

***APPLICATIONS FOR APPROVAL OF LOCALLY DEVELOPED SYLLABUS IN GENERAL EDUCATION***

**FOR SED USE ONLY**

Referred to: \_\_\_\_\_

Approval for: \_\_\_\_\_

Units of Credit: \_\_\_\_\_

Approval Date: \_\_\_\_\_

For each application, do the following:

- (1) Review the information sheet and determine if syllabus approval is required.
- (2) If syllabus approval is required, submit **TWO** copies of the (signed) application, **TWO** copies of the Data Form, and **ONE** copy of the syllabus to: **Course Approvals, New York State Education, Curriculum and Instruction, Room 681 EBA, Albany, NY 12234.**

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1. School District: South Jefferson Central School
  2. Name of School: South Jefferson High School County: Jefferson
  3. Mailing Address: PO Box 10, Route 11  
Adams, NY Zip Code: 13605
  4. Telephone: (315) 232-4531 5. School (BEDS) Code Number: 220101
  6. Contact Person: William Stowell 7. Title: Agriculture Teacher
  8. Which subject area does this application address?: Environmental Science
  9. Title of Syllabus: Jefferson-Lewis Environmental Science Curriculum  
(SUNY Morrisville's ENSC-100)
  10. Which section/subparagraph of Commissioner's Regulations, Part 100, does this syllabus address? (See Information Sheet, II A, B): \_\_\_\_\_
  11. Is this a request for an extension of a previous approval \_\_\_ Yes  No  
(a) If yes, provide date of previous approval: \_\_\_\_\_  
(b) If yes, and the previous approved syllabus has been updated or changed, check here \_\_\_ and attach to the syllabus a note or other indication(s) explaining where the changes were made.
  12. Is this syllabus approval part of a request for a variance from the commissioner's Regulations, Part 100? \_\_\_ Yes \_\_\_ No  
(a) If yes, has the variance been approved? \_\_\_ Yes \_\_\_ No  
(b) If yes, for which syllabus will your proposed syllabus substitute? (See C.R., Part 100.5)
  13. The syllabus is prepared for which grade(s)? \_\_\_ 8 (Accelerated); \_\_\_ 9; \_\_\_ 10;  11;  12
  14. Name any prerequisites/co requisites: 1 year of high school science or upon recommendation of the Instructor.



## **ABSTRACT**

The Jefferson-Lewis Environmental Science Curriculum (SUNY Morrisville's ENSC-100) was developed to increase environmental literacy and the knowledge of all students in high school. In designing the course, we addressed the following student needs:

- a. Providing high school students with an opportunity to earn college credit.
- b. Providing more options to earn multiple Regents science credits.
- c. A need for more authentic assessment learning environments for students.
- d. A need to develop an understanding of local, national, and global environmental issues.
- e. A need to expose students to career pathways in the area of Environmental Science.

Students are introduced to the basic ecological systems of the environment and how the environment is affected by man. Soil, air, and water management are introduced and students are given the opportunity to examine the local and global effects. Other topics include Integrated Pest Management, wildlife biology, population dynamics, energy, and waste management. Students enrolled in the course have the option to receive college credit through SUNY Morrisville and the content is flexible enough to meet local school district exit outcomes and State Education Department Standards.

## DATA FORM

### I. SYLLABUS DEVELOPMENT

A. LEARNING STANDARDS: Identify those learning standards, by number, which are addressed by this syllabus. (See Learning Standards). MST 1, 2, 4, 5, 6, 7; CDOS 1, 2; ELA 1, 2, 3, 4; SS 2, 3; A 3; HPE 2; (See Jeff-Lewis Science Curriculum Dual Credit with Morrisville)

B. STUDENTS: Identify the target population for the syllabus.  
Any high school student with an interest in environmental science.

Indicate how this syllabus relates to the basic program for these students:

- a. Allow students more options to earn multiple Regents science credits.
- b. Provide an Authentic Assessment learning environment for students.

C. NEEDS ASSESSMENT: In the left hand column list the specific needs that will be addressed by this syllabus. In the right hand column, identify how each need was determined (test results, opinion surveys, interviews, health and academic records, social and community problems, input from students, parents, school personnel, etc.)

