

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
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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
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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
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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

- 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**

- 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**
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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**
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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**
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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**
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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**
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EG. CREATIVITY AND RESOURCEFULNESS **EG**

- 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
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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
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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, face-to-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
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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
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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

- 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**
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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**
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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**
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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**
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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**
- 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 OA5
 - 6 Summarize the three measurements of light - color, intensity and duration - that affect plant growth OA6
 - 7 Describe pH, its impact on nutrient availability and how to adjust the pH of growing media OA7
 - 8 Examine the importance of macronutrients and micronutrients to plant growth OA8
 - 9 Identify the essential nutrients for plant growth and development and their major functions, e.g., nitrogen, phosphorus, potassium OA9
 - 10 Calculate the amount of fertilizer to be applied based on nutrient recommendation and fertilizer analysis OA10
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OB. PRINCIPLES OF CLASSIFICATION, ANATOMY AND PHYSIOLOGY IN PLANT PRODUCTION OB

- 1 Explain how the binomial nomenclature system is used to classify plants, including the naming of cultivars OB1
 - 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 OB2
 - 3 Identify structures in a typical plant cell and their functions OB3
 - 4 Describe the components, types and functions of plant roots OB4
 - 5 Describe the components, types and functions of plant stems OB5
 - 6 Describe the components, types and functions of plant leaves OB6
 - 7 Describe the components, types and functions of plant flowers OB7
 - 8 Describe the components, types and functions of seeds and fruit OB8
 - 9 Analyze the life cycle of plant growth/development from seed to seed, e.g., annual, biennial, perennial, cool vs. warm season OB9
 - 10 Identify common agronomic crops grown in Kentucky, e.g., corn, wheat, soybeans OB10
 - 11 Identify common bedding and nursery crops grown in Kentucky, e.g., marigold, petunia, boxwood, hosta OB11
 - 12 Explain requirements necessary for photosynthesis to occur and identify the products and byproducts of photosynthesis OB12
 - 13 Explain factors that affect cellular respiration and identify the products and byproducts of cellular respiration OB13
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OC. PROPAGATE, CULTURE AND HARVEST PLANTS AND PLANT PRODUCTS OC

- 1 Describe how to safely operate equipment utilized in plant production OC1
- 2 Explain the importance of equipment cleaning/sanitation in plant production OC2

- 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**

- 3 Describe the purpose of plant patents in the agricultural industry **OE3**
 - 4 Generalize how GMOs impact the agriculture industry **OE4**
 - 5 Identify current technology used in crop production, e.g., plant genetics, biotechnology, GPS, remote sensors **OE5**
 - 6 Distinguish roles and responsibilities of state and federal government agencies as they impact crop production, e.g., Kentucky Department of Agriculture, USDA, FDA **OE6**
 - 7 Discuss the impact of environmental issues on crop production, e.g., surface or groundwater, erosion, drift, chemical residue, runoff, water testing **OE7**
 - 8 Generalize strategies related to the marketing of crop, e.g., futures and forward cash contracts **OE8**
 - 9 Develop planning, production, maintenance and harvest schedules for Kentucky crops **OE9**
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OF. UTILIZE SOUND BUSINESS PRACTICES IN PLANT PRODUCTION **OF**

- 1 Apply effective record keeping skills including financial records **OF1**
- 2 Discuss the purpose and components of a marketing plan, e.g., goals, target audience, strategies, budget, timeline **OF2**
- 3 Assess methods to determine target audience and products for a business **OF3**
- 4 Define enterprise budget, fixed cost, variable cost and cash flow as they relate to plant production **OF4**
- 5 Discuss the major issues related to labor management, e.g., H2-A, OSHA, insurance **OF5**