

Environmental Science and Natural Resources

ACADEMIC SKILLS

AA SPEAKING AND LISTENING

AA1 Utilize effective verbal and non-verbal communication skills

AA2 Participate in conversation, discussion and group presentations

AA3 Communicate and follow directions/procedures

AA4 Utilize speaking and listening skills to communicate effectively with customers and co-workers

AB READING AND WRITING

AB1 Locate and interpret written information

AB2 Read and interpret workplace documents, e.g., reports, manuals, schematics, flowcharts, tables, graphs

AB3 Identify relevant details, facts and specifications

AB4 Record information accurately and completely

AB5 Demonstrate competence in organizing, writing and editing using correct vocabulary, spelling, grammar and punctuation

AB6 Demonstrate the ability to write clearly and concisely using industry-specific terminology

AC CRITICAL THINKING AND PROBLEM SOLVING

AC1 Utilize critical-thinking skills to determine best options/outcomes, e.g., analyze reliable/unreliable sources of information, use previous experiences, implement crisis management, develop contingency planning

AC2 Utilize innovation and problem-solving skills to arrive at the best solution for the current situation

AC3 Implement effective decision-making skills

AD MATHEMATICS

AD1 Perform basic and higher-level math operations, e.g., addition, subtraction, multiplication, division, decimals, fractions, units of conversion, averaging, percentage, proportion, ratios, numbering systems

AD2 Solve problems using measurement skills, e.g., distance, weight, area, volume

AD3 Make reasonable estimates

AD4 Use tables, graphs, diagrams and charts to obtain or convey information

AD5 Use reasoning and problem-solving skills in mathematics

AE FINANCIAL LITERACY

AE1 Locate, evaluate and apply personal financial information

AE2 Identify the components of a budget and how one is created

AE3 Set personal financial goals and develop a plan for achieving them

AE4 Describe types of financial service providers and considerations in selecting a provider

AE5 Demonstrate ability to meet financial obligations

AF INTERNET USE AND SECURITY

AF1 Recognize the potential risks associated with internet and social media use

AF2 Identify and apply internet security practices, e.g., password security, login, logout, log off, lock computer

AF3 Practice safe, legal and responsible use of technology in the workplace

AG INFORMATION TECHNOLOGY

AG1 Use technology appropriately to enhance professional presentations

AG2 Demonstrate effective, appropriate and ethical use of social media

AG3 Identify ways social media can be used as marketing, advertising and data gathering tools

AH TELECOMMUNICATIONS

AH1 Select and utilize the appropriate environment, devices, services and applications to complete workplace tasks

AH2 Demonstrate appropriate etiquette when using telecommunications, e.g., cell phone, e-mail, messaging services, online meetings, conference calls

EMPLOYABILITY SKILLS

EA POSITIVE WORK ETHIC

EA1 Explain the importance of pride and confidence about work and learning new tasks

EA2 Demonstrate consistent and punctual attendance

EA3 Demonstrate initiative in assuming tasks

EA4 Exhibit dependability in the workplace

EA5 Take and provide direction in the workplace

EA6 Accept responsibility for personal decisions and actions

EB INTEGRITY

EB1 Abide by workplace policies and procedures, e.g., safety, internet and cell phone use, code of conduct

EB2 Demonstrate honesty and reliability

EB3 Demonstrate ethical characteristics and behaviors

EB4 Maintain confidentiality and integrity of company information

EB5 Support the mission and vision of the company

EC SELF-REPRESENTATION

EC1 Demonstrate appropriate dress and hygiene in the workplace

EC2 Use language and manners suitable for the workplace

EC3 Demonstrate polite and respectful behavior toward others

ED TIME, TASK AND RESOURCE MANAGEMENT

ED1 Plan and follow a work schedule

ED2 Complete work tasks successfully with minimal supervision

ED3 Work successfully within budgetary constraints

ED4 Demonstrate ability to stay on task to produce high-quality deliverables on time

