks

 B. Soil

 4. Plate Tectonics

 A. Where and why

 B. Volcanoes

 C. Earthquakes

 5. Minerals

 A. Atoms and elements

 B. Mineral resources

 6. The Rock Cycle

 A. Igneous rocks

 B. Metamorphic rocks

 C. Sedimentary rocks

 7. The Oceans

 A. Different environments

 B. Waves and tides

 C. Shoreline interactions

 8. Earth in Space

 A. The Solar System

 1. Inner planets

 2. Outer planets

 3. Comets, asteroids, cosmic debris

 B. Stars and galaxies

 1. Origin and life cycle

 2. Classification

 3. Distances

 C. The Universe

 1. Origin

 2. Evolution

 B. Laboratory Topics

 1. The Atmosphere

 A. Composition

 B. Air pollution

 C. Weather

 1. Cloud recognition

 2. Weather trends

 3. Extreme weather

 2. Water

 A. Fresh water pollution

 B. River flooding

 C. The Oceans

 1. Costal environments

 2. Pollution

 3. Sea level rise

 3. Minerals and Rocks

 A. Identification of common minerals

 B. Identification of common rocks

 4. The Solar System

 A. Composition

 B. Organization

 5. Environments

 A. Types of environments

 B. Biotic and abiotic interactions

 C. Human impact on environments