

VALLEY ROP COURSE OUTLINE

COURSE TITLE:	Agriculture & Natural Resources
VALLEY ROP #:	AG-4060-NR
CDE #:	457
CBEDS TITLE:	Forestry & Natural Resources
CBEDS #:	4060
CTE SECTOR:	Agriculture and Natural Resources
CTE PATHWAY:	Forestry and Natural Resources
JOB TITLES:	Other Agricultural, Forestry, Fishing (OES 799990)

COURSE DESCRIPTION:

This course is designed to provide the student with theories and principles related to Agriculture & Natural Resources. Students will learn about the science in natural resources, conservation, soil, water, wildlife classification & habitat, forest species, air pollution, land quality, weather & climate, environmental impact on mineral use, sustainable agriculture systems and waste management. This course is intended to successfully prepare students who plan on majoring in agriculture natural resources at a four-year college and/or university. Specific student outcomes are:

- Utilize Agriculture & Natural Resource concepts as a relevant vehicle to teach biological, physical, and geosciences principles and improve the science principles and scientific literacy of students.
- Integrate mathematic standards, Language Arts, and science principles into an academically rigorous course that increases the student's capacity to think analytically, problem solve, and utilize effective research practices.

DATE APPROVED:	2003
REVISED DATE(S):	March 2009 / Oct 2009
HOURS:	180 hours/year
CREDITS:	10 credits/year
PREREQUISITES:	Completion of Algebra I or Concurrently Enrolled
GRADE LEVEL:	11-12th Grade
ARTICULATION(S):	Meets the UC "g" Admission Requirement

TEXTSBOOKS:	Lee (2002). <u>Natural Resources and Environmental Technology</u> , Interstate, Illinois. Rolfe, Edgington, Holland & Fortenberry (2003). <u>Forests and Forestry, 6th Edition</u> , Prentice Hall Interstate, New Jersey. Stutzenbaker, Scheil, Swan, Lee & Omernik (2003). <u>Wildlife Management: Science & technology, 2nd Edition</u> , Prentice Hall Interstate, New Jersey. Camp & Daugherty (1997). <u>Managing Our Natural Resources, 3rd Edition</u> , Delmar Publishers, New York. Camp & Daugherty (1997). <u>Managing Our Natural Resources Laboratory Workbook, 3rd Edition</u> , Delmar Publishers, New York.
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COURSE COMPETENCIES:

Upon completion of this course, the student will:

- Understand the importance of Natural Resources and its relationship to man.
- Describe and identify the human population trends and demands on our resources.
- Understand the science of natural resources
- Analyze the natural resource damage that occurring in our ecological system.
- Describe the physical and chemical properties of soils.
- Hypothesize solutions for soil erosion problems.
- Examine the importance of water and the water cycle.
- Describe the climatic influences on plant growth and development.
- Understand and explain the wildlife classification system.
- Identify different varieties of forest trees.
- Incorporate scientific methods and biological principles with modern Natural Resource practices.
- Prepare students for college level entry in the various disciplines of Natural Resources.
- Be familiar with cell theory and its application to the organization of all natural resource organisms.

INSTRUCTIONAL METHODS:

- Lecture
- Audio Visual Materials
- Research Readings and Written Presentations
- Homework Assignments
- Group & Individual Activities
- Laboratory Investigation – 1 per week (20% of grade)
- Discussion & Group Dynamics
- Quizzes, Tests & Final Exam
- Guest Speakers
- Field Trips
- Internet Exploration
- Seminar Presentation

EVALUATION METHODS:

Assessment opportunities, which allow continuous evaluation of students' progress, will be embedded throughout the course and should be a learning experience. All students will be expected to achieve mastery of all topics; often, demonstrations of mastery will occur in a public forum. The following strategies, which include both formal and informal assessment techniques will include, but are not limited to:

- Quizzes, Tests & Final Exam
- Laboratory Investigation & Write-ups
- Writing Assignments
- Leadership & Critical Thinking Activities
- Research Report and Seminar Presentation
- Supervised Agricultural Experience Project & Record Book

COURSE OUTLINE:

