



GACE® Agricultural Education Assessment Test I (040) Curriculum Crosswalk

Required Coursework Numbers

Subarea I. Foundations of Agriculture and Agricultural Education (60%)																				
<i>Objective 1: Understands the agriculture industry and agribusiness systems</i>																				
A. Knows the historical development of agriculture																				
• Describes the spread of agriculture																				
• Describes the value of research in agriculture																				
B. Understands the value of agriculture																				
• Defines agriculture																				
• Identifies the areas or branches of agriculture																				
• Is familiar with global impacts of agriculture																				
• Identifies the major categories of food and fiber products																				
C. Knows the principles of capitalism and entrepreneurship in the agribusiness industry																				
• Describes how supply and demand interact to determine the price of agricultural commodities																				
• Describes the law of diminishing returns																				
• Distinguishes between fixed and variable costs																				
• Distinguishes between marginal cost and marginal return																				

Required Coursework Numbers

<ul style="list-style-type: none"> Distinguishes between inputs and outputs, and makes decisions based on costs and availability 															
<ul style="list-style-type: none"> Distinguishes among current and noncurrent assets and liabilities 															
<ul style="list-style-type: none"> Identifies the opportunity costs within an agribusiness 															
<ul style="list-style-type: none"> Compares and contrasts the main characteristics of individual proprietorships, partnerships, cooperatives, and corporations 															
<ul style="list-style-type: none"> Distinguishes among the sectors of agribusiness; e.g., producer, service, processing, and marketing 															
<ul style="list-style-type: none"> Identifies methods of reducing risk in an agribusiness 															
D. Knows the management skills needed to organize an agribusiness															
<ul style="list-style-type: none"> Identifies and describes key components of a contract and a lease 															
<ul style="list-style-type: none"> Describes diversification and specialization in agribusiness 															
<ul style="list-style-type: none"> Understands basic management skills; e.g., scheduling, hiring, and purchasing 															
<ul style="list-style-type: none"> Describes the components of an agribusiness plan 															
<ul style="list-style-type: none"> Understands steps in the management decision-making process 															

Required Coursework Numbers

E. Knows the record-keeping practices needed to accomplish agribusiness objectives and to make informed decisions															
• Describes the purposes of enterprise records															
• Develops and completes an enterprise budget															
• Develops a balance sheet and analyzes its uses															
• Completes and interprets a cash-flow statement															
• Identifies the components of a completed inventory															
• Describes depreciation															
• Develops an income/expense statement and describes its purposes															
• Completes a break-even analysis for an enterprise															
• Analyzes the important financial ratios and calculations; e.g., net worth, debt to equity, solvency															
F. Is familiar with the fundamentals of savings, investments, and credit in agribusiness															
• Identifies the importance of a savings and investment plan															
• Identifies the sources of credit															
• Describes ways to build and maintain credit															
• Describes a business proposal															

Required Coursework Numbers

G. Is familiar with the marketing principles needed to accomplish agribusiness objectives																		
<ul style="list-style-type: none"> Describes the components and purpose of a promotional campaign 																		
<ul style="list-style-type: none"> Describes key factors involved in marketing; e.g., product knowledge, service knowledge, and customer knowledge 																		
<ul style="list-style-type: none"> Describes how market prices and cycles affect agricultural commodities 																		
<ul style="list-style-type: none"> Describes commodity futures and options trading 																		
<ul style="list-style-type: none"> Distinguishes between hedging and speculation 																		
<i>Objective 2: Understands leadership, career, and program development in agriculture and agricultural education</i>																		
A. Knows the principles of individual and team leadership																		
<ul style="list-style-type: none"> Describes the importance of personal leadership development; e.g., personality, leadership style, and Maslow's hierarchy 																		
<ul style="list-style-type: none"> Describes various forms of leadership; e.g., democratic, authoritarian, and situational 																		
<ul style="list-style-type: none"> Understands basic parliamentary procedure motions described in the <i>Official FFA Manual</i> 																		
<ul style="list-style-type: none"> Describes proper presentation and disposal of a main motion 																		

