Kentucky CTE

Plant Science Systems (2023)

ACADEMIC SKILLS

AA. SPEAKING AND LISTENING AA

1. Utilize effective verbal and non-verbal communication skills AA1
2. Participate in conversation, discussion and group presentations AA2
3. Communicate and follow directions/procedures AA3
4. Utilize speaking and listening skills to communicate effectively with customers and co-workers AA4

AB. READING AND WRITING AB

1. Locate and interpret written information AB1
2. Read and interpret workplace documents, e.g., reports, manuals, schematics, flowcharts, tables, graphs AB2
3. Identify relevant details, facts and specifications AB3
4. Record information accurately and completely AB4
5. Demonstrate competence in organizing, writing and editing using correct vocabulary, spelling, grammar and punctuation AB5
6. Demonstrate the ability to write clearly and concisely using industry-specific terminology AB6

AC. CRITICAL THINKING AND PROBLEM SOLVING AC

1. 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 AC1
2. Utilize innovation and problem-solving skills to arrive at the best solution for the current situation AC2
3. Implement effective decision-making skills AC3

AD. MATHEMATICS AD

1. Perform basic and higher-level math operations, e.g., addition, subtraction, multiplication, division, decimals, fractions, units of conversion, averaging, percentage, proportion, ratios, numbering systems AD1
2. Solve problems using measurement skills, e.g., distance, weight, area, volume AD2
3. Make reasonable estimates AD3
4. Use tables, graphs, diagrams and charts to obtain or convey information AD4

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5 Use reasoning and problem-solving skills in mathematics AD5

AE. FINANCIAL LITERACY AE

1 Locate, evaluate and apply personal financial information AE1

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

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

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

5 Demonstrate ability to meet financial obligations AE5

AF. INTERNET USE AND SECURITY AF

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

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

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

AG. INFORMATION TECHNOLOGY AG

1 Use technology appropriately to enhance professional presentations AG1

2 Demonstrate effective, appropriate and ethical use of social media AG2

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

AH. TELECOMMUNICATIONS AH

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

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

EMPLOYABILITY SKILLS

EA. POSITIVE WORK ETHIC EA

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

2 Demonstrate consistent and punctual attendance EA2

3 Demonstrate initiative in assuming tasks EA3

4 Exhibit dependability in the workplace EA4

5 Take and provide direction in the workplace EA5

6 Accept responsibility for personal decisions and actions EA6

EB. INTEGRITY EB

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

2 Demonstrate honesty and reliability EB2

3 Demonstrate ethical characteristics and behaviors EB3

4 Maintain confidentiality and integrity of company information EB4

5 Support the mission and vision of the company EB5

EC. SELF-REPRESENTATION EC

1 Demonstrate appropriate dress and hygiene in the workplace EC1

2 Use language and manners suitable for the workplace EC2

3 Demonstrate polite and respectful behavior toward others EC3

ED. TIME, TASK AND RESOURCE MANAGEMENT ED

1 Plan and follow a work schedule ED1

2 Complete work tasks successfully with minimal supervision ED2

3 Work successfully within budgetary constraints ED3

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

EE. DIVERSITY AWARENESS EE

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

2 Work effectively with all customers and co-workers EE2

3 Explain the benefits of diversity within the workplace EE3

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

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

6 Illustrate techniques for eliminating bias and stereotyping in the workplace EE6

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

8 Recognize the challenges and advantages of a global workforce EE8

EF. TEAMWORK EF

1 Recognize the characteristics of a team environment and conventional workplace EF1

2 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 EF2

EG. CREATIVITY AND RESOURCEFULNESS EG

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

2 Describe the importance of posing questions when developing ideas EG2

3 Explain the value of varying ideas and opinions EG3

4 Locate and verify information during the creative process EG4

EH. CONFLICT RESOLUTION EH

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

2 Implement conflict resolution strategies and problem-solving skills EH2

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

EI. CUSTOMER/CLIENT SERVICE EI

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

2 Identify and address needs of customers/clients EI2

3 Provide helpful, courteous and knowledgeable service EI3

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

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

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

EJ. ORGANIZATIONS, SYSTEMS AND CLIMATES EJ

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

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

3 Identify roles in fulfilling the mission of the workplace EJ3

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

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

EK. JOB ACQUISITION AND ADVANCEMENT EK

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

2 Define jobs associated with a specific career path or profession EK2

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

4 Prepare a resume, cover letter and job application EK4

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

6 Explain the components of a successful job interview EK6

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

8 Explain the proper procedure for leaving a job EK8

EL. LIFELONG LEARNING EL

1 Acquire current and emerging industry-related information EL1

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

3 Identify various self-improvement opportunities EL3

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

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

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

7 Accept and provide constructive criticism EL7

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

EM. JOB SPECIFIC TECHNOLOGIES EM

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

2 Research and identify emerging technologies for specific careers EM2

3 Select appropriate technological resources to accomplish work EM3

EN. HEALTH AND SAFETY EN

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

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

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

OCCUPATIONAL SKILLS

OA. ENVIRONMENTAL FACTORS, GROWING MEDIA AND PLANT NUTRIENTS OA

1 Describe how soil is formed and the horizon layers resulting from the formation OA1

2 Describe the proper methods to collect soil samples OA2

3 Analyze site according to soil type, slope and drainage OA3

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4 Differentiate the function of various growing media components, e.g., peat, Perlite, Vermiculite OA4