EE DIVERSITY AWARENESS

EE1 Define and differentiate diversity, equity, inclusion, discrimination and harassment

EE2 Work effectively with all customers and co-workers

EE3 Explain the benefits of diversity within the workplace

EE4 Explain the importance of respect for the feelings, values and beliefs of others

EE5 Identify strategies to bridge cultural/generational differences and use differing perspectives to increase the overall quality of work

EE6 Illustrate techniques for eliminating bias and stereotyping in the workplace

EE7 Identify ways tasks can be structured to accommodate the diverse needs of workers

EE8 Recognize the challenges and advantages of a global workforce

EF TEAMWORK

EF1 Recognize the characteristics of a team environment and conventional workplace

EF2 Demonstrate effective team skills, e.g., setting goals, listening, following directions, questioning, dividing work, conflict resolution, meeting facilitation, and evaluate their importance in the workplace

EG CREATIVITY AND RESOURCEFULNESS

EG1 Explain the importance of contributing and conveying new ideas in the workplace

EG2 Describe the importance of posing questions when developing ideas

EG3 Explain the value of varying ideas and opinions

EG4 Locate and verify information during the creative process

EH CONFLICT RESOLUTION

EH1 Identify conflict resolution skills to enhance productivity and improve workplace relationships

EH2 Implement conflict resolution strategies and problem-solving skills

EH3 Explain the use of documentation and its role as a component of conflict resolution

EI CUSTOMER/CLIENT SERVICE

EI1 Recognize the importance of and demonstrate how to properly greet/approach customers and clients

EI2 Identify and address needs of customers/clients

EI3 Provide helpful, courteous and knowledgeable service

EI4 Identify appropriate channels of communication with customers/clients, e.g., online, phone call, face-to-face

EI5 Identify techniques to seek and use customer/client feedback to improve company services

EI6 Explain the relationship between customer/client satisfaction and company success

EJ ORGANIZATIONS, SYSTEMS AND CLIMATES

EJ1 Define profit and identify factors affecting the profitability of a business

EJ2 Identify "big picture" issues in conducting business, e.g., forecasting, global market, risk management

EJ3 Identify roles in fulfilling the mission of the workplace

EJ4 Identify the rights of workers, e.g., adult and child labor laws, and other equal employment opportunity laws

EJ5 Recognize the chain of command, organizational flow chart system and hierarchy of management within an organization

EK JOB ACQUISITION AND ADVANCEMENT

EK1 Recognize the importance of maintaining a job and pursuing a career

EK2 Define jobs associated with a specific career path or profession

EK3 Identify and seek various work experience opportunities, e.g., volunteerism, internships, co-op, part-time/full-time employment

EK4 Prepare a resume, cover letter and job application

EK5 Prepare for and participate in a job interview, e.g., research company, highlight personal strengths, prepare questions, conduct a mock interview, dress appropriately

EK6 Explain the components of a successful job interview

EK7 Identify key factors to evaluate employment offers, e.g., salary, benefits packages

EK8 Explain the proper procedure for leaving a job

EL LIFELONG LEARNING

EL1 Acquire current and emerging industry-related information

EL2 Demonstrate commitment to learning as a life-long process and recognize learning opportunities

EL3 Identify various self-improvement opportunities

EL4 Explain the importance of adaptability in career planning and self-management, e.g., diverse portfolio, credentials, professional development

EL5 Employ leadership skills to achieve workplace objectives, e.g., personal vision, adaptability, change, shared vision

EL6 Recognize the importance of job performance evaluation and coaching as it relates to career advancement

EL7 Accept and provide constructive criticism

EL8 Describe the impact of the global economy on jobs and careers

EM JOB SPECIFIC TECHNOLOGIES

EM1 Identify the value of new technologies and their impact on driving continuous change and the need for lifelong learning

