



ISS Course Syllabus

Teacher: Peter
Course Title: Earth Science

Grade:

Course Description:

Principles of Earth and Space Science: Students investigate, through laboratory and fieldwork, the universe, Earth, and the process that shape Earth. They understand that Earth operates as a collection of interconnected systems that may be changing or may be in equilibrium. Students connect the concepts of energy, matter, conservation, and gravitation to Earth, the solar system, and the universe. Students utilize knowledge of the materials and processes of Earth, planets, and stars in the context of the scales of time and size.

Historical Perspectives of Earth and Space Science: Students gain understanding of how the scientific enterprise operates through examples of historical events. Through the study of these events, they understand that new ideas are limited by the context in which they are conceived, are often rejected by the scientific establishment, sometimes spring from unexpected findings and grow or transform slowly through the contributions of many different investigators.

Course Contents:

Unit 1: Ecology: The Earth’s Natural Resources (36 hours)

Week	Main topics
1	Fossil fuels – what are they, how oil, coal and gas are formed, energy from the sun – passive and active solar energy
2	Renewable and non-renewable sources of energy, wind and water energy, nuclear energy
3	Alternative energy sources- tidal, hydroelectric, biogas, hydrogen, advantages and disadvantages of energy sources
4	Land and soil resources, uses of land, water resources, sources of fresh water
5	Conservation of water, mineral resources, ores and their formation
6	What is pollution? Land pollution – causes and effects, air pollution – causes and effects, greenhouse effect
7	Water pollution – causes and effects, what can be done about pollution
8	Fossil fuels and minerals, protecting the environment – conservation and education

Unit 2: Dynamic Earth (16 hours)

Week	Main topics
1	The earth's changing surface, the floating crust, earthquakes – what causes them, effects
2	Formation of a volcano, volcano and earthquake zones, the earth's continents
3	The earth's spreading ocean floor, the earth's moving plates, What is a mineral? Uses of minerals
4	What is rock? Fluid and fire: igneous rocks; slowly build layers: sedimentary rock.
5	Weathering of rocks and mineral, soil formation
6	Soil composition, changing the surface of the earth, gravity and effects on earth
7	Wind and the effects of wind on the Earth's surface, running water and effects, glaciers
8	Waves and their effects

Unit 3: Exploring the Earth's Weather (26 hours)

Week	Main topics
1	Heating of the earth: radiation, conduction and convection, pressure of the air
2	Winds, how is wind formed, wind speed, hurricanes and tornadoes
3	Moisture in the air, rain, how rain is formed, snow, hail, sleet, humidity
4	Weather patterns, what causes storms – lightening and thunder, predicting the weather
5	What causes climate, climatic zones
6	Changes in the climate – causes, land biomes and climate regions

Unit 4: Exploring Planet Earth (36 hours)

Week	Main topics
1	A view of the planet earth: spheres within a sphere, development of the atmosphere
2	Layers of the atmosphere, the magnetosphere
3	The world's oceans, properties of ocean water, the ocean floor
4	Mapping the ocean floor, ocean life zones, motion of the oceans
5	Fresh water on the surface of the earth, fresh water beneath the surface of the earth, water as a solvent
6	The Earth's continents, topography
7	Mapping the surface of the earth, topographic maps
8	The Earth's core, mantle, crust

Unit 5: Exploring the Universe (16 hours)

Week	Main topics
1	A trip through the universe; history and formation of the universe, the big bang theory
2	Characteristics of stars; a special star, the Earth's sun
3	Evolution of stars and the death of stars, the solar system, orbits
4	Motion of the planets, a trip through the solar system
5	Exploring the solar system, acceleration due to gravity, distance and motion
6	The Earth in space, the Earth's moon, characteristics
7	The Earth, the moon and the sun, eclipses, the space age

Resources:

Prentice Hall Textbooks

Unit 1: Ecology: The Earth's Natural Resources

Unit 2: Dynamic Earth

Unit 3: Exploring the Earth's Weather

Unit 4: Exploring Planet Earth

Unit 5: Exploring the Universe

Evaluation System:

Component	%	Comments
Tests		Unit tests
Labs and assignments		<ul style="list-style-type: none">• Formal Lab reports as well as informal write-ups• Oral Presentations• Projects• Posters
Daily work		Homework, in-class assignments
Exams		10 % mid-term; 10 % final exam
Total		A maximum of 100 % is available

Progress marks will be calculated and reported quarterly. Marks do not close until the final exam has been written.

Additional Comments:

Teaching Strategies and Instructional Methods

Direct Teaching Strategies

- Lectures
- Demonstrations
- Directed problem-solving
- Note taking
- Portfolios
- Posters
- Teacher led review
- Work and Task Sheets

Indirect Teaching Strategies

- Science Experiments
- Oral Presentations
- Drawings

Interactive Teaching Strategies

- Small group cooperative group work
- Small group discussions