ARIZONA CTE CAREER PREPARATION STANDARDS & MEASUREMENT CRITERIA

PLANT SYSTEMS, 01.0100.30	
1.0	**DEMONSTRATE LABORATORY PROCEDURES AND SAFETY PRACTICES**
1.1	Demonstrate safe practices in a home, classroom, laboratory, and work situation
1.2	Identify safety precautions that involve working with hazardous biological materials
1.3	Examine the impact of safety compliance on business and employees
1.4	Interpret parts of an MSDS sheet
1.5	Interpret recommended personal protection equipment (PPE)
1.6	Safely operate and maintain equipment
2.0	**DESCRIBE CELL BIOLOGY STRUCTURES AND PROCESSES**
2.1	Explore the cells, tissues, and organs
2.2	Recognize the structure and function of DNA
2.3	Explain the process of creating proteins from DNA
2.4	Explain the role of the cell and cellular processes (i.e. , mitosis, meiosis, osmosis)
2.5	Examine the molecular basis of heredity and resulting genetic diversity
2.6	Specify methods and requirements by which an organism's genetic code can be altered using biotechnology techniques
2.7	Determine how scientists continue to investigate and critically analyze DNA cloning
2.8	Outline the scientific principles and processes involved in biological evolution
3.0	**DESCRIBE BASIC PRINCIPLES OF NUTRITION**
3.1	Determine the essential nutrients for organisms and describe their importance
3.2	Explore the nutritional needs of humans, animals and/or plants
3.3	Explain the process of food digestion and nutrient absorption
3.4	Identify common nutrition problems
4.0	**DESCRIBE SCIENTIFIC CLASSIFICATION**
4.1	Investigate the seven levels of classifications (Kingdom, Division, Class, Order, Family, Genus, Species)
4.2	Investigate the five kingdoms (Bacteria, Protists, Fungi, Plants, Animals)
4.3	Create and utilize a dichotomous key
5.0	**DESCRIBE PRINCIPLES OF PLANT GROWTH AND PRODUCTION**
5.1	Identify parts of plants and their functions
5.2	Explore methods of classifying plants
5.3	Recognize the physiological needs of plants
5.4	Explain plant sexual and asexual reproduction
5.5	Demonstrate plant propagation
6.0	**DESCRIBE PRINCIPLES OF ANIMAL GROWTH AND PRODUCTION**
6.1	Describe the epidermis system
6.2	Describe the musculoskeletal system
6.3	Describe the nervous system
6.4	Describe the circulatory system
6.5	Describe the respiratory system
6.6	Describe the digestive system
6.7	Describe the urinary system
6.8	Describe the reproductive system
6.9	Describe the endocrine system
6.10	Recognize the physiological needs of living animals

6.11	Explore animal health control practices
6.12	Explain animal reproduction practices
6.13	Explore benefits to health care that have resulted from advances in technology
7.0	**USE SCIENTIFIC PROCESSES TO ANALYZE DATA**
7.1	Formulate predictions, questions, or hypotheses based on observations
7.2	Evaluate appropriate resources for research
7.3	Illustrate the scientific method
7.4	Design and conduct controlled investigations
7.5	Design data tables, charts, and graphs
7.6	Record observations, notes, sketches, questions, and ideas during the investigation
7.7	Analyze data to explain results and propose further investigations
7.8	Communicate conclusions of investigations
8.0	**DESCRIBE THE PRINCIPLES OF ECOLOGY & ENVIRONMENTAL SCIENCE**
8.1	Analyze the organization of living systems
8.2	Recognize the role of energy within living systems
8.3	Analyze the symbiotic relationships among various organisms and their environment
8.4	Discuss the different classifications of natural resources in the environment
8.5	Evaluate environmental and natural resource sciences
8.6	Evaluate sustainable agriculture systems
9.0	**DISCUSS BIOTECHNOLOGY**
9.1	Analyze how specific cultural and/or social issues promote or hinder scientific advancements
9.2	Evaluate new agricultural products developed as a result of advances in technology
9.3	Examine the effects of biotechnology on food safety and processing techniques
9.4	Discuss how biotechnology has improved nutrition
9.5	Discuss biotechnology techniques that have contributed to improved health
9.6	Explain how biotechnology has influenced medicines
9.7	Compare the impact of biotechnology on the length and quality of life
9.8	Describe the effects of technology and biotechnology on the environment
9.9	Describe benefits to the environment as a result of advances in technology
9.10	Compare the impact of biotechnology on the production, processing, storage, and preparation of food
9.11	Discuss the effects of plant biotechnology in sustainable agriculture systems
10.0	**DESCRIBE FOOD SAFETY AND PROCESSING PRACTICES**
10.1	Identify food safety practices
10.2	Describe food-processing practices
10.3	Identify new and innovative food products developed as a result of advances in technology
10.4	Investigate food labeling practices
10.5	Compare marketing techniques in the food industry
11.0	**INVESTIGATE ETHICS IN THE AGRICULTURE INDUSTRY**
11.1	Assess ethics in leadership and agricultural production
11.2	Evaluate business dealings with friends, family, or competitors
11.3	Evaluate pricing and sales incentives
11.4	Evaluate potential environmental damage of agriculture practices
11.5	Discuss bioethical issues

