

## NATURAL RESOURCES

*Natural Resources* is a two semester course that provides students with a background in environmental science and conservation. Course work includes hands-on learning activities that encourage students to investigate areas of environmental concern. Students are introduced to the following areas of natural resources: soils, the water cycle, air quality, outdoor recreation, forestry, minerals, interrelationships between humans and natural systems, wetlands, wildlife, safety, careers, leadership, and supervised agricultural experience programs.

*Natural Resources* prepares students for many careers in agriculture, and more specifically natural resources. These careers include but not limited to: Aquaculturist, Conservation Law Enforcement, Ecologist, Energy Exploration, Fishery Manager, Forester, Geologist, Logging Operations, Natural Resource Scientist, Mine Operator, Nuisance Wildlife Manager (Trapper), Park/Forest Manager, Ranch Manager/Guide, Rangeland Conservationist, Soil Scientist, Water Resources Manager, and Wildlife Manager

### Course Specifications

- DOE Code: 5180
- Recommended Grade Level: Grade 9-12
- Recommended Prerequisites: Introduction to Agriculture, Food, and Natural Resources
- Credits: 1 credit per semester, maximum of 2 credits
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas

### Dual Credit Alignment

This course provides the opportunity for dual credit for students who meet postsecondary requirements for earning dual credit and successfully complete the dual credit requirements of this course.

### Career and Technical Student Organizations (CTSOs)

Career and Technical Student Organizations are considered a powerful instructional tool when integrated into Career and Technical Education programs. They enhance the knowledge and skills students learn in a course by allowing a student to participate in a unique program of career and leadership development. Students should be encouraged to participate in FFA, the CTSO for this area.

### Content Standards

#### Domain: Natural Resources Management

**Core Standard 1:** Students identify, classify, and examine natural resource availability and ecosystem function.

#### Standards

- NR-1.1 Analyze the interdependence of organisms within an ecosystem (e.g., food webs, niches, impact of keystone species, etc.) and assess the dependence of organisms on non-living components (climate, geography, energy flow, nutrient cycling, etc.)
- NR-1.2 Evaluate biodiversity in ecosystems and devise strategies to enhance the function of an ecosystem and the availability of natural resources by increasing the level of biodiversity
- NR-1.3 Identify different types of biotic (e.g. plants, animals, etc.) and abiotic (e.g. minerals, soil, wind, solar, water, air, etc.) natural resources in order to protect, conserve, manage, and understand their role in a healthy ecosystem
- NR-1.4 Identify invasive species and understand their impact on the environment

**Core Standard 2:** Students apply ecological concepts and principles to natural resource systems.

**Standards**

- NR-2.1 Assess the role that the atmosphere plays in the regulation of natural cycles (nitrogen, water, carbon, etc.)
- NR-2.2 Assess the causes (e.g. human, natural, etc.) and impacts of climate change, and discuss strategies to lessen its impact on natural resource systems
- NR-2.3 Identify aquatic systems (e.g. wetlands, watersheds, riparian zones, etc.) and evaluate their role in ecosystem function
- NR-2.4 Analyze how ground and surface water quality and quantity affect ecosystem function
- NR-2.5 Describe the stages of ecological succession
- NR-2.6 Analyze and summarize examples of habitat disturbances and habitat resilience
- NR-2.7 Compare and contrast techniques associated with sustainable forestry (e.g., timber stand improvement, diversity improvement, reforestation, etc.) to develop a management plan
- NR-2.8 Compare and contrast techniques associated with soil management (e.g., soil survey and interpretation, erosion control, etc.) to develop a management plan (e.g. erosion control, maximizing biodiversity, plant productivity, soil health, etc.)
- NR-2.9 Comprehend and apply ecological concepts (e.g. population ecology, population density and population dispersion, etc.) to living organisms in natural resource systems

- NR-2.10 Analyze factors that influence the establishment and spread of invasive species, evaluate their impact, and determine the appropriate steps to prevent or minimize the impact of invasive species