#### NEEDS

#### Determination of Needs

- |  |  |
|--|--|
| 1. High school students need an opportunity to have a seamless transition from high school to college. | These needs were determined by communications with the following : |
| 2. Students need more options to earn multiple regents science credits.                                | 1. Students  |
| 3. Students need a Authentic Assessment learning Environment.  | 2. Agri-Science Advisory Boards                                    |
| 4. We need to provide a better understanding of local, national, and global environmental issues.      | 3. Administrators and Guidance Counselors                          |
| 5. Students to be exposed to career pathways in the area of Environmental Science.                     | 4. National Agriculture Council.                                   |
|  | 5. National FFA Organization.                                      |
|  | 6. College and Universities offering Environmental Science.        |
|  | 7. NYS Agr. Tech. Prep.  |
|  | 8. Cornell Agriculture Outreach Program.                           |

D. DEVELOPERS: Identify those persons, with titles, who were involved in developing the syllabus:

Steve Jones	Agriculture Teacher at Belleville Henderson Central School
Mary Rumble	Agriculture Teacher at Carthage High School
Bill Stowell	Agriculture Teacher at South Jefferson High School
Roy Matteson	Agriculture Teacher at Indian River High School
Melvin Phelps	Agriculture Teacher at Lowville Academy Central School
Bruce Rohr	Agriculture Teacher at South Lewis Central School
Dick Campany	Agriculture Teacher at Alexandria Cental School
Dr. Victor I. Okereke	SUNY Morrsville Faculty
Prof. Jim VanRiper	SUNY Morrsville Faculty
Prof. James Crawn	SUNY Morrsville Faculty

- E. RESOURCES: Identify any federal, state, and local community and school resources available to you to implement this syllabus. (Public and private community-based health organizations, pupil personnel staff, business, industry, college, etc)

SUNY Morrisville Faculty  
New York State Agriculture Technical Preparation Program  
Cornell Cooperative Extension  
Soil and Natural Resources Conservation District  
Oswegatchie Education Center – located in Adirondack Park  
Rodman Landfill (Solid Waste Management Facility)  
Wetlands  
Outdoor Science Education Lab – including woodlots  
Department of Environmental Conservation  
St. Lawrence River

## II. SCOPE AND SEQUENCE

### Jefferson – Lewis Environmental Science Curriculum Dual – Credit with Morrisville

1. Introduction to Environmental Science (5 days)
- Describe the three categories into which most environmental problems fall
  - Explain how the population crisis and the consumption crisis contribute to environmental problems.
  - Distinguish between renewable and nonrenewable resources.

**Learning standards – MST 2, 4, and 6**

2. The application of science to solve environmental problems. (10 days)
- Distinguish between pure and applied science.
  - Describe scientific methods.
  - Explain the uses of tables, line graphs, bar graphs and pie charts.

**Learning standards – CDOS 1, ELA 1 and 4, MST 1, 2, and 4**

**Activity:** An Onion Conundrum

3. The identification of ecosystems and their management, and the identification of biomes. (20 days)
- Distinguish between the biotic and abiotic factors in an ecosystem
  - Explain the terms population and community
  - Explain the five major types of species interactions and give examples of each
  - Explain the concept of biodiversity
  - Discuss why many believe that biodiversity contributes to ecological stability
  - Define a biome
  - Compare and contrast the world's biomes
  - Describe plant and animal adaptations in each biome
  - Explain why biodiversity is so much greater in the tropics than in cooler regions of the planet

**Learning standards – SS 3, and MST 6**

**Activities:** Research and build a model of a biome  
Aquaculture  
Design a composting unit

4. Soils – land use and forestry (35 days)
- Describe the physical properties that determine the value of soil
  - List and describe the eight land use classes
  - Describe major mechanical and ecological means of erosion control
  - Define suburban sprawl and explain why it is considered a problem
  - Explain how logging, ranching and mining activities affect the land
  - Discuss the role of trees in human thinking
  - Outline some of the major contributions of trees to the environment
  - Discuss the negative impacts of the environment from some forestry activities

**Learning standards – MST 1, 2, 4, 5, 6, and 7, and A 3**

**Activities:** Soil judging  
Determine the physical characteristics of the soil  
Learn to use soil survey maps provided by SCS  
Identify the parts of a tree and determine its age  
Identify trees from the FFA's CDE – tree id  
Calculate the ecological dominance, and frequency  
Determine board feet

5. Water resources (15 days)

- Explain why fresh water is a precious resource
- Describe our main sources of fresh water
- Explain why fresh water is often in short supply
- Explain why groundwater pollution is hard to clean
- Define and compare point and nonpoint pollution
- Describe the impact of water pollution on people and the environment
- Discuss the effects of polluted oceans on humans

**Learning standards – HPE 2, and MST 1, 4, 6, and 7**

**Activities:** Water testing  
Stream study  
Groundwater flow models  
Groundwater levels and wetlands

6. Air quality (15 days)

- Name the major causes of air pollution
- Explain how we could reduce air pollution
- Explain how a thermal inversion can make air pollution worse
- Describe some possible health effects of air pollution
- Explain what causes indoor air pollution and how it can be prevented
- Explain what causes acid precipitation
- Explain how acid precipitation affects ecosystems
- Explain why the earth and its atmosphere are like a greenhouse
- Explain why carbon dioxide levels in the atmosphere are rising
- Explain why many scientists think that the earth's climate will get warmer
- Describe what a warmer earth might be like
- Explain how the ozone layer shields the Earth from much of the sun's harmful radiation
- Explain how CFC's are damaging the ozone layer
- Describe the damaging effects of excessive ultraviolet light.