Unit of Instruction	Estimated Hours	State Framework
○ Introduction to Natural Resources	6	
○ Kinds of Natural Resources		
○ Renewability & Exhaustibility		
○ Conservation and Preservation		
● Use of Natural Resources	7	
○ Human Population Trends & Demands		
○ Resource Supply & Population		
○ Urban and Rural Impacts to the Environment		
○ Resource Recycling & Reuse		
● Science in Natural Resources	4	
○ The Earth in its Solar System		
○ Spheres		
○ Ecology		
○ Succession		
● Natural Resource Conservation	6	
○ The Importance of Conservation		
○ Natural Resource Damage & Pollution		
○ History of Natural Resource Conservation		
● Soil - Renewable Natural Resource	7	
○ The Importance of Soil		
○ Soil Content & Formation		
○ Chemical & Physical Properties of Soil		
○ Soil Profiles		
● Water and Natural Resources	11	
○ The Importance of Water		
○ Water Composition and States		
○ The Water Cycle		
○ Watersheds & Wetlands		
○ Water Quality Factors		
● Wildlife	15	
○ Wildlife Classification		
○ Wildlife Animals		
○ Habitat Classification		
○ Wildlife Endangerment & Protection Practices		
● Forests	12	
○ Use of Forests		
○ Physical Structure of Forests		
○ Tree Species		
○ Names and Identification of Trees		
○ Forest Management		
● Air	10	
○ Air Quality & Pollution		
○ Air Quality Standards		
○ Testing Air Quality		
○ Preventing Air Pollution and its Impact on the Environment		
○		

- Land Resources 16
 - Land Quality & Capability
 - Capability Classification
 - Land Surveying
 - Land Descriptions
- Weather and Climate 13
 - Weather and Climate as Resources
 - Latitude and Longitude
 - Measuring Weather
 - Relationships to the Environment
- Energy – Nonrenewable Natural Resource 10
 - Energy as a Resource
 - Sources of Energy
 - Energy Conservation
- Minerals 10
 - Important Minerals
 - Environmental Impact of Mineral Use
 - Mineral Use and Supply
- Sustainable Agriculture 18
 - Sustainable Agriculture Systems
 - Crop Cultural Practices
 - Sustainable Agriculture Practices
 - Precision Technologies
- Agriculture & Natural Resources Research Project 15
 - Development of Agriculture & Natural Resources project
 - Statistical management of project via Record Book
 - Instructional coordination and supervision
 - Analysis of project results
- Professional Opportunities in Agriculture & Natural Resources 4
 - Agriculture & natural resources research fields
 - Other related agriculture & natural resource fields
- Agricultural Inter-Personal & Leadership Development 16
 - Completion of a Supervised Agricultural Experience Program and data collection
 - Development of listening, speaking, writing & reading skill activities
 - Critical thinking & group team building activities
 - Agriculture presentations

Total Hours

180 Total Hours

KEY ASSIGNMENTS:

- Research Paper on Agriculture & Natural Resources
- Seminar Presentation on Agriculture & Natural Resources Practices
- Development of Science Fair Project relating to Agriculture & Natural Resources
- Laboratory activities
- Supervised Agricultural Experience Project & Record Book
- FFA Leadership Participation

LABORATORY ACTIVITIES:

- The Scientific Method
- Food Chains
- Botanical Identification of Trees and Collections
- Soil Erosion Activity
- Factors Affecting Photosynthesis
- The Hydrologic Cycle
- Effects of Nutrient Concentrations on Forage Growth
- Effects of Chemicals on the Environment
- Seed Dispersal in Forests
- Insect Identification & Collection
- Environmental Pollution
- Recording Weather
- Water Quality
- Research Population Trends
- Visitation of Natural Science Museum
- Mapping Terraces
- Determine Texture of Soil using Ribbon Test
- Soil Sample Analysis
- Water Sample Analysis – Microscope
- Stream Plankton Investigation – Microscope
- Visitation Zoological Park – Species Identification
- Air Sampling & Testing Equipment Activity
- Surveying Instrument Activity
- Bureau of Land Management Activity
- Weather Station – Data Collection & Analysis Activity
- Investigation of Electricity Use
- Mineral Testing Activity
- Integrated Pest Management Activity

CAREER PREPARATION STANDARDS:

- A. **PERSONAL SKILLS** - Students will understand how personal skill development affects their employability. This skill includes positive attitudes, self-confidence, honesty, responsibility, initiative, self-discipline, personal hygiene, time management, and the capacity for lifelong learning.
1. Demonstrate an understanding of classroom policies and procedures.
 2. Discuss importance of the following personal skills in the business environment:
 - a. positive attitude
 - b. self-confidence
 - c. honesty
 - d. perseverance
 - e. self-management/work ethic
 - f. pride in product/work
 - g. dependability
 3. Identify acceptable work attire.
 4. Establish goals for self-improvement and further education/training.
 5. Prioritize tasks and meet deadlines.
 6. Understand the importance of initiative and leadership.
 7. Understand the importance of lifelong learning in a world of constantly changing technology.
- B. **INTERPERSONAL SKILLS** - Students will understand key concepts on group dynamics, conflict resolution, and negotiation. This skill includes the ability to work cooperatively, accept supervision, assume leadership roles, and show respect for others. This standard includes an understanding of sexual harassment laws and an appreciation of cultural diversity in the workplace.
1. Identify and discuss behaviors of an effective team.
 2. Explain the central importance of mutual respect in the workplace relations.
 3. Discuss and demonstrate strategies for conflict resolution and negotiation, and explain their importance within the business environment.
 4. Understand laws that apply to sexual harassment in the workplace, and identify tactics for handling harassment situations.
 5. Work cooperatively, share responsibilities, accept supervision and assume leadership roles.
 6. Demonstrate cooperative working relationships and proper etiquette across gender and cultural groups.
- C. **THINKING AND PROBLEM-SOLVING SKILLS** - Students will exhibit critical and creative thinking skills, logical reasoning, and problem-solving. These skills include applying basic skills in order to calculate, estimate, measure; identify, locate, and organize information/data; interpret and follow directions from manuals, labels, and other sources; analyze and evaluate information and solutions.
1. Recognize the importance of good academic skills and implement a plan for self-improvement as needed.
 2. Read, write, and give directions.
 3. Exhibit critical and creative thinking skills and logical reasoning skills, and employ these skills for problem solving.
 - a. Work as a team member in solving problems.
 - b. Diagnose the problem, its urgency, and its causes.
 - c. Identify alternatives and their consequences.
 - d. Explore possible solutions.
 - e. Compare/contrast the advantages and disadvantages of alternatives.
 - f. Determine appropriate action(s).
 - g. Implement action(s).
 - h. Evaluate results of action(s) taken.

D. **COMMUNICATION SKILLS** - Students will understand principles of effective communication. This standard includes effective oral and written communication, listening skills, following and giving directions, requesting and giving information, asking questions.

1. Use communication concepts in application of skills, techniques, and operations.
 - a. Prepare written material.
 - b. Analyze written material.
2. Understand and implement written instructions, from technical manuals, written communications, and reference books.
3. Present a positive image through verbal and nonverbal communication, and understand the power of body language in communication.
4. Demonstrate active listening through oral and written feedback.
5. Give and receive feedback.
6. Demonstrate assertive communications (both oral and written).
7. Demonstrate proper etiquette in workplace communications, including an awareness of requisites for international communications (languages, customs, time zones, currency and exchange rates).
8. Demonstrate writing/editing skills as follows:
 - a. Write, proofread, and edit work.
 - b. Use correct grammar, punctuation, capitalization, vocabulary, and spelling.
 - c. Select and use appropriate forms of technology for communication.
9. Exhibit a proficiency in the use of reference books.
10. Research, compose, and orally present information for a variety of business situations utilizing appropriate technology.

E. **OCCUPATIONAL SAFETY** - Students will understand occupational safety issues, including the avoidance of physical hazards in the work environment. This includes the safe operation of equipment, proper handling of hazardous materials, appropriate attire and safety accessories, avoidance of physical injuries, interpretation of warning and hazard signs and terminology, and following and understanding safety-related directions.

1. Discuss and implement good safety practices, including the following (if applicable to course):
 - a. personal
 - b. lab
 - c. fire
 - d. electrical
 - e. equipment
 - f. tools
 - g. interpretation of Material Safety Data Sheets (MSDSs)
 - h. Environmental Protection Agency (EPA)
 - i. Occupational Safety and Health Administration (OSHA)
 - j. American Red Cross Standards (ARC)
 - k. Networking Safety Standards
2. Apply sound ergonomic principles in organizing one's work space.

F. **EMPLOYMENT LITERACY** - Students will understand career paths and strategies for obtaining employment within their chosen field. This includes traditional job preparation skills, such as resumes, application forms, cover letters, sources of employment information, and interviewing skills, but also includes an overview of the industry and an understanding of labor market trends.

1. Explore career opportunities and projected trends; investigate required education, training and experience; and develop an individual education plan.
2. Identify steps for setting goals and writing personal goals and objectives.
3. Examine aptitudes related to career options; relate personal characteristics and interests to educational and occupational opportunities.
4. Develop a career portfolio, including the following documents:

- a. job application
 - b. resume(s)
 - c. appropriate cover and follow-up correspondence
5. Identify and demonstrate effective interviewing techniques.
- G. **TECHNOLOGY LITERACY** - Students will understand and adapt to changing technology by identifying, learning, and applying new skills to improve job performance. Students should understand the role of technology in their chosen field and should be able to use all appropriate technology. Students should also feel confident in their ability to learn new technology by generalizing from what they know, adapting skills to new situations, and identifying and using sources of information and of further learning.
- 1. Demonstrate the ability to use personal computers for loading and retrieving data, information gathering, measurements, and writing.
 - 2. Identify the characteristics and explain the importance of adapting to changes, being flexible, and evaluating goals when working in the industry.
 - 3. Understand the importance of lifelong learning in adapting to changing technology.
- H. **IMPORTANCE OF ETHICS** – Students will understand proper ethics in the workplace.
- a. Discuss social and ethical responsibilities in the industry.
 - b. Demonstrate ethical choices in workplace situations.