EM2 Research and identify emerging technologies for specific careers

EM3 Select appropriate technological resources to accomplish work

EN HEALTH AND SAFETY

EN1 Identify and assume responsibility for the safety of self and others

EN2 Follow safety guidelines in the workplace, e.g., OSHA, CDC

EN3 Explain the impact of personal health and wellness on job performance

OCCUPATIONAL SKILLS

OA USE ANALYTICAL PROCEDURES AND INSTRUMENTS TO MANAGE ENVIRONMENTAL AND NATURAL RESOURCE SYSTEM ACTIVITIES

OA1 Identify sample types and sampling techniques in soil, water, wildlife survey, microorganisms and pollution

OA2 Determine the appropriate chemical and physical sampling techniques to generate an unbiased statistical data analysis

OA3 Analyze and interpret results of sample measurements

OA4 Demonstrate the proper use of laboratory equipment and environmental monitoring instruments, e.g., microscopes, water/soil testing kits, Biltmore stick, clinometer

OB EVALUATE THE IMPACT OF PUBLIC POLICIES AND REGULATIONS ON ENVIRONMENTAL SERVICES AND NATURAL RESOURCE OPERATIONS

OB1 Identify laws associated with environmental service and natural resources systems, e.g., Endangered Species, Clean Water, timber harvest regulations

OB2 Identify production agricultural practices that enhance natural resources

OB3 Discuss agricultural practices that negatively impact the environment and natural resources

OB4 Discuss issues currently associated with Natural Resources/Environmental Science systems, e.g., water regulations, technologies, owner rights, endangered species

OC DEVELOP PROPOSED SOLUTIONS TO ENVIRONMENTAL ISSUES, PROBLEMS AND APPLICATIONS USING SCIENTIFIC PRINCIPLES OF METEOROLOGY, SOIL SCIENCE, HYDROLOGY, MICROBIOLOGY, CHEMISTRY AND ECOLOGY

OC1 Describe the impact of Kentucky's climate change and weather patterns have on natural resources

OC2 Explain the importance of parent material in soil formation

OC3 Describe how the biodiversity found in soil contributes to its physical and chemical characteristics

OC4 Describe the physical qualities of soil, e.g., infiltration, percolation of water, plant growth, erosion, that determines its use for environmental/natural resources

OC5 Evaluate the land capability classes for parcels of land in an area

OC6 Differentiate between sustainable and non-sustainable land uses

OC7 Describe the world's water supplies and the uses of it in the biosphere to sustain life

OC8 Describe properties of local watersheds

- OC9 Describe the relationship of watersheds to natural resources
- OC10 Analyze ecosystem functions of a watershed
- OC11 Compare and contrast interactions of groundwater and surface water flow
- OC12 Explain stream and karst hydrology/structure
- OC13 Describe the function of riparian zones/buffers
- OC14 Identify techniques used in the creation, enhancement and management of riparian zones and riparian buffers
- OC15 Identify environmental hazards associated with groundwater supplies
- OC16 Describe precautions taken to prevent/reduce contamination of groundwater supplies
- OC17 Describe the functions of various types of wetlands
- OC18 Identify the major types of living organisms that inhabit wetlands
- OC19 Identify techniques used in wetland management, creation, enhancement and restoration programs
- OC20 Distinguish the characteristics of inorganic and organic compounds
- OC21 Describe basic structures of microorganisms, e.g., major groups and their impact

OD DEMONSTRATE THE OPERATION OF ENVIRONMENTAL SERVICE AND NATURAL RESOURCE SYSTEMS

- OD1 Distinguish between point source and nonpoint source pollution
- OD2 Describe how industrial and non-industrial pollution impacts the environment
- OD3 Describe ways in which pollution can be managed and prevented
- OD4 Identify characteristics of solid waste treatment including the byproducts of solid waste treatment in a sanitary landfill
- OD5 Evaluate environmental hazards created by different types of solid waste, accumulation, disposal and storage
- OD6 Explain scientific principles related to composting
- OD7 Describe recycling methods based on the material to be recycled locally
- OD8 Illustrate the steps in public drinking water treatment process
- OD9 Diagram the steps in wastewater treatment