**Learning standards – HPE 2, and MST 1, 4, 6, and 7**

**Activities:** Study acid precipitation affect on plants  
Monitor air quality  
Global warming in a jar

7. Energy (20 days)

- Explain how fossil fuels are used to produce electricity
- Explain how our major sources of energy are dwindling
- Explain the advantages and disadvantages of nuclear energy
- Describe methods of conserving energy
- Describe several alternative energy sources

**Learning standards – MST 3, 4, and 5 and SS 2 and 3**

**Activities** solar oven  
Research project

8. Wildlife biology and management (20 days)

- Explain the five major types of species interactions and give examples of each (ex.-perdition)
- Explain the requirements for habitat
- Explain the importance of game laws
- Explain methods of survival when food supplies are short
- Draw a food web
- Explain the concept of adaptation
- Define the term extinction, and explain the influence of man
- Describe the main provisions of the Endangered Species Act
- Discuss controversies about efforts to protect endangered species

**Learning standards – MST 1, 4, 6, and 7 and ELA 2 and 3**

**Activities**      Research project on endangered species  
Habitat improvement

9. Population ecology – food (5 days)

- Describe the factors that affect a population's size
- Explain why populations grow and what will limit that growth
- Describe how the size of the human population has changed
- Describe the problems stemming from overpopulation
- Explain why providing adequate food for all of the world's people is so difficult
- Describe the advantages and disadvantages of the green revolution

**Learning standards – MST 3, 6, and 7 and SS 2 and 3**

**Activities:**      Answer Data Base Question on World Population  
Graph animal population growth  
Use Point Quarter Method to determine species dominance

10. Integrated Pest Management (IPM), chemicals and the environment (15 days)

- Explain why pest control is often necessary
- Explain how insects can become resistant to pesticides
- Discuss biological pest and disease control procedures that can be used in crop production
- Discuss the implications of organic gardening and organic farming on human society
- Discuss the relationships between agriculture pest control practices and the environment
- Discuss the potential positive and negative effects of chemical fertilizers in the environment

**Learning standards – HPE 2, and MST 3, 4, 6, and 7**

**Activities**      build bat houses  
Pest identification  
Determine threshold limits of pests  
Examine a leaf for pests

11. Waste management (15 days)

- Define solid waste
- Explain how most municipal solid waste is disposed of
- Describe three ways to reduce the amount of waste that goes to landfills and incinerators
- Define hazardous waste
- Explain how most hazardous waste is disposed of in the United States
- Explain the two best ways to deal with the hazardous waste problem

**Learning standards – HPE 2, and MST 1 and 4**

**Activities**      Build a model landfill, weigh and record changes in materials  
Build a model of wastewater treatment facility  
Field trips

12. Students will design and carry out a long-term experiment, which will be based upon a current environmental issue. (5 days)

**Learning standards ELA 1 and 3, CDOS 1 and 2, and MST 1, 2, 3, 4, 5, 6, and 7**

**TOTAL TIME = 180 days**

**Learning Standards for New York State**

**Health, Physical Education, and Home Economics**

- Standard 1 Personal health and fitness
- Standard 2 A safe and healthy environment
- Standard 3 Resource management

**Mathematics, Science and Technology**

- Standard 1 Analysis, inquiry and design
- Standard 2 Information systems
- Standard 3 Mathematics
- Standard 4 Science
- Standard 5 Technology
- Standard 6 Interconnectedness: common themes
- Standard 7 Interdisciplinary problem solving

**The Arts**

- Standard 1 Creating, performing and participating in the arts
- Standard 2 Knowing and using arts materials and resources
- Standard 3 Responding to and analyzing works of art
- Standard 4 Understanding the cultural contributions of art

**Career development and Occupational Studies**

- Standard 1 Career development
- Standard 2 Integrated learning
- Standard 3 Universal foundation skills

**English Language Arts**

- Standard 1 Language for information and understanding
- Standard 2 Language for literary response and expression
- Standard 3 Language for critical analysis and evaluation
- Standard 4 Language for social interaction

**Social Studies**

- Standard 1 History of the United States and New York
- Standard 2 World history
- Standard 3 Geography
- Standard 4 Economics
- Standard 5 Civics, citizenship and government

### III. COURSE SAMPLER

For a major learner outcome in one of the units Section II, list three specific objectives for students. For each objective, identify instructional strategies, materials/equipment/facilities, and evaluation techniques that will be used to achieve it. This section should assist a person not familiar with the course to see how the syllabus will be translated into the classroom.

