# AP Environmental Science Course No. 03207 Credit: 1.0

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| **Student name:** |  | **Graduation Date:** |  |

Pathways and CIP Codes:Energy (17.2071); Biochemistry (14.1401)

Course Description: **Technical Level:** AP Environmental Science courses are designed by the College Board to provide students with the scientific principles, concepts, and methodologies required to understand the interrelationships of the natural world, identify and analyze environmental problems (both natural and human made), evaluate the relative risks associated with the problems, and examine alternative solutions for resolving and/or preventing them. Topics covered include science as a process, ecological processes and energy conversions, earth as an interconnected system, the impact of humans on natural systems, cultural and societal contexts of environmental problems, and the development of practices that will ensure sustainable systems.

Directions:The following competencies are required for full approval of this course. Check the appropriate number to indicate the level of competency reached for learner evaluation.

**RATING SCALE:**

4. Exemplary Achievement: Student possesses outstanding knowledge, skills or professional attitude.

3. Proficient Achievement:Student demonstrates good knowledge, skills or professional attitude. Requires limited supervision.

2. Limited Achievement:Student demonstrates fragmented knowledge, skills or professional attitude. Requires close supervision.

1. Inadequate Achievement:Student lacks knowledge, skills or professional attitude.

0. No Instruction/Training:Student has not received instruction or training in this area.

## Benchmark 1: Earth Systems and Resources

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 1.1 | Explain the concept of geologic time scale. |  |
| 1.2 | Outline the connections between plate tectonics, earthquakes and volcanism. |  |
| 1.3 | Illustrate the layers of the earth’s atmosphere. |  |
| 1.4 | Explain the concept of the atmospheric circulation and the Coriolis Effect. |  |
| 1.5 | Explain the concept of ocean circulation. |  |
| 1.6 | Outline surface and groundwater issues. |  |
| 1.7 | Explain the rock cycle. |  |
| 1.8 | Describe the main soil types. |  |
| 1.9 | Recall the rock formation process. |  |

## Benchmark 2: The Living World

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 2.1 | Explain the concept of ecological niches. |  |
| 2.2 | Label on a map the locations of the major terrestrial and aquatic biomes. |  |
| 2.3 | Define the concept of keystone species. |  |
| 2.4 | Diagram the processes of photosynthesis and cellular respiration. |  |
| 2.5 | Analyze the relationship between food webs and trophic levels. |  |
| 2.6 | Interprets the concepts of Biodiversity, natural selection and evolution. |  |
| 2.7 | Describes climate shifts, species movement and ecological succession. |  |
| 2.8 | Illustrates a natural biogeochemical cycle (e.g. Carbon, nitrogen, phosphorous, sulfur, water). |  |

## Benchmark 3: Population

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 3.1 | Explain the concept of carrying capacity. |  |
| 3.2 | Interpret human fertility rates, growth rates and doubling times. |  |
| 3.3 | Infers strategies for sustainability. |  |
| 3.4 | Predicts the impact of population growth on a region or bio-system. |  |

## Benchmark 4: Land and water use

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 4.1 | Describes human nutritional requirements. |  |
| 4.2 | Predict the impact of genetic engineering on crop production. |  |
| 4.3 | Generate ideas about the future of sustainable agriculture. |  |
| 4.4 | Compare old growth forests with new growth. |  |
| 4.5 | Explain forest management. |  |
| 4.6 | Explain the dangers of overgrazing of rangeland. |  |
| 4.7 | Outline the concerns with urban land development (e.g., planned development, suburban sprawl, urbanization). |  |
| 4.8 | Describe the problems associated with overfishing. |  |

## Benchmark 5: Energy Resources and Consumption

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 5.1 | Explain major concepts associated with Energy (i.e., energy forms, units, conversions, Laws of Thermodynamics). |  |
| 5.2 | Summarizes present global energy use. |  |
| 5.3 | Illustrates the processes involved in the formation of coal, oil and natural gas. |  |
| 5.4 | Explain the process of nuclear fission. |  |
| 5.5 | Investigate the environmental advantages/disadvantages of nuclear energy. |  |
| 5.6 | Summarizes the process of obtaining hydroelectric power. |  |
| 5.7 | Compares various types of energy conservation strategies. |  |
| 5.8 | Critiques various types of renewable energy (i.e., solar energy, hydrogen fuel cells, wind energy, ocean waves and tidal energy, geothermal). |  |

## Benchmark 6: Pollution

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 6.1 | Identifies the primary and secondary sources of air pollution. |  |
| 6.2 | Lists the primary sources of noise pollution. |  |
| 6.3 | Recalls the major sources of water pollution. |  |
| 6.4 | Summarizes major laws addressing water and air pollution (i.e., Clean Water Act, Clean Air Act. |  |
| 6.5 | Explains the process of environmental risk analysis. |  |
| 6.6 | Discovers what hazardous chemicals are most common in the environment. |  |
| 6.7 | Evaluates the economic impact of pollution on society through a cost-benefit analysis activity. |  |

## Benchmark 7: Global Change

### Competencies

| **#** | **Description** | **RATING** |
| --- | --- | --- |
| 7.1 | Explain the process of stratospheric ozone formation. |  |
| 7.2 | Describe the impacts and consequences of global warming. |  |
| 7.3 | Explain the impact of habitat loss on biodiversity. |  |
| 7.4 | Summarize the reasons for endangered and threatened species legislation. |  |

I certify that the student has received training in the areas indicated.

Instructor Signature:

For more information, contact:

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