

**CNAS ASSESSMENT COMMITTEE
 AGRICULTURE (AG) DEGREE PROGRAM
 CURRICULAR MAPPINGS AND COURSE EXPECTED STUDENT LEARNING OUTCOMES (SLOs)**

I. CURRICULAR MAPPINGS

A. DEGREE PROGRAM CURRICULAR MAPPING

AGRICULTURE PROGRAM LEARNING OBJECTIVES	COURSE NO. (Required or recommended for major)	LINK TO PROGRAM OBJECTIVES (The numbers are course SLO numbers that link the course to the program SLO – See Section II for the defined course SLO numbers)							
		AG PR-1	AG PR-2	AG PR-3	AG PR-4	AG PR-5	AG PR-6	AG PR-7	
		<p>AG PROG-1: TECHNICAL KNOWLEDGE. Graduates will gain the theoretical and practical scientific knowledge needed for continued effective and sustainable crop production, as well as the information and subject-matter mastery required for exercising wise judgment in dealing with complex issues in resource management and conservation. And, it must be instilled that education is a life-long pursuit.</p> <p>AG PROG-2: PROFESSIONAL AND COMMUNICATION SKILLS. Students will develop the human and technical skills needed to function in the forefront of an increasingly complex and competitive society: oral and written communication, and leadership skills, and the critical, integrative thinking capacity supports competent problem solving and decision making.</p> <p>AG PROG-3: TECHNOLOGICAL LITERACY: Graduates are competent at applying technological skills to their chosen work. They are also competent in the use of analog and digital equipment used in modern agricultural systems. Graduates effectively judge the usefulness and appropriateness of existing and new technologies in their professional endeavors.</p> <p>AG PROG-4: PERSPECTIVE. The graduate should have a holistic perspective of agriculture; an appreciation of agriculture as a highly sophisticated, integrated system that operates within a political environment and on a global scale. He/she must be able to visualize what makes the whole work, and understand the responsibilities of the agronomist within the system with respect to production of an abundant, safe, and nutritious food supply within the context of wise management of natural resources.</p> <p>AG PROG-5: ETHICS/VALUES. The curriculum should lead students in development of an appreciation of ethical resource management responsibilities in regional, national and world social and economic contexts. It must instill awareness for sustainable management of energy, soil, water, wildlife and other natural resources.</p> <p>AG PROG-6: DIVERSITY. For society to function effectively and justly for each person, graduates must appreciate the richness that our diverse backgrounds and philosophies bring to the whole. Understanding of and appreciation for the political, cultural, and religious opinions and practices of others is the hallmark of an educated person.</p> <p>AG PROG-7: ANALYTIC SKILLS. Graduates are competent at collecting, organizing, analyzing, interpreting and presenting quantitative and qualitative data in agricultural science and natural resources.</p>	AG101	1,2,	4	2,3	3	4	1
AG102	1-10				2				3
AG109	1,2,3,4,5		1,2,3,4	4					1,2,3,4,5
AG136/AG136L	1,2,3,4,5,6				1,3	6			4,5,6
AG211	1,2,3,4		4	2,3,4	3	3			4
AG281	1,2,3,4,5		1,2,3,4,5	3,4,5	3,4,5	3,4,5	4		1,2,3,4,5
AG321 ¹									
AG323			1,2,3	3		1			2,3
AG340	1,2,3,4		4	3	4	3	3		1,2,3,4
AG342	1,2,3,4,5		2,4	1,4	2,3	3			1,3,4,5
AG/BI345	1,2,3,5		4	1,2,3,5	2,4	4			1,2,4
AG/NS380	4				1,2,3,6	5			6
AG/CF389 ²									
AG392	1,2		3,4	1,2	1,2	3			2
AG/PA401 ¹									
AG423			1,2,3	1,2		1			2,3
AG/BI430			1,6,8	1,2,3,4,5,7,9		8			7,8,9
AG451 ¹									
AG480	1				123	3			
AG481	4				1236	5			5
AG484	1,2,3,4	1,2,4	4	4	3,4			4	
AG485	1,2,3		1,2	1,2,3		1		1,2,3	
AG486 ¹									