TITLE OF UNIT: Soils – Land use and Forestry

MAJOR LEARNER OUTCOME: Instill in student’s knowledge of the importance of land and what it provides for human populations. They will then be able to intelligently chose from among different land use options and to reason through land use conflicts.

<b>SUBJECT OBJECTIVES</b>	<b>Instructional Strategies</b>	<b>Materials/Facilities/Equipment</b>	<b>Evaluation (of Student Achievement)</b>
1. Describe the physical properties that determine the value of soils.	1. Students will perform chemical and physical separation of soil particles to determine soil texture, structure, tilth, and mottling.  2. Use the US Geological Survey and Maps to determine soil properties.	1. US Geological Survey and Maps. 2. Soil Test Kits. 3. Soil Probe 4. Land Lab. 5. Soil Particle Separator.	1. Students will apply their knowledge by participating in a Soils Career Development Event and/or the Envirothon.  2. Written/oral exam. 3. Lab practicum.
2. List and Describe 8 Land Use Classes	1. Use visuals to show examples of land classes.  2. Have students construct models of the various land classes.  3. Site Observations.	1. Audiovisuals including, slides, posters, videos, and multimedia presentations.  2. Student researched and constructed models.	1. presentation and explanation of models. 2. Written/oral exams. 3. Lab practicum.
3. Define suburban sprawl and explain why it is considered a problem.	1. Visuals that show statistics on arable land losses.  2. Show local land use plan for the town or village.	1. Use Baltimore’s Land Use Plan available on internet.  2. Secure a copy of the local land use plan.	1. Class discussion using inquisitive evaluation techniques.

## IV. EVALUATION

### A. Evaluation of Student Achievement:

1. List the various techniques that will be used to evaluate student achievement throughout the course.  
(Periodic exams, projects, psychomotor testing, etc.)

Research projects

Written and oral exams

Essays

Student Presentations

Practicum's and or Career Development Events

2. Provide an outline or copy of the proposed final examination/student assessment on the course.

The final project for this course will be a science based investigation and presentation on a topic covered during the course. Students will have the option to work individually or with a partner and will be scored with the appropriate rubric. In addition, the science project will have an accompanying research paper that will be scored with its' own rubric. The rubric scoring sheets follow on the next three pages.

Exam – Exam questions will be developed each year by the "Developers" (See Page 4, section D "Developers") consisting of the Agriculture Teachers in Jefferson and Lewis Counties, in conjunction with SUNY Morrisville Staff.

Lab Requirements: - 1200 minutes. Lab time requirements will consist of a combination of various activities throughout the school year including, but not limited to: Agronomy, Water Quality, Woodlot Management, Wildlife Management, Air Quality, Integrated Pest Management, and Waste Management.

## ENVIRONMENTAL SCIENCE RESEARCH PAPER EVALUATION

Student: \_\_\_\_\_

Date: \_\_\_\_\_

<i>Factor</i>	0	<i>Marginal</i>	3	4	<i>Competent</i>	7	8	<i>Distinguished</i>	10	<i>Points</i>
<b>FORMAT</b> <small>paper is double-spaced, typed, has running headings, page no's, &amp; each section starts on a new page</small>										
<b>GRAMMAR</b>										
<b>ABSTRACT</b> <small>Title, Author, Purpose Statement Hypothesis, Methodology, Results, Conclusion</small>										
<b>INTRODUCTION/ HYPOTHESIS</b>										
<b>REVIEW OF LITERATURE</b>										
<b>METHODOLOGY</b>										
<b>RESULTS</b>										
<b>CONCLUSION</b>										
<b>BIBLIOGRAPHY</b>										