Required Coursework Numbers

<ul style="list-style-type: none"> Describes the purpose of parliamentary procedure in Future Farmers of America (FFA) meetings 																
<ul style="list-style-type: none"> Describes team-building skills; e.g., motivation, communication, and influence 																
<ul style="list-style-type: none"> Differentiates between the positive and negative attributes of a leader 																
<ul style="list-style-type: none"> Identifies the importance of ethics in leadership 																
B. Knows the foundational areas of career development																
<ul style="list-style-type: none"> Describes how to develop a career plan; e.g., strengths, values, and interests 																
<ul style="list-style-type: none"> Develops a career plan to meet career goals; e.g., education, employment, and lifestyle goals 																
<ul style="list-style-type: none"> Describes the various components related to job preparation; e.g., résumé development, interviewing, and overall business etiquette 																
C. Understands the purpose, structure, and function of the National FFA Organization																
<ul style="list-style-type: none"> Identifies the FFA mission statement, creed, motto, ceremonies, and salute 																
<ul style="list-style-type: none"> Identifies different types of FFA membership 																
<ul style="list-style-type: none"> Describes major historical moments and figures of the FFA; e.g., founded in 1928, New Farmers of America, E. M. Tiffany, girls allowed in 1969, Henry C. Groseclose 																

Required Coursework Numbers

<ul style="list-style-type: none"> Identifies the constitutional officer positions and their duties 																
<ul style="list-style-type: none"> Knows the FAA degrees 																
<ul style="list-style-type: none"> Understands the importance of the Program of Activities and FFA Committee structures 																
<ul style="list-style-type: none"> Identifies and describes career development events (CDEs) and their purpose 																
<ul style="list-style-type: none"> Identifies FFA award programs; e.g., degree programs and applications, proficiencies, leadership awards, scholarships 																
D. Knows communication skills																
<ul style="list-style-type: none"> Describes effective communication skills; e.g., written, verbal, and nonverbal 																
<ul style="list-style-type: none"> Identifies techniques to improve listening, reading, writing, speaking, and nonverbal communication skills 																
E. Knows information research skills to make informed decisions																
<ul style="list-style-type: none"> Describes how to determine validity and reliability of a source; e.g., author, date, bibliography, type of source 																
<ul style="list-style-type: none"> Understands the scientific method 																
F. Understands supervised agricultural experiences (SAEs)																
<ul style="list-style-type: none"> Describes the purpose of an SAE 																
<ul style="list-style-type: none"> Describes the major types of SAEs; e.g., entrepreneurship, placement, agriscience, agribusiness, exploratory 																

Required Coursework Numbers

<ul style="list-style-type: none"> • Describes how to develop an SAE program 															
<ul style="list-style-type: none"> • Identifies student advancement and awards related to the SAE program; e.g., degrees, proficiency awards 															
<ul style="list-style-type: none"> • Applies basic financial record-keeping skills for the establishment and maintenance of an SAE 															
G. Knows opportunities across the various career pathways of agriculture															
<ul style="list-style-type: none"> • Describes the various career pathways within the Agriculture, Food, and Natural Resources Career Cluster 															
<ul style="list-style-type: none"> • Identifies the specific skills and education needed for the career pathways 															
<ul style="list-style-type: none"> • Describes agricultural careers available to students in an agricultural education program 															
H. Is familiar with local program planning and management															
<ul style="list-style-type: none"> • Identifies and describes the three components of a comprehensive agricultural education program 															
<ul style="list-style-type: none"> • Defines the scope and sequence for a secondary agricultural education program, including the FFA Alumni Association, Georgia Young Farmers Association, and adult agricultural education programs 															
<ul style="list-style-type: none"> • Identifies the purpose and importance of an advisory committee 															

Required Coursework Numbers

Subarea II. Food Science and Biotechnology (20%)																		
<i>Objective 1: Understands trends, regulatory agencies, and processes related to food science</i>																		
A. Is familiar with major issues and trends affecting the food products and processing industry																		
<ul style="list-style-type: none"> Identifies major trends and developments in the food products and processing industry; e.g., buying local, free-range animals, and irradiated beef 																		
<ul style="list-style-type: none"> Describes dietary trends affecting the food industry; e.g., low fat, sugar free, gluten free 																		
B. Is familiar with regulatory agencies that effect the food products and processing industry																		
<ul style="list-style-type: none"> Describes how the United States Department of Agriculture (USDA) and the United States Food and Drug Administration (FDA) regulate the food products and processing industry; e.g., country-of-origin labeling, nutrition labeling, and inspections 																		
C. Is familiar with selecting, harvesting, processing, and classifying food products for storage, distribution, and consumption																		
<ul style="list-style-type: none"> Describes the purpose of grading to select food products for a specific use 																		
<ul style="list-style-type: none"> Describes the methods that add value to agricultural commodities 																		
<ul style="list-style-type: none"> Identifies basic processing techniques; e.g., preservation, homogenization, and meat fabrication 																		

