GACE® Agricultural Education Assessment Test II (041)
Curriculum Crosswalk

	Required Coursework Numbers														
Subarea I. Animal Systems (34%)															
Objective 1: Understands the principles of animal science as related to the agriculture industry															
A. Is familiar with the historical development and trends of the animal systems industry															
• Explains past, current, and emerging trends related to the animal agricultural industry															
• Describes the domestication of animals															
B. Knows the classification, anatomical characteristics, and physiological characteristics of animals															
• Understands the taxonomical classification system of animals															
• Identifies the structure and function of the major body systems of animals; e.g., digestive, reproductive, and respiratory															
• Distinguishes animals by species, use, sex, age, and physical traits															
C. Is familiar with proper health care of animals															
• Describes the use of vaccination and immunization in the animal science industry															
• Selects proper routes of administration of medications and vaccines on various animal species															
• Describes methods of controlling parasites of livestock															

	Required Coursework Numbers														
• Describes noninfectious and infectious diseases and disorders															
• Differentiates between normal and abnormal behavior in common poultry and livestock															
• Identifies causes of abnormal behavior in common poultry and livestock															
D. Knows basic principles of animal nutrition															
• Describes the importance of proper nutrition for animal production															
• Differentiates between ruminant and nonruminant digestion															
• Identifies the major groups of nutrients; e.g., proteins, carbohydrates, and minerals															
• Describes the general principles involved in balancing a ration															
• Calculates a balanced ration, given animal requirements and feed composition, using the Pearson's square method															
E. Is familiar with the principles and practices of basic animal reproduction															
• Defines terminology related to reproductive management and breeding systems, including castration, estrus, gestation, lactation, and parturition															
• Explains the role of the estrus cycle, ovulation, heat detection, and fertilization in animal reproduction management															

	Required Coursework Numbers														
• Identifies practices and principles related to animal reproduction; e.g., artificial insemination, embryo transfer, and selective breeding															
• Describes processes involved in cell division, including how genes affect the transmission of characteristics															
• Completes Punnett square crosses for one-factor and two-factor crosses															
• Defines phenotype and genotype of animals															
Objective 2: Understands animal production, management, and safety															
A. Knows the basic principles of animal production and management															
• Selects market and breeding livestock based on visual assessment															
• Selects animals to cull based on performance data															
• Describes grading systems of livestock; e.g., feeder, quality, and yield															
• Interprets expected progeny differences (EPDs) to make production decisions															
• Describes management procedures needed for effective livestock production; e.g., castration, docking, and dehorning															
• Defines crossbreeding, grading up, inbreeding, linebreeding, and purebred breeding															

	Required Coursework Numbers														
B. Knows safety practices related to animal production															
• Describes basic procedures for handling animal materials; e.g., vaccinations, supplements															
• Describes safe animal-handling procedures															
• Identifies the components of a safety and biosecurity plan for a specific class of animals															
C. Is familiar with the proper design and use of animal facilities and the equipment for safe and efficient production															
• Identifies common styles of facilities for common poultry and livestock production															
• Identifies safe and effective facility designs based on animal species and environment															
• Describes equipment needed for safe and effective handling of common poultry and livestock; e.g., squeeze chute, twitch, and grooming stand															
D. Is familiar with the effects of environmental conditions on animal production															
• Understands that various environmental conditions affect animal agriculture; e.g., air, water, and temperature															
• Describes the effect of detrimental environmental conditions on common poultry and livestock; e.g., health, production, and reproduction															

	Required Coursework Numbers														
E. Is familiar with the impacts of animal production on the environment															
• Describes environmental conditions affected by animal production															
• Describes the importance of a waste-management and an animal-disposal plan for livestock operations															
F. Is familiar with the issues related to animal rights, animal welfare, and producer responsibilities															
• Differentiates between animal welfare and animal rights															
• Describes the USDA inspection process for livestock processing and handling facilities															
Subarea II. Environmental and Natural Resource Systems (33%)															
Objective 1: Understands the principles of environmental science															
A. Is familiar with natural cycles related to environmental and natural resource management															
• Identifies and explains the carbon cycle, water cycle, and nitrogen cycle as they relate to the environment															
B. Is familiar with chemical properties related to environmental and natural resources															
• Differentiates between organic and inorganic compounds															

	Required Coursework Numbers														
• Describes preemergence and postemergence herbicides															
• Describes selective and nonselective herbicides															
• Describes the effects of chemicals on organisms at different levels of the food chain; e.g., biomagnification															
• Differentiates between point (agricultural) and nonpoint (nonagricultural) source pollution															
C. Is familiar with the various ecosystems of the environment															
• Identifies and describes the various types of ecosystems; e.g., biomes, aquatic versus terrestrial															
• Identifies biotic and abiotic factors that define an ecosystem															
D. Is familiar with the ecological concepts and principles related to natural resource systems															
• Identifies common forestry harvest techniques; e.g., clear-cut, thinning															
• Explains the process of succession in a forest															
• Describes the purpose of reforestation; e.g., soil erosion, water quality, sustainability															
• Explains the difference between preservation and conservation															
• Describes the concepts of population growth and carrying capacity															

	Required Coursework Numbers														
Objective 2: Understands the principles of environmental management and land use															
A. Is familiar with the issues and regulations in forestry, land use, and environmental and natural resource management															
• Identifies the federal agencies responsible for forestry, environmental regulation, and natural resource management; e.g., United States Environmental Protection Agency (EPA), Natural Resources Conservation Service (NRCS), and Bureau of Land Management (BLM)															
• Describes the impact of federal regulations on agriculture production; e.g., Endangered Species Act (ESA) of 1973, water rights															
• Describes the Georgia forestry industry															
B. Knows the use of personal protective equipment (PPE) and safety procedures related to forestry, environmental, and natural resource management															
• Identifies PPE and safety procedures related to forestry, environmental, and natural resource management; e.g., fisheries, wildlife															
C. Is familiar with the role of forestry, environmental, and natural resource management in the local, state, and national economies															
• Describes the importance of hunting, trapping, fishing, and outdoor recreation to the economy															

