

## Course Outline

Course Title: Introduction To Environmental Science

Common Course Title: EVR1001

Effective Term: Fall 2017 ( Aug 21, 2017 )

Credit Hours: 3 Units

Next Review : Aug 1, 2020

Contact Hour Breakdown: *(Per 16 week Term)*

Total: 48

Lecture:

Lab:

Clinic:

Other:

## Requirements

Pre-requisite(s) with minimum grade required

MAC1105 **OR** MAC1114 **OR** MAC1140 **OR** MAC1147 (C) **OR**

MAC2233 **OR** MAC2311 **OR** MAS2103 **OR** MAT0028C **OR**

MAT1033 **OR** MGF1106 **OR** MTB1310 **OR** STA2023

## Course Description:

Study of the physical environment, its relationship with the biosphere, and man's impact upon natural systems. This course includes ecological systems, Florida environments and geology, pollution and environmental regulations, renewable and nonrenewable resources, and sustainability. This course meets General Education requirements in the Biological and Physical Sciences. Placement by Testing Department.

## Course Outline

### **UNITS**

#### **Unit 1 : Reading and Writing in the Biological Sciences**

##### General Outcome

1.0 Clearly communicate in writing information derived from course related readings the major concepts and themes in the environmental sciences.

##### Specific Learning Outcomes

1.1 Demonstrate in writing the ability to analyze, evaluate, compare, and extract data relevant to environmental science from course related readings.

1.2 Evaluate the validity of information from a variety of sources, including but not limited to such sources as electronic, print sources, and data bases.

1.3 Demonstrate using diagrams, drawings, outlines, concept maps, and/or other methods connections among concepts in environmental science.

1.4 Demonstrate the ability to use the appropriate technology to carry out course requirements.

#### **Unit 2 : Physical Factors and the Environment**

##### General Outcome

2.0 Demonstrate an understanding of global geologic, atmospheric, and oceanic trends and evaluate their relationship to the environment.

##### Specific Learning Outcomes

2.1 Describe the earth's structure.

2.2 Examine the characteristics of plate tectonic settings and plate movement.

- 2.3 Describe characteristics of the troposphere and stratosphere.
- 2.4 Illustrate the Coriolis Effect on global atmospheric belts.
- 2.5 Explain the generation and movement of air masses.
- 2.6 Compare the patterns of major ocean surface and subsurface currents.

### **Unit 3 : Water in Natural Systems**

#### General Outcome

3.0 Describe and diagram the hydrologic cycle, analyze the characteristics of water and assess the finite, recycled nature of the world's water in relationship to Florida's water budget.

#### Specific Learning Outcomes

- 3.1 Assess the importance of water to life.
- 3.2 Diagram the hydrologic cycle (closed system) showing the various compartments and processes of the cycle.
- 3.3 Demonstrate the flow of water through natural systems in Florida. (Open system)
- 3.4 Evaluate the importance of ground water to Florida.
- 3.5 Recognize and evaluate the impact of humans upon managing the flow of water through Florida.

### **Unit 4 : Ecosystems**

#### General Outcome

4.0 Categorize the ecosystems and the food and energy flow within them.

#### Specific Learning Outcomes

- 4.1 Compare and contrast food chains, food webs, and energy flow through ecosystems.
- 4.2 Describe and quantify trophic levels in ecosystems.
- 4.3 Understand and quantify the concepts underlying population dynamics.
- 4.4 Explain predator-prey relationships and the impact of disruptions on these relationships.
- 4.5 Compare and contrast the major biomes and aquatic ecosystems of the world.
- 4.6 Describe the special features and importance of wetlands ecosystems.
- 4.7 Analyze the concept of succession.
- 4.8 Calculate residence time of pesticides and other toxins introduced into the environment.
- 4.9 Describe and diagram biogeochemical cycles such as carbon, nitrogen, and phosphorus and how they have been impacted by humans.

### **Unit 5 : Geology of Florida**

#### General Outcome

5.0 Categorize the various physiographic regions of Florida and explain the underlying geologic processes and their economic importance as non renewable resources.

#### Specific Learning Outcomes

- 5.1 Describe the formation and characteristics of igneous, sedimentary and metamorphic rocks.
- 5.2 Explain the effect of different methods of weathering on rocks.
- 5.3 Evaluate the impact of underlying geologic formations on the surface.
- 5.4 Explain the origin of minerals such as carbonate and phosphate.
- 5.5 Assess the uses of minerals and other nonrenewable resources mined in Florida.
- 5.6 Determine the importance of soil to ecosystems and their distribution.