**Domain: Humans and Natural Resources**

**Core Standard 3:** Students analyze interrelationships between humans and natural resources.

**Standards**

- NR-3.1 Identify the history and specific purpose of agencies (e.g. SWCD, NRCS, USDA, FSA, etc.) and laws associated with natural resources systems on local, state, and national levels (e.g., water regulations, game laws, historic preservation laws, environmental policy, etc.)
- NR-3.2 Evaluate the impact and effectiveness of agencies associated with natural resources systems
- NR-3.3 Assess and explain how different kinds of human activity (e.g., agriculture, industry, transportation, etc.) affect the use and availability of natural resources (soil, minerals, wildlife, water, etc.)
- NR-3.4 Discuss causes and solutions of species extinction and the importance of biodiversity
- NR-3.5 Analyze how social considerations can affect the use and sustainability of natural resources such as wind turbines, solar panel farms, and hydro-electric dams
- NR-3.6 Examine and explain how economics affect the exploitation, conservation, and preservation of natural resources
- NR-3.7 Develop strategies and materials to communicate information to the public regarding topics related to the management, protection, enhancement, and improvement of natural resources

**Domain: Utilization of Natural Resources**

**Core Standard 4:** Students examine sustainable production, processing, and use of natural resources.

**Standards**

- NR-4.1 Assess the sustainable production, harvesting, processing and use of plant, animal, and aquatic wildlife species
- NR-4.2 Assess the sustainable extraction, processing and use of minerals and fossil fuels

NR-4.3 Identify, assess, and apply the uses of natural resources for outdoor recreation opportunities

**Domain: Maintenance and Protection**

**Core Standard 5:** Students demonstrate responsible management procedures and techniques to protect, maintain, enhance, and improve natural resources.

**Standards**

NR-5.1 Identify and assess methods (e.g. fire, grazing, harvesting, plantings, etc.) used to manage and improve forests, rangeland, wildlife habitat, and the biological health of streams

NR-5.2 Identify and assess management techniques for improving outdoor recreation opportunities

NR-5.3 Identify, assess, and apply the uses of natural resources for outdoor recreation opportunities

NR-5.4 Demonstrate geospatial skills, tools and technologies to aid in developing, implementing and evaluating natural resource management plans (land surveys, geographic coordinate systems, GIS data, etc.)

NR-5.5 Identify and discuss ecologically harmful species and diseases

**Domain: Safety**

**Core Standard 6:** Students develop a safety plan for work and recreation within natural resources.

**Standards**

NR-6.1 Demonstrate safety practices when working in an outdoor environment

NR-6.2 Use proper safety practices/personal protective equipment when working with natural resources for work and recreation

NR-6.3 Identify and utilize proper safety practices and personal protective equipment in laboratory settings

**Domain - Careers**

**Core Standard 7** Students examine the scope of career opportunities in and the importance of agriculture to the economy.

**Standards**

NR-7.1 Evaluate the nature and scope of natural resources in agriculture, society, and the economy

- NR-7.2 Describe career opportunities and means to achieve those opportunities in natural resources
- NR-7.3 Identify how key organizational structures and processes affect organizational performance and the quality of products and services
- NR-7.4 Demonstrate those qualities, attributes and skills necessary to succeed in, or further prepare for, a chosen career while effectively contributing to society

### **Domain - Leadership**

**Core Standard 8** Students validate the necessity of leadership skills development in conjunction with participation in The National FFA Organization (FFA) as a critical component to a well-rounded agricultural education.

#### **Standards**

- NR-8.1 Communicate clearly, effectively, and with reason through speaking, writing, visuals, and active listening in formal and informal settings
- NR-8.2 Recognize and explain the role of the FFA in the development of leadership, education, employability, communications and human relations skills
- NR-8.3 Examine roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment
- NR-8.4 Acquire the skills necessary to positively influence others
- NR-8.5 Develop a skill set to enhance the positive evolution of the whole person

### **Domain - Supervised Agriculture Experience**

**Core Standard 9** Students validate the necessity of a Supervised Agricultural Experience (SAE) program as a critical component to a well-rounded agricultural education.

#### **Standards**

- NR-9.1 Explain the nature of and become familiar with those terms related to an SAE program
- NR-9.2 Explore the numerous possibilities for an SAE program which a student might develop
- NR-9.3 Develop an individual SAE program and implementation plan for record keeping skills