5 Determine the relationship of optimal air, temperature and water conditions on plant growth 0A5

6 Summarize the three measurements of light - color, intensity and duration - that affect plant growth 0A6

7 Describe pH, its impact on nutrient availability and how to adjust the pH of growing media 0A7

8 Examine the importance of macronutrients and micronutrients to plant growth 0A8

9 Identify the essential nutrients for plant growth and development and their major functions, e.g., nitrogen, phosphorus, potassium 0A9

10 Calculate the amount of fertilizer to be applied based on nutrient recommendation and fertilizer analysis 0A10

0B. PRINCIPLES OF CLASSIFICATION, ANATOMY AND PHYSIOLOGY IN PLANT PRODUCTION 0B

1 Explain how the binomial nomenclature system is used to classify plants, including the naming of cultivars 0B1

2 Describe the morphological characteristics used to identify agricultural and herbaceous plants, e.g., life cycles, growth habitat, plant use, monocotyledons or dicotyledons, woody, herbaceous 0B2

3 Identify structures in a typical plant cell and their functions 0B3

4 Describe the components, types and functions of plant roots 0B4

5 Describe the components, types and functions of plant stems 0B5

6 Describe the components, types and functions of plant leaves 0B6

7 Describe the components, types and functions of plant flowers 0B7

8 Describe the components, types and functions of seeds and fruit 0B8

9 Analyze the life cycle of plant growth/development from seed to seed, e.g., annual, biennial, perennial, cool vs. warm season 0B9

10 Identify common agronomic crops grown in Kentucky, e.g., corn, wheat, soybeans 0B10

11 Identify common bedding and nursery crops grown in Kentucky, e.g., marigold, petunia, boxwood, hosta 0B11

12 Explain requirements necessary for photosynthesis to occur and identify the products and byproducts of photosynthesis 0B12

13 Explain factors that affect cellular respiration and identify the products and byproducts of cellular respiration 0B13

0C. PROPAGATE, CULTURE AND HARVEST PLANTS AND PLANT PRODUCTS 0C

1 Describe how to safely operate equipment utilized in plant production 0C1

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2 Explain the importance of equipment cleaning/sanitation in plant production 0C2

3 Explain how to safely handle and apply chemicals OC3

4 Utilize industry-appropriate selection techniques for crop varieties/cultivars, e.g., yield, germination, disease tolerance, growing season OC4

5 Analyze seed tag information in crop selection, e.g., germination rate, seeding rate, variety, live seed OC5

6 Determine proper techniques to control and manage plant growth through biological, chemical, cultural and mechanical means OC6

7 Describe the purpose of plant growth regulators OC7

8 Differentiate various watering technologies and methods, e.g., hand, drip, overhead sprinkler, moisture sensors OC8

9 Explain methods used for asexual plant propagation, e.g., cuttings, division, separation, layering, budding, grafting OC9

10 Describe examples of sexual reproduction in flowering plants, e.g., pollination, cross-pollination, self-pollination OC10

11 Explain the purpose of an integrated pest management plan and the components it contains, e.g., action threshold, monitor/identify pests, prevention, control OC11

12 Identify the characteristics of major insect pests in Kentucky, e.g., mouth parts, economic impact, life cycle OC12

13 Identify major plant disorders in Kentucky and their mitigation strategies, e.g., rust, leaf blight, powdery mildew OC13

14 Identify the major invasive weeds found in Kentucky and their mitigation strategies, e.g., johnsongrass, bull thistle, crabgrass, pigweed OC14

15 Predict pest and diseases problems based on environmental conditions and life cycles OC15

16 Identify appropriate techniques for harvesting and storage of crops grown in Kentucky, e.g., machinery, hand tools, hand harvest, grain bins, coolers OC16

OD. APPLY PRINCIPLES OF DESIGN IN PLANT SYSTEMS TO ENHANCE THE ENVIRONMENT OD

1 Describe principles and elements of design that form the basis of artistic impression, e.g., line, form, texture, color OD1

2 Discuss the applications of design in agriculture and ornamental plant systems OD2

3 Identify tools used for design, e.g., drawing tools, florist tools, landscape design software OD3

OE. SUSTAINABLE AGRICULTURE PRACTICES IN PLANT PRODUCTION OE

1 Discuss how imports and exports impact the agriculture markets in the US and abroad OE1

2 Interpret how crop production varies based on geographic location within Kentucky and the US, and the economic impact therein OE2

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3 Describe the purpose of plant patents in the agricultural industry 0E3

4 Generalize how GMOs impact the agriculture industry 0E4

5 Identify current technology used in crop production, e.g., plant genetics, biotechnology, GPS, remote sensors 0E5

6 Distinguish roles and responsibilities of state and federal government agencies as they impact crop production, e.g., Kentucky Department of Agriculture, USDA, FDA 0E6

7 Discuss the impact of environmental issues on crop production, e.g., surface or groundwater, erosion, drift, chemical residue, runoff, water testing 0E7

8 Generalize strategies related to the marketing of crop, e.g., futures and forward cash contracts 0E8

9 Develop planning, production, maintenance and harvest schedules for Kentucky crops 0E9

OF. UTILIZE SOUND BUSINESS PRACTICES IN PLANT PRODUCTION 0F

1 Apply effective record keeping skills including financial records 0F1

2 Discuss the purpose and components of a marketing plan, e.g., goals, target audience, strategies, budget, timeline 0F2

3 Assess methods to determine target audience and products for a business 0F3

4 Define enterprise budget, fixed cost, variable cost and cash flow as they relate to plant production 0F4

5 Discuss the major issues related to labor management, e.g., H2-A, OSHA, insurance 0F5