## ENVIRONMENTAL SCIENCE DISPLAY EVALUATION (Individual)

Student \_\_\_\_\_

Date \_\_\_\_\_

	0	10	11	20	21	30	
Factor	<b>Marginal</b>			<b>Competent</b>		<b>Distinguished</b>	Points
<b>CREATIVE ABILITY</b>	Display is somewhat sloppy and not neatly planned out.			Display is somewhat attractive. Moderate effort was made.		Display is unique, interesting, and appealing to the eye. Put in much time & effort.	
<b>Factor</b>	<b>Marginal</b>			<b>Competent</b>		<b>Distinguished</b>	Points
<b>SCIENTIFIC THOUGHT &amp; ENGINEERING GOALS</b>	Put little thought into research topic. Topic is weak.			Put moderate effort into research topic and hypothesis.		Well thought out and unique topic. Hypothesis was creative and logical.	
<b>Factor</b>	<b>Marginal</b>	5	6	<b>Competent</b>	10	11	15
<b>THOROUGHNESS</b> <small>display should include abstract, purpose, hypothesis, procedure, data, graphs or charts, and conclusion</small>	Display includes less than three of the required elements.			Display includes between three and six of the required elements.		Display includes more than six of the required elements.	
<b>Factor</b>	<b>Marginal</b>	5	6	<b>Competent</b>	10	11	15
<b>SKILL</b>	Display does not convey any skills gained through this project.			Display conveys an average skill level gained through this project.		Display conveys an above average level of skill gained through this project.	
<b>Factor</b>	<b>Marginal</b>	4	5	<b>Competent</b>	7	8	10
<b>CLARITY</b>	Project is presented in a confusing or incomplete manner. Topic is unclear.			Project is displayed in a somewhat organized manner. Topic is somewhat clear.		Project is displayed in a neat, and organized manner. Project topic is very clear.	

Comments: \_\_\_\_\_

## ENVIRONMENTAL SCIENCE DISPLAY EVALUATION (team)

Date: \_\_\_\_\_

Team members: \_\_\_\_\_

Factor	0	8	9	17	18	25	Points
	<b>Marginal</b>		<b>Competent</b>		<b>Distinguished</b>		
CREATIVE ABILITY	Display is somewhat sloppy and not neatly planned out.		Display is somewhat attractive. Moderate effort was made.		Display is unique, interesting, and appealing to the eye. Put in much time & effort.		
SCIENTIFIC THOUGHT & ENGINEERING GOALS	Put little thought into research topic. Topic is weak.		Put moderate effort into research topic and hypothesis.		Well thought out and unique topic. Hypothesis was creative and logical.		
THOROUGHNESS	Display includes less than three of the required elements.		Display includes between three and six of the required elements.		Display includes more than six of the required elements.		
	0 4		5 8		9 12		
SKILL	Display does not convey any skills gained through this project.		Display conveys an average skill level gained through this project.		Display conveys an above average level of skill gained through this project.		
	0 4		5 7		8 10		
CLARITY	Project is presented in a confusing or incomplete manner. Topic is unclear.		Project is displayed in a somewhat organized manner. Topic is somewhat clear.		Project is displayed in a neat, and organized manner. Project topic is very clear.		
	0 5		6 11		12 16		
TEAMWORK	Evidence of some team members not contributing or not Knowledgeable about the topic.		Team members all contribute yet not equally. Some members appear to have more knowledge of the topic.		Team members contribute equally and are fully Knowledgeable about the topic.		

**B. Course Revision**

Identify the procedure(s) to be used for improving this course

Each year the course will be reviewed by a group of teachers using the course and instructors at

Jeff-Lewis Environmental Science Curriculum

at SUNY Morrisville. Suggestions to improve the course will be implemented and the curriculum will be modified. In-Service instruction will be provided by Morrisville College, Cornell Agriculture Outreach Program, and the New York Agr. Tech Prep. Program.

V. STAFFING/INSERVICE

Staffing: duplicate this page if needed:

Name of Teacher: William Stowell  
Type of Certificate: Agriculture Permanent  
Date of Certification: September 1983  
Valid for What Subjects: Agriculture  
Undergraduate Major: Agriculture Education Semester Hours: 60  
Undergraduate Minor: Agriculture Engineering Semester Hours: 60  
Graduate Major: Vocation Education Semester Hours: 36

Length of time Teaching: 17 years

Length of time Teaching Specific Subject Disciplines: 17 years teaching...  
Animal Science, Plant Science, Agriculture Business, Environmental Science, Agri-Science,  
Agriculture Mechanics, and 7<sup>th</sup> Grade Technology.

Courses, training, or unique experiences which qualify this teacher to teach this course.

Hunter Education Instructor – New York State DEC Certified.

INSERVICE: Identify school/district strategies/techniques to be used to implement the teaching of this Course:

School district will provide opportunities for the instructor to participate in "In-Service" programs that support this course. District has entered into an articulation agreement with SUNY Morrisville which provides students the opportunity to earn college credit.

For questions and/or additional information on this Environmental Science Curriculum, please contact

William Stowell  
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(315)-232-4531