Required Coursework Numbers

<ul style="list-style-type: none"> Describes the importance of controlled features in the processing of food; e.g., temperature, moisture, and sanitation 																		
<i>Objective 2: Understands biotechnology as it relates to the agriculture industry</i>																		
A. Is familiar with major innovations, historical developments, and applications of biotechnology in agriculture																		
<ul style="list-style-type: none"> Identifies the major biotechnological innovations; e.g., increased yields, herbicide tolerance, and insect resistance 																		
<ul style="list-style-type: none"> Describes the advantages that advances in biotechnology offer local producers 																		
B. Is familiar with the ethical, legal, social, cultural, safety, and environmental issues related to biotechnology																		
<ul style="list-style-type: none"> Identifies the major legal and ethical issues surrounding the adoption of biotechnology 																		
<ul style="list-style-type: none"> Identifies the social and cultural issues related to agricultural biotechnology; e.g., resistance to the use of genetically modified organisms (GMOs), hormones 																		
<ul style="list-style-type: none"> Identifies the economic impact of biotechnology 																		
<ul style="list-style-type: none"> Describes the environmental issues related to agricultural biotechnology; e.g., herbicide resistance in weeds, beneficial-insect decline 																		
C. Is familiar with basic, safe laboratory procedures																		
<ul style="list-style-type: none"> Identifies the principles of aseptic technique 																		

Required Coursework Numbers

<ul style="list-style-type: none"> Identifies potential hazards in a biotechnology lab 																		
<ul style="list-style-type: none"> Identifies the safety equipment needed to properly conduct a laboratory experiment 																		
<ul style="list-style-type: none"> Describes safe handling of laboratory materials, chemicals, and equipment 																		
D. Is familiar with the various uses of genetic engineering in the agricultural industry																		
<ul style="list-style-type: none"> Identifies the uses of genetic engineering, cloning, and stem-cell research in agriculture 																		
<ul style="list-style-type: none"> Identifies the purpose of genetically modifying organisms in agriculture 																		
Subarea III. Power, Structural, and Technical Systems (20%)																		
<i>Objective 1: Understands science principles and safety of power, structural, and technical systems</i>																		
A. Is familiar with the physical science principles and engineering applications associated with power, structural, and technical systems																		
<ul style="list-style-type: none"> Describes the basic principles of work and power; e.g., pneumatics, hydraulics, and simple machines 																		
<ul style="list-style-type: none"> Differentiates among basic metals as they pertain to a welding shop; e.g., mild steel, cast iron, brass, and copper 																		
<ul style="list-style-type: none"> Describes horsepower for engines, equipment, and electrical motors 																		

Required Coursework Numbers

<ul style="list-style-type: none"> Differentiates among conduction, convection, and radiation 																		
<ul style="list-style-type: none"> Describes principles of oil viscosity and lubrication 																		
B. Is familiar with various power and energy sources																		
<ul style="list-style-type: none"> Describes proper safety procedures for dealing with power and energy sources 																		
<ul style="list-style-type: none"> Compares and contrasts the benefits and costs of various energy sources; e.g., wind, solar, hydro, coal, and nuclear 																		
<ul style="list-style-type: none"> Differentiates among energy sources; e.g., internal combustion, mechanical, and electrical 																		
C. Is familiar with the principles of power, energy transfer, and conversion																		
<ul style="list-style-type: none"> Describes the basic operating principles of an electric motor 																		
<ul style="list-style-type: none"> Describes the basic principles of gears and pulleys 																		
<ul style="list-style-type: none"> Describes gear reduction and multipliers 																		
<ul style="list-style-type: none"> Describes the transfer of power/energy from a motor to an implement 																		
D. Knows the proper use, storage, and disposal of potentially hazardous materials																		
<ul style="list-style-type: none"> Describes the importance of proper laboratory safety 																		
<ul style="list-style-type: none"> Interprets instructions and precautions 																		