### **Unit 6 : Weather and the Environment**

#### General Outcome

6.0 Explain the fundamentals of meteorology and relate these fundamentals to the weather trends in Florida.

#### Specific Learning Outcomes

- 6.1 Analyze the different factors involved in describing weather.
- 6.2 Differentiate between the characteristics of different types of weather fronts.
- 6.3 Evaluate influences on Florida's weather and major weather trends in Florida.
- 6.4 Describe conditions which promote hurricane formation and explain the heat engine dynamics of a hurricane.
- 6.5 Interpret the Saffir-Simpson storm classification scheme and give examples of historical storms which have struck Florida.
- 6.6 Determine methods of adaptation within native species in response to Florida's weather.
- 6.7 Describe the effect of human activities on global warming and solutions that will stabilize the earth's climate.

### **Unit 7 : Ecosystems of Florida**

#### General Outcome

- 7.0 Examine the interaction between the abiotic and biotic factors within different ecosystems of Florida.

#### Specific Learning Outcomes

- 7.1 Describe the geological and other factors that affect ecosystem distribution in Florida.
- 7.2 Examine the characteristics of low energy coastal ecosystems such as mangrove swamps, salt marshes and estuaries and their importance to marine fisheries.
- 7.3 Describe the high energy beach ecosystem, including forces that shape coastlines such as longshore drift; explain the importance of vegetation in stabilizing this dynamic ecosystem and how human activities have contributed to beach erosion.
- 7.4 Compare and contrast the characteristics of wetland ecosystems such as freshwater marshes, cypress swamps, and southern hardwood swamps.
- 7.5 Describe the characteristics of the Everglades and how humans have impacted water distribution, timing, quality and quantity; list Explain the components of CERP and the Kissimmee River Restoration Project.
- 7.6 Compare and contrast the characteristics of upland ecosystems such as slash pine forests, sandhill community, scrub, prairie, and hardwood hammocks.
- 7.7 Analyze the role of fire in shaping Florida ecosystems.
- 7.8 Assess the impact of human activities on Florida ecosystems.

### **Unit 8 : The Ocean**

#### General Outcome

- 8.0 Describe the various physical components of the ocean and the biological interaction with the physical marine environment.

#### Specific Learning Outcomes

- 8.1 Recognize the various physical zones of the ocean including benthic, littoral and pelagic and the types of organisms found in each.
- 8.2 Compare and contrast the diversity of life on a coral reef.
- 8.3 Explain how the health of coral reefs is influenced by the adjacent coastal and inland ecosystems.
- 8.4 Distinguish among the various types of reefs such as barrier, fringe and patch.
- 8.5 Interpret the impact of pollution, global warming, over-fishing and other human activities on the marine environment and suggest possible solutions.

### **Unit 9 : Energy and the Environment**

#### General Outcome

- 9.0 Describe the law of conservation of matter and the two laws of thermodynamics; compare renewable and nonrenewable energy and compare the advantages and environmental costs of each.

#### Specific Learning Outcomes

- 9.1 Apply the Law of Conservation of Matter and the First and Second Laws of Thermodynamics to analyze current environmental problems such as pollution and energy conservation.
- 9.2 Distinguish between potential and kinetic energy.
- 9.3 Describe the differences between renewable and nonrenewable sources of energy, and recognize examples of each.

- 9.4 Calculate how long non-renewable fuels will last under a variety of different consumption rates.
- 9.5 Describe environmental consequences caused by exploiting different forms of energy.
- 9.6 Discuss how transition to renewable forms of energy will help reduce the threat of global warming.

## **Unit 10 : Sustainable Solutions**

### General Outcome

- 10.0 Argue the actions needed to create a sustainable society and analyze ways to apply principles of sustainable thinking to solve environmental problems.

### Specific Learning Outcomes

- 10.1 Define sustainable development and recognize the current lifestyle of North Americans is not sustainable.
- 10.2 Analyze the interrelationship between the three components of a sustainable society: ecological integrity, social justice, and economic prosperity.
- 10.3 Demonstrate how the components of sustainable thinking, including basing decisions on what is best in the long term, utilizing interdisciplinary analysis, mirroring nature's solutions, implementing prevention rather than remediation, and systems analysis, may be applied to daily decisions.
- 10.4 Apply the components of sustainable thinking to the analysis of real world problems such as loss of biodiversity, global warming, deforestation and pollution; implement solutions to local problems.
- 10.5 Assess the role of individuals in creating a sustainable society.