¹Pending Faculty Input; ²See CF389 in Consumer and Family Sciences SLOs-CMs;

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B. AGRICULTURE GE CURRICULAR MAPPING

DEFINED GE SCIENCE SLOs	COURSE NO.	LINK TO GE SLOs (The numbers are course SLO numbers that link the course to the program SLO – See Section II for the defined course SLO numbers)						
		SC GE-1	SC GE-2	SC GE-3	SC GE-4	SC GE-5	SC GE-6	SC GE-7
<ul style="list-style-type: none"> • SC GE-1: observe, describe, and interpret natural and experimental phenomena within the context of a scientific paradigm; • SC GE-2: develop and employ skills of logical and critical thinking to collect and analyze data, interpret results, and write reports; • SC GE-3: characterize scientific knowledge as theories and principles that result from experimentation that are subject to revision based on new observations and discoveries; • SC GE-4: apply basic scientific principles and methods to explore the workings of the natural world, particularly in this region; • SC GE-5: apply basic scientific principles and methods to solve real-world problems, and make appropriate use of science in their choices as citizens. • SC GE-6: identify the capabilities and limitations of science, and distinguish science from pseudoscience; • SC GE-7: identify how scientific ideas and values have been integrated into society and how other aspects of society affect science as a human activity. 	AG101	2,3	2,3	1	4	2,3	1	1
	AG102	1,5	3	3		1,3,10	10	2
	AG109	1,2,3,4,5	4	1,2,3,4	1,2,3,4,5	2,3,4	4	1,2,3
	AG136/AG136L	2,3,4,5	4	3	5	5,6		

Pending Faculty Input

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II. AGRICULTURE APPROVED COURSE EXPECTED SLOs

COURSE NO.	COURSE SLOs
AG 101: Introduction to Agriculture	<ol style="list-style-type: none"> 1. Students will be able to articulate the influence of early cultures and geography on agriculture production at the local, national, and international level. 2. Students will be able to identify the 20 fields of study and their basic technologies that are behind the production of food and fiber. 3. Students will be able to identify 10 common agricultural practices that pose risks to the environment and to society at large. 4. Students will conduct and report on a semester long laboratory project that requires the student to collect, organize, analyze, and interpret data.
AG 102: Plant Biology	<ol style="list-style-type: none"> 1. Describe how and why all life is dependent on green organisms. 2. Explain how humans have impacted their environment. 3. Explain briefly what the scientific method is. 4. Explain the nature of compounds, acids, bases and salts. 5. Identify and describe the structure and function of plant cells, organelles, tissues and organs. 6. Describe the functions of root, stems, leaves flowers, fruits and seeds. 7. Describe the differences between photosynthesis and respiration. 8. Diagram and describe the phases of meiosis and mitosis. 9. Describe the structure and functions of DNA. 10. Distinguish between phenotype and genotype.
AG 109: The Insect World	<ol style="list-style-type: none"> 1. Students will be able to identify the importance of insects' role in the world to the functioning of the terrestrial ecosystems. 2. Students will be able to explain how insects deal with the world around them. 3. Students will be able to use insects as examples to apply concepts and comparisons with other organisms. 4. Students will explore experimental techniques, learn technical writing skills, will be given hands on experience to ideas or material presented in lecture, and develop critical thinking. 5. Students will be able to identify insects to the level order.