Required Coursework Numbers

<ul style="list-style-type: none"> Identifies Occupational Safety and Health Administration (OSHA) regulations regarding laboratory safety colors and uses 																			
<ul style="list-style-type: none"> Explains the proper storage of compressed-gas bottles according to OSHA regulations 																			
<ul style="list-style-type: none"> Describes the proper storage and disposal of hazardous materials; e.g., fuels, pesticides, and paints 																			
E. Is familiar with the application of technology to the agriculture industry																			
<ul style="list-style-type: none"> Defines the term "GIS (Geographic Information System)" and explains its relationship to GPS (Global Positioning System) 																			
<ul style="list-style-type: none"> Explains how GPS and GIS are used in precision agriculture 																			
<ul style="list-style-type: none"> Lists the common applications of GPS technology in agriculture 																			
<ul style="list-style-type: none"> Identifies potential applications for computer-controlled technology; e.g., greenhouse controls (GNC), computer numerical control machines, and automated equipment 																			
<i>Objective 2: Understands applications of power, structural, and technical systems</i>																			
A. Is familiar with electricity and electrical wiring																			
<ul style="list-style-type: none"> Identifies proper safety procedures for working with electricity and electrical wiring 																			
<ul style="list-style-type: none"> Defines common electrical terms; e.g., amp, volt, ohm, watt, kilowatt, kilowatt hour, conductor, resistance, and transformer 																			

Required Coursework Numbers

<ul style="list-style-type: none"> Determines amperage, voltage, horsepower, wattage, and rpm from the nameplate on an electric motor 															
<ul style="list-style-type: none"> Identifies the importance of grounding and ground fault circuit interrupters (GFCIs) 															
<ul style="list-style-type: none"> Calculates electrical power usage and cost using Ohm's law 															
<ul style="list-style-type: none"> Interprets electrical diagrams of common 110–120 volt AC electrical circuits; e.g., single-pole switches, three-way switches, outlets, GFCI, and fixtures 															
<ul style="list-style-type: none"> Distinguishes the differences between AC and DC circuits 															
<ul style="list-style-type: none"> Identifies conductors and insulators 															
B. Knows the safe operation and maintenance of hand tools, power tools, and other equipment															
<ul style="list-style-type: none"> Identifies potential safety hazards in the agriculture mechanics laboratory 															
<ul style="list-style-type: none"> Identifies hand tools and determines their uses 															
<ul style="list-style-type: none"> Identifies power tools and determines their uses 															
<ul style="list-style-type: none"> Identifies the proper use of electrical wiring tools and supplies 															
<ul style="list-style-type: none"> Describes the basic use and maintenance of common pneumatic shop equipment; e.g., air compressor, impact wrench 															
<ul style="list-style-type: none"> Describes hand-tool and power-tool maintenance 															

Required Coursework Numbers

C. Is familiar with the principles of small-engine operation, maintenance, and repair																		
<ul style="list-style-type: none"> Identifies basic maintenance procedures and adjustments of internal combustion engines 																		
<ul style="list-style-type: none"> Identifies the basic parts of a small gas engine 																		
<ul style="list-style-type: none"> Describes the four-stroke cycle and the two-stroke cycle 																		
<ul style="list-style-type: none"> Describes the principles of spark-ignition engine (gas) operation 																		
<ul style="list-style-type: none"> Describes the basic principles of compression engine (diesel) operation 																		
<ul style="list-style-type: none"> Identifies the different fuels used in internal combustion engines 																		
<ul style="list-style-type: none"> Describes engine displacement 																		
D. Is familiar with metal fabrication and welding																		
<ul style="list-style-type: none"> Describes and identifies metal shop safety procedures and equipment 																		
<ul style="list-style-type: none"> Describes different types of welding; e.g., shielded metal-arc welding (SMAW), gas metal-arc welding (GMAW), flux-cored arc welding (FCAW), tungsten-inert gas (TIG), oxy-fuel, and brazing 																		
<ul style="list-style-type: none"> Identifies common welding joints, including lap, butt, and fillet 																		
<ul style="list-style-type: none"> Describes basic arc welding procedures and terminology; e.g., positions, classifying rods, and polarity 																		

Required Coursework Numbers

<ul style="list-style-type: none"> Describes proper metal-cutting practices; e.g., oxy-fuel, plasma, cutoff saws, and shears 															
<ul style="list-style-type: none"> Describes basic oxy-fuel welding procedures and terminology; e.g., positions, equipment setup, and selection 															
<ul style="list-style-type: none"> Describes the fundamentals of cold metal work 															