OE PLAN AND CONDUCT NATURAL RESOURCE MANAGEMENT ACTIVITIES THAT APPLY LOGIC, REASONED AND SCIENTIFICALLY BASED SOLUTIONS TO NATURAL RESOURCE ISSUES AND GOALS

OE1 Demonstrate how to use maps to identify directions, features, calculate actual distance and determine the elevations of points

OE2 Locate natural resources using a land survey and geographic coordinate system

OE3 Employ Global Positioning System and Geographic Information Systems technologies to inventory features in natural resource management

OE4 Demonstrate surveying/mapping principles with appropriate industry equipment

OF ANALYZE INTERRELATIONSHIPS BETWEEN NATURAL RESOURCES AND HUMANS NEEDED TO MANAGE NATURAL RESOURCE SYSTEMS

OF1 Identify trees and other woody plants using morphological characteristics

OF2 Identify herbaceous plants using morphological characteristics

OF3 Identify wildlife species using morphological characteristics

OF4 Identify aquatic species using morphological characteristics

OF5 Identify rock, mineral and soil types

OF6 Identify hazards associated with the outdoor environment, e.g., wildlife, weather

OF7 Demonstrate safety practices when working in an outdoor environment

OF8 Demonstrate proper use and maintenance of power and hand tools

OF9 Describe the factors considered in stream classification

OF10 Identify indicators of the biological health of a stream

OF11 Identify characteristics of a healthy forest

OF12 Describe ways in which forest stands may be improved

OF13 Identify characteristics of a healthy wildlife habitat

OF14 Describe methods of wildlife habitat improvement

OF15 Identify natural resource characteristics desirable for recreational purposes

OF16 Identify natural resource management techniques for improving recreation opportunities

OF17 Diagram biogeochemical cycles, e.g., carbon, nitrogen, oxygen, water, and their processes

OF18 Determine the human influence on biogeochemical cycles

OF19 Explain primary succession and secondary succession of species in a community of organisms

OF20 Discuss factors that influence population density and population dispersion

OF21 Conduct a field inventory of natural resources, e.g., trees, woody plants, herbaceous plants, wildlife, aquatics, rocks/minerals, and record/document findings

OG DEVELOP PLANS TO ENSURE RESPONSIBLE AND SUSTAINABLE PRODUCTION AND PROCESSING OF NATURAL RESOURCES

OG1 Describe forest harvesting methods and practices

OG2 Describe how certain tree species are utilized for specific purposes

OG3 Describe processing of forest products, e.g., lumber, pulpwood, firewood

OG4 Describe techniques used in the sustainable harvesting of wildlife

OG5 Identify products obtained from wildlife species

OG6 Describe techniques used in the processing of wildlife

OG7 Identify aquatic species harvested for commercial and recreational purposes

OG8 Describe techniques used to harvest/process aquatic species

OG9 Describe economically important minerals and ores that are extracted and processed

OG10 Describe renewable and nonrenewable natural resources

OG11 Identify conventional energy sources, e.g., fossil fuels, hydroelectric, nuclear

OG12 Debate the merits of conventional and alternative energy sources

OG13 Describe sources of fossil fuels, extraction processes and products made from fossil fuels

OG14 Describe the benefits and drawbacks of non-fossil fuel generation

OH DEMONSTRATE RESPONSIBLE CONTROL AND MANAGEMENT PROCEDURES AND TECHNIQUES TO PROTECT AND MAINTAIN NATURAL RESOURCES

OH1 Identify invasive species including factors encouraging their establishment/spread

OH2 Differentiate between desirable and undesirable fires

OH3 Describe techniques used to suppress wildfires and manage prescribed fires

OH4 Explain management techniques used to reduce infection and spread of common plant disease in natural resources

OH5 Describe management techniques for common wildlife diseases

OH6 Describe techniques used to manage pests of natural resources

OH7 Identify harmful insects and damage caused to natural resources

OH8 Describe how to report diseases or pests affecting wildlife and/or plants to the appropriate authorities

OH9 Identify beneficial insects and their role in supporting natural resources