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AG 136/AG136L: Science of Aquaculture	<ol style="list-style-type: none"> 1. Demonstrate an understanding of history, impact, current status and future trend of aquaculture. 2. Demonstrate an understanding of anatomy and physiology of fish. 3. Develop working knowledge of major components in aquaculture development. 4. Establish hand-on experience in aquaculture practices: water quality monitor and sampling, as well as data collection and interpretation in aquaculture system. 5. Identify the species and describe the systems commonly used in Guam Aquaculture. 6. Identify disease and environmental/water quality constraints to productions.
AG 211: Principles of Animal Science	<ol style="list-style-type: none"> 1. Student will describe major commercial breeds of livestock and poultry. 2. Student will demonstrate animal husbandry skills. 3. Student will demonstrate an integrated view of farm animals (animal contribution, distribution, ecological and economic importance). 4. Student will describe general scientific concepts and methodology.
AG 281: Principles of Horticulture Science	<ol style="list-style-type: none"> 1. Student will describe botanical and horticultural classification of plants. 2. Student will demonstrate horticultural skills of plant propagation. 3. Student will demonstrate horticultural skills of general garden plant care including pruning, irrigation, and fertilizer application and plant diagnostics. 4. Student will describe scientific names, origin, economic/cultural uses, plant improvement methods, and post-harvest handling of at least three important plants in horticulture. 5. Student will describe how horticulturists can modify environmental factors affecting plant growth in order to produce superior agricultural crops.
AG 321: Horticulture Plant ID	<p>Students will be able to:</p> <ol style="list-style-type: none"> 1. Identify up to 150 different species of plants used or that are important to Guam's culture, economy and environment. 2. Differentiate among different leaf, floral and fruiting structures used to identify trees, shrubs, and herbaceous plants. 3. Select appropriate fruits, vegetables, and ornamental plants for use in Guam. 4. Apply the binomial nomenclature system to name plants found in the landscape. 5. Apply the basics of plant classification to fruits, vegetables, weeds and ornamental plants found in Guam. 6. Construct a plant specimen reference collection using pressed plant specimens and/or photographs collected by the student.

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AG 323: Plant Pathology	<p>(SLOs submitted by AG faculty, but still need CNAS-AAC approval):</p> <p>Students completing this course will be able to:</p> <ol style="list-style-type: none"> 1. Explain the principles underlying the nature of plant diseases that are related to tropical crop production and horticulture. 2. Explain the symptoms, causal agents and control strategies regarding tropical plant diseases. 3. Explain the techniques involved in the study and management of tropical plant diseases.
AG 340: Pest Management	<ol style="list-style-type: none"> 1. Students will be able to label a total of 50 anatomical parts of insects, weeds, and fungi. 2. Students will be able to draw and label life cycles of three insects, four weed's, and one each of the following plant diseases: imperfect fungi, bacteria, and viruses. 3. Students will be able to develop control strategies for 20 of Guam's most common pests incorporating cultural, physical and chemical methods. 4. Student will be expected to pass the University of Guam Private Pesticide Applicators course and the Nation Plant Diagnostic Network (NPDN) First Detector Course.
AG 342: Principles of Agricultural Engineering	<p>Students will be able to:</p> <ol style="list-style-type: none"> 1. Carry out three types of leveling surveys - differential leveling, profile leveling, and topographic leveling. 2. List and describe various irrigation methods, microirrigation system parts, operation, and maintenance of drip irrigation systems. 3. Calculate irrigation water requirement and irrigation schedules of agricultural crops. 4. Demonstrate knowledge of the principles of operation of internal Combustion engines, work, energy, power, power trains and speed reduction gears. 5. Calculate heat load and ventilation requirements for animal structures and housing
AG/BI 345: General Entomology	<ol style="list-style-type: none"> 1. The student will be able to identify insects on Guam to the family level. 2. The student will be able to describe the basic biology and ecology of the insect orders, and of the most important families within those orders. 3. The student will be able to identify and describe the function of external the internal anatomical features of the various insect orders. 4. The student will be able to write a research paper on an entomological topic using college level English and following formats acceptable for current professional scientific journals. 5. The student will be able to prepare an insect collection using acceptable museum-

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	acceptable preservation and mounting