12.0	**ANALYZE AGRICULTURAL LITERACY TOPICS**
12.1	Discuss the development of agriculture in America
12.2	Examine Arizona agriculture and its advancements
12.3	Discuss misconceptions in agriculture
12.4	Differentiate between standard operating procedures on commercial, small scale, and organic production techniques
12.5	Describe the facets of agriculture
12.6	Discuss how regulatory agencies affect agriculture
13.0	**INVESTIGATE APPROVED PRACTICES OF DISEASE CONTROL**
13.1	Differentiate between common diseases
13.2	Assess symptoms of common diseases and parasites
13.3	Evaluate economic impact of diseases on production
13.4	Compare methods by which diseases are spread
13.5	Evaluate the most economical and environmentally safe disease control and prevention methods
13.6	Conduct an investigation on an infected field/organism
13.7	Propose corrective actions needed to treat an infected field/organism
14.0	**INVESTIGATE APPROVED NUTRITIONAL PRACTICES**
14.1	Research common nutrient deficiency symptoms and treatment options
14.2	Recommend nutrient and quantity requirements
14.3	Evaluate diagnosis, treatment, and prevention of nutrient deficiency
14.4	Inspect supplemental and additive ration/fertilizer composition
14.5	Prepare samples for testing and diagnosis
14.6	Test methods of fertilizer/nutrient application
14.7	Examine the relationship between nutrient practices and yield amounts
15.0	**ANALYZE THE INTERACTION AMONG ENVIRONMENTAL AND NATURAL RESOURCES SCIENCES**
15.1	Demonstrate how dynamic processes such as weathering, erosion, and sedimentation relate to redistribution of materials in the earth system
15.2	Investigate soil morphology
15.3	Illustrate land-use and water-use planning
15.4	Explain factors that impact current and future water quantity and quality including surface, ground, and local water issues
15.5	Compare fossil fuels and biofuels and how they are affecting the environment
15.6	Describe how human activities and natural causes can lead to pollution
15.7	Evaluate the effectiveness of conservation practices on environmental quality and biodiversity
16.0	**INVESTIGATE IMPACTS OF INTEGRATED PEST MANAGEMENT OPTIONS**
16.1	Classify common pests
16.2	Evaluate economic impact of pests on production
16.3	Predict methods by which pests spread
16.4	Recognize signs of pest damage
16.5	Identify thresholds created for specific pests
16.6	Select and propose the most economical and environmentally safe pest control method
16.7	Identify GMO crops and their role in the agriculture industry
16.8	Read and interpret pesticide labels
16.9	Apply pesticide effectively
17.0	**DEMONSTRATE AGRISCIENCE MECHANIC APPLICATIONS**

17.1	Demonstrate personal and group safety
17.2	Develop a bill of materials for a specific task
17.3	Develop a structural plan for a specific task
17.4	Demonstrate appropriate wood fabrication techniques
17.5	Demonstrate appropriate metal fabrication techniques
17.6	Demonstrate appropriate plumbing fabrication techniques used in agriculture
17.7	Demonstrate appropriate safe connection of electrical components including motors, timers, and values in both high- and low-voltage circuits used in agriculture
17.8	Demonstrate appropriate concrete and masonry practices commonly used in agriculture
17.9	Demonstrate operation and maintenance of appropriate mechanical systems used in agriculture
17.10	Demonstrate appropriate land measurement and construction techniques commonly used in agriculture with technology
17.11	Demonstrate principles and applications of various engines and machinery used in agriculture
18.0	**Apply Business Practices in the Agricultural Industry**
18.1	Determine entrepreneurship opportunities in agriculture
18.2	Develop a marketing plan
18.3	Research a product and demonstrate approved sales techniques
18.4	Apply record keeping principles and applications
18.5	Analyze tax laws and regulations
18.6	Discuss personal and business accounting practices
18.7	Explain economic principles in agriculture
18.8	Utilize technology to accomplish agribusiness objectives
18.9	Research investment opportunities
18.10	Design an agricultural business plan
18.11	Compare projected and actual budgets to calculate business decisions
18.12	Review risk management strategies such as insurance, hedging, and business decisions
19.0	**DEMONSTRATE AN UNDERSTANDING OF THE ROLE OF PLANT SYSTEMS IN THE AGRICULTURAL INDUSTRY**
19.1	Apply knowledge of practices and procedures in Plant Systems
19.2	Apply knowledge of practices and procedures in work-based learning
19.3	Apply knowledge of practices and procedures in leadership development