Course Name: AP Environmental Science **Level:** AP **Points:** 5

Texts/Instructional Materials:

Miller: Living in the Environment.
Enger: Field and Laboratory Activities

Advanced placement courses follow the curricula determined by The College Board. They are designed to be equivalent to an introductory college course. Students who take these courses must demonstrate that they have met grade 11 and grade 12 Learning Standards in the domain of science covered by the course.

Major Topics:

Interdependence of Earth's Systems: fundamental Principles and Concepts
Human Population Dynamics
Renewable and Nonrenewable Resources: Distribution, Ownership, Use, and Degradation
Environmental Quality
Global Changes and Their Consequences
Environment and Society: Trade-Offs and Decision Making

APES COURSE OUTLINE. Revised Sept 2001

[] Indicates chapters in Miller-11th edition

1. Interdependence: Fundamental Principles and Concepts (25%).
AP Outline:

- **A. The Flow of Energy [Chapter 3]**
  - **1. Forms and quality of energy.**
  - **2. Energy units and measurement**
  - **3. Sources and sinks, conversions**
- **B. The Cycling of Matter [Chapter 5]**
  - **1. Water**
  - **2. Carbon**
  - **3. Major nutrients**
    - **a. Nitrogen**
    - **b. Phosphorus**
  - **4. Difference between cycling of major and trace elements**
- **C. The Solid Earth [Chapter 6: 6.1, 6.2; Ch. 14: 14.1]**
  - **1. Earth history and the geologic time scale**
  - **2. Earth dynamics: plate tectonics, volcanism, and the rock cycle and soil formation.**
- **D. The Atmosphere [Chapter 7: 7.1;Ch. 18: 18.1]**
  - **1. Atmospheric history: origin, evolution, composition, and structure.**
  - **2. Atmospheric dynamics: weather and climate.**
- **E. The Biosphere [Ch. 4,6,7,8,9,10]**

1.organisms: adaptations to their environments
2.populations and communities: exponential growth, carrying capacity
3. Ecosystems and change: biomass, energy transfer, and succession
4. Evolution of life: natural selection, extinction.

2. Human Population Dynamics (10%)

AP OUTLINE:

A. History and Global Distribution. [Chapter11, 10] {11, 12}

1. Numbers
2.demographics such as birthrates and death rates
3. Patterns of resource utilization

B. Carrying Capacity- Local, Regional, Global

C. Cultural and Economical Influences

3. Renewable, Nonrenewable Resources (15%)

AP OUTLINE:

A. Water [Chapter 13]

1. Fresh: agricultural, industrial, domestic
2. Oceans: fisheries, industrial

B. Minerals [Chapter 14] {20}

C. Soils [Ch.14]{20}

1. Soil types
2. Erosion and conservation

D. Biological [Ch. 12]

1. Natural areas
2. Genetic diversity Ch. 4 review
3. Food and other agricultural products

E. Energy [Ch. 15, 16]

1. Conventional sources
2. Alternative sources

F. Land *see other sections

1. Residential and commercial
2. Agricultural and forestry
3. Recreational and wilderness

4. Environmental Quality (20-25%)

AP OUTLINE:

A. Air/Water/Soil [Ch. 18,19,20,21,17,22]

1. Major pollutants

a. Types, such as SO2,NOx, and pesticides
B, thermal pollution
c. Measurements and units of measure such as ppm, pH, ug/L
d. Point and nonpoint sources (domestic, industrial, agricultural)

2. Effects of pollutants on:

a. Aquatic systems
b. Vegetation
c. Natural features, buildings, and structures
d. Wildlife

3. Pollution reduction, remediation, and control

B. Solid Waste

1. Types, sources, amounts

2. Current disposal methods and their limitations

3. Alternative practices in solid waste management

C. Impact on Human Health

1. Agents: chemical and biological

2. Effects: acute and chronic, dose response relationships

3. Relative risks: evaluation and response

5. Global Changes (15-20%)

AP OUTLINE:

A. First Order Effects (changes) [To be covered by student essays]

1. Atmosphere: CO2, CH4, stratospheric O3 [See Ch 23,24,25]

2. Oceans: surface temps, currents.

3. Biota: habitat destruction, introduced exotics, over harvesting

B. Higher Order Interactions (consequences)

1.Atmosphere: global warming, increasing ultraviolet radiation

2. Oceans: increasing sea level, long term climate change, impact on El Nino

Syllabus(subject to change):

1st Quarter: Major Assessments:

Miller: Chapters One, Three, Five, Six, and Seve

1. Lab 1A: Introduction to Experimental Design
2. Seminar Presentations
3. Introduction to Science Fair Projects
4. Exams on readings.

2nd Quarter: Major Assessments:

Miller: Chapters Four, Eight, Nine, Ten, Eleven.

1. Ecosystem, Aquatic ecology Seminars
2. Field Work and Laboratory Assignments
3. Science fair topic discussion and research
4. Ecosystems paper
5. Semester exam

3rd Quarter: Major assessments:

Miller: Chapters Fifteen, Sixteen, Seventeen, Nineteen, Twenty, Twenty-One, Twenty-Three, Twenty-Four, Twenty-Five.

1. Laboratory Investigations on Pollution, Energy, and Population
2. In school and take-home exams

3. Science Fair Participation

4th Quarter: Major assessments:
Miller: chapters Twenty-Six, Twelve, Thirteen, Twenty-Two, Twenty -Eight, Twenty-Nine, Twenty-seven. Note: All relevant chapters in the text will be completed.

1. Portfolio is due
2. Laboratory activities in Stream Ecology, Soil, Geology, Acid deposition, and Global Warming.
3. AP Exam preparation
4. Seminars on Global warming, Ozone thinning, Acid deposition.

***Assessment Tools:**

Portfolios
Teacher observations
Oral presentation Rubrics
Projects
Notebooks
Lab practical
Interdisciplinary activities
Simulations
Role playing
Open ended questions
Co-operative learning projects
Take home tests/writing assignments
Science fair investigative projects
Objective Tests/Quizzes
Exams
Essays
Research papers
Presentations
Attendance
Document Analysis
Field Experience
Mid Year Exam
Final Exam
Homework
Technical Project

*See IEP or 504 plan for modification where applicable.

Grading Policy:

Exams and Laboratory grades make up most of the student evaluation. Homework is only occasionally assigned, but readings are assigned for exams and seminars. The student is expected to do the readings before the exams and seminars are scheduled. Approximately seven to ten hours per week is planned for this. (Note: the AP Board recommends two hours of home preparation for each hour of class.)

The student is expected to take the AP Exam. Failure to prepare and complete the exam will result in grade deductions as well as other penalties.