PIONEERS INTERNATIONAL SCHOOLS

AMERICAN DIVISION

BIOLOGY DEPARTMENT

**Course Name:**Ecology
**Grade:**12
**Credit Value:**1

**Course teacher : Soha Mohamed**

**Department Biology Head:**Doaa Hussein

**Course Description**

An introduction to the science of ecology, including aspects of living organisms, evolution and ecology of both plants and animals, and fundamental concepts of genetics and molecular biology. Offerings focus on an area of the biological sciences which has an impact on society. Discussions include the impact this area has on society and include an exploration of the use of scientific method. Each offering focuses on one primary topic area. Examples of a primary topic area include environmental science, conservation science, or human health.

Our course supplies students with different information about his society his economy and different environmental issues facing living organisms among their lifetime .

This course provide detailed information about earth’s composition rocks , geological time scale , fossils , earth’s atmosphere and it’s composition , hydrosphere and earth’s water content some examples on different living organisms living in each zone on the earth , different pollution types :

water pollution

Soil pollution

Air pollution

and their impacts on the ecological community and economy .

Additionally due to implementing the AP biology course , at least 1 class per week is held in our biology lab for practical activities , teaming up the class into groups should be held each lecture , having library lessons to catch information with handled books also using computer labs.

**Course Objectives:**

The course will promote understanding of different ecological expressions and relationships , It will provide the opportunity for students to study populations their growth and growth limitations , dispersion and the ecological succession studying the different relationships between organisms studying different terrestrial biomes ecological **community** biosphere .

***At the end of This coursestudents will be able to :***

* Introduce an introductory survey of physical geology, historical geology, oceanography, meteorology, and astronomy.
* Make an introductory survey of physical geology, historical geology, oceanography, meteorology, and astronomy
* Explain the differential exposure to the Sun.
* Different types of terrestrial biomes .
* Biomes contribute to the cycling of matter on Earth.( Carbon , Nitrogen, phosphorus, and water )
* Knowledge of the consequences of increasing atmospheric carbon
* Studying the climatic change
* describe Earth's history in terms of major geological or paleontological events.
* relating geological strata (stratigraphy) to time.
* Dating and Fossils
* view descriptions for our geology courses.
* The nature and origin of rocks
* Discuss the geological processes such as erosion, earthquakes, mountain building and plate tectonics.
* Evaluate natural environmental processes
* Pollution control, environmental management or resource conservation.
* Study the aquatic biomes and different organisms with their adaptations in their biome .

**Textbooks**: AP biology

 Biology Today ( Sandra S. Gottfried )

Barron's biology E/M ( 6th edition )

Interactive science Ecology and the Environment , prentice Hall.

**Units of Study:**

Chapter 1: Population ecology

Chapter 2: Social behavior in animals

Chapter 3: Interactions within communities of organisms

Chapter 4: Ecosystems

Chapter 5: Biomes and life zones of the world

Chapter 6: Geology

Chapter 7: The Biosphere

Chapter 8: Geologic Era

Chapter 9: Pollution

Chapter 10: **Environmental diseases.**

* **Sustainability**
* **Urbanization**
* **Soil pollution**
* **Water pollution**
* **Ecology and economics**

**Chapter Titles and Descriptions**

**Chapter 1: Population ecology**

* An introduction to ecology
* Population growth
* Exponential growth
* Carrying capacity
* Population size
* Population density and dispersion
* Regulation of population size
* Density-independent limiting factors
* Density-dependent limiting factors
* Mortality and survivorship

**Chapter 2: Social behavior in animals**

* **Types of social behavior**
* **Competitive behaviors**
* **Reproductive behaviors**
* **Group behaviors**
* **Parenting behaviors**
* **Human behavior**

**Chapter 3: Interactions within communities of organisms**

* **Ecosystems**
* **Communities**
* **Types of interactions within communities**
1. **Competition**
2. **Predation**
* **Competition and killer bees**
* **Symbiosis**
* **Changes in communities overtime : Succession**

**Chapter4 : Terrestrial Biomes and life zones of the world**

* **Biomes and climate**
* **The sun and its effects on climate**
* **Atmospheric circulation and its effects on climate**
* **Life on land : The biomes of the world**
* **Tropical rain forests**
* **Deserts**
* **Temperate grasslands**
* **Temperate deciduous forests**
* **Taiga**
* **Tundra**

**Duration: 7 weeks**

**Quarterly Exam**

**Chapter 5: Geology**

* **Earth**
* **Earth's layers**
* **Depth and Temperature of earth's layers**
* **Rocks**
1. **Igneous**
2. **Sedimentary**
3. **Metamorphic**
* **Fossils**
1. **Ways of fossilization**
2. **Fossil and rock dating**

**Chapter 6 : Geologic Era**

* **Geologic timescale**
* **Different eras of life**
1. ***Azoic***
2. ***Archaeozoic***
3. ***Proterozoic***
4. ***Palaeozoic***
5. ***Mesozoic***
6. ***Cenozoic***

**Chapter 7: Ecosystems**

* **The cycling of chemicals within ecosystems**
1. **The water cycle**
2. **The nitrogen cycle**
3. **The phosphorus cycle**
4. **The carbon cycle**

**Duration: 7 weeks**

**1st Semester Exam**

**Chapter 7: Ecosystems**

* **Populations , communities and ecosystems**
* **The flow of energy through ecosystems**
* **Food chains and webs**
* **Food pyramids**

**Chapter 8: Pollution**

* **Atmosphere and atmospheric layers**
1. **Ozone shield**
2. **Chloroflorocarbon (CFCs )**
* **Damaging effects of UV on :**
1. **Humans**
2. **Amphibians**
3. **Marine life**
4. **Land plants**
* **Global warming**
* **The consequences of global warming**
* **Major source of greenhouse gas**
* **Pesticides**
* **Acid rain ( Acid precipitation )**
* **Sick-building syndrome**
* **Radon gas pollution**
* **Air pollution primary air pollutants**
* **Surface water pollution**
* **Ground water pollution**

**Duration: 9 weeks**

**Quarterly Exam**

**Chapter 9: The Biosphere** .

* **The biosphere**
* **The land**
* **Diminishing natural resources**
* **Species extinction**
* **Solid waste**

**Chapter 10: Biomes and life zones of the world**

* **Life in fresh water**
* **Estuaries : life between rivers and oceans**
* **Life in oceans**
* **The intertidal zone**
* **The neritic zone**
* **The open-sea zone**

**Duration :7 weeks**

**2nd Semester Exam**

**The Final Grade:**

**COURSE EVALUATION**

**Quarter Grades:**

40% : Final Exam

20% : weekly quizzes

10% : Assignments

10% : Homework

10% : Project

10% : oral participation and class works.

**Semester Grade:**

 50% : 1st Quarter

 50% : 2nd Quarter

**Yearly Grade:**

 50% : 1st Semester

 50% : 2nd Semester