I. **Course Prefix and Number**: BIO / CON 103
Course name: Environmental Science
Credit and Contact Hours: 4 credits, 5 contact hours

BIO / CON 103 Environmental Science (3-2) *4 hrs.*
Environmental Science is a course that explores the interactions and relationships between humans and the Earth. The course will follow the basic themes of sustainability and critical analysis of environmental issues. Students will gain an understanding and appreciation of the impact of humans on the environment while studying ecosystems, the human population, renewable resources, energy, pollution and its prevention, and ways to work toward a sustainable future. In the laboratory component of the course students will learn scientific methodology, sampling procedures and methods used to test environmental quality. A portion of the lab will include outdoor experiences. **B**

II. **Course Outcomes and Objectives**
Learning Outcomes:
Course Objectives:

1. Students will demonstrate an understanding of the impacts of the human population on the natural world.
2. Students will demonstrate or describe the fundamentals of sustainability and will be able to critically assess current and changing technologies that impact the environment.
3. Students will apply scientific methodology in a laboratory environment.
4. Students will demonstrate ability to collect samples from water, soil, etc., and analyze them both in an outdoor and a laboratory environment. Furthermore, students will explain and interpret their experimental results.

Relationship to Academic Programs and Curriculum:

This course is a requirement for A.A.S. Natural Resources Conservation, A.A.S. Natural Resources Conservation: Law Enforcement and A.A.S. Fisheries Technology and A.A.S. Ornamental Horticulture students. It may also be used for laboratory science credit for non-science majors.

College Competencies Addressed by the Course:

___X___ writing
___X___ oral communication
___X___ reading
_____ mathematics
___X___ problem solving
___X___ computer literacy
___X___ ethics and values
___X___ citizenship
___X___ global concerns
___X___ information resources
___X___ professional competency

III. **Methods of Instruction**

Types of Course Materials:
Students will be required to read Environmental Science, most current edition, by R.T. Wright. In addition, students will purchase a lab manual for the course.

Methods of Instruction:
This is a lecture based course with a lab component which will include outdoor experiences.

Assessment Measures:
Each students understanding of the course material will be assessed by their performance on and completion of class assignments, a research paper, exams, and their laboratory reports.

Methods of Evaluation:
Students will earn 75% of their grade from the lecture portion of the course where they will take 3-4 exams and write a research paper. Performance in lab and lab reports will make up the other 25% of the course grade.

IV. General Outline of Topics Covered:

Lecture Topics:

Section One:
- Introduction: Toward a Sustainable Future

Section Two:
- Ecosystems: What Are They?
- Ecosystems: How They Work
- Ecosystems: How They Change

Section Three:
- Wild Species and Biodiversity
- Ecosystem Capital: Use and Restoration

Section Four:
- The Human Population
- Population and Development
- The Production and Distribution of Food
- Pests and Pest Control

Section Five:
- Water: Hydrologic Cycle and Human Use
- Water Pollution and Its Prevention
- Soil: Foundation for Land Ecosystems

Section Six:
- Energy from Fossil Fuels
- Energy from Nuclear Power

- Renewable Energy

Section Seven:

- The Atmosphere: Climate, Climate Change, and Ozone Depletion
- Atmospheric Pollution

Section Eight:

- Municipal Solid Waste: Disposal and Recovery
- Hazardous Chemicals: Pollution and Prevention

Section Nine:

- Sustainable Communities and Lifestyles

Lab Topics:

- Soil organisms
- Human population
- Dissolved oxygen and Introduction to the scientific method
- Eutrophication
- Field trip to wastewater treatment plant
- Physical and chemical properties of soil
- Field trip to Eagle Mountain – renewable energy
- Acid precipitation
- Chloride
- LD_{50}
- Canandaigua lake boat trip