	Required Coursework Numbers														
• Knows significant legislation milestones related to natural resources; e.g., Clean Air Act, Clean Water Act															
• Explains the contributions of environmental and natural resource management to the national economy															
• Describes the impact of forestry on the economy															
D. Is familiar with the use, production, and processing of forestry and natural resources															
• Identifies products derived from forestry and natural resources; e.g., wood products, fuels, fish, and wildlife															
• Differentiates between renewable and nonrenewable resources															
E. Is familiar with procedures used to develop a forestry, environmental, and natural resource management plan															
• Describes population sampling techniques; e.g., quadrant sampling, electrofishing in aquatic systems, radio tracking															
• Describes the relationship between a species and the habitat needed to support that species															
• Describes a food web															
• Explains the importance of an indicator species															

	Required Coursework Numbers														
F. Knows the general impact of land use on environmental and natural resources															
• Describes methods used to limit erosion and runoff; e.g., buffers, windbreaks															
• Describes best management practices and explains how they benefit the environment; e.g., stocking rate, protection of critical wildlife habitat															
• Describes the effects of urban sprawl on the environment															
G. Describes methods used to limit erosion and runoff; e.g., buffers, windbreaks															
• Explains the role of wetlands in the environment and the need for wetland conservation; e.g., flood control, wildlife habitat															
H. Is familiar with the impact of conventional and alternative energy sources on the environment															
• Identifies environmental impacts of energy production															
• Identifies and explains the use of conventional and alternative energy sources; e.g., fossil fuels, solar, and biomass															

	Required Coursework Numbers														
Subarea III. Plant Systems (33%)															
Objective 1: Understands the principles of plant and soil science as related to the agriculture industry															
A. Is familiar with the historical development of plant science and its relationship with society															
• Knows the development of human use of plants; e.g., food, fiber, shelter															
• Identifies the major milestones and advances of plant science; e.g., plant genetics, soil amendments															
• Understands the importance of plants in the global food supply															
B. Knows general safety issues related to plant systems															
• Identifies and describes safety hazards related to plant production systems; e.g., chemicals, equipment, and tools															
• Defines hazardous plant classifications (e.g., noxious, invasive)															
• Identifies and understands the use of personal protective equipment (PPE)															
• Interprets material safety data sheet (MSDS) information															
• Knows the guidelines for safe pesticide use															
C. Knows the basic principles of identification, classification, anatomy, and physiology as related to plant production and management															
• Understands the taxonomical classification system of plants and the importance of binomial nomenclature															

	Required Coursework Numbers														
• Differentiates between monocots and dicots															
• Describes reproductive and vegetative plant parts and their functions; e.g., roots absorption, stem support															
• Describes major plant processes; e.g., photosynthesis, transpiration, and respiration															
• Identifies and classifies plants according to use and growth habits; e.g., agronomic, horticultural, annual, perennial															
• Differentiates between herbaceous and woody plants															
D. Is familiar with the influence of environmental factors on plant growth															
• Describes how temperature, light, moisture, and air affect plant growth															
• Interprets USDA Plant Hardiness Zone Maps															
E. Knows the basic characteristics and uses of soils, growing media, and nutrients															
• Identifies the macronutrients and micronutrients needed for plant growth															
• Describes the role of nitrogen (N), phosphorus (P), and potassium (K) in plant growth															
• Explains the role soil pH plays in plant production															
• Understands the materials used in soilless media, such as vermiculite, perlite, sphagnum moss, and horticultural-grade sand															

	Required Coursework Numbers														
• Explains soil structure and texture as related to plant growth															
• Describes the types of water in soil; e.g., gravitational, capillary, and available															
• Describes the horizons within a soil profile															
• Understands the basics of soil conservation practices															
F. Is familiar with the propagation, cultivation, and harvesting of plants															
• Describes sexual reproduction in plants; e.g., fertilization, germination, and pollination															
• Describes asexual propagation methods; e.g., cutting, layering, and grafting															
• Identifies major types of cultivation for horticultural crops, including hydroponics															
• Identifies major types of cultivation for agronomic crops															
• Identifies harvesting techniques; e.g., hand, mechanical															
• Describes the importance of growth regulators															
Objective 2: Understands the principles of plant production and management															
A. Is familiar with the use of integrated pest management (IPM) in plant production															
• Describes IPM and its purposes															

	Required Coursework Numbers														
• Differentiates between cultural, biological, mechanical (physical), and chemical controls															
• Describes the types and uses of pesticides; e.g., herbicides, fungicides, and insecticides															
B. Is familiar with production and management practices associated with horticultural crops															
• Identifies proper management and production techniques related to greenhouses, orchards, gardens, and nurseries															
• Describes greenhouse structures and systems															
• Describes the divisions of horticulture; e.g., pomology, floriculture, landscape, and olericulture															
C. Is familiar with production and management practices associated with agronomic crops															
• Identifies equipment used in cultivating and harvesting agronomic crops															
• Identifies and describes the production and management practices of agronomic crops															
• Explains the importance of weed and pest control in agronomic crop production															
• Describes the divisions of agronomic crops; e.g., cereal grains, forage, oil, fiber															
D. Is familiar with the principles and elements of landscape and floral design															
• Identifies and describes the principles and elements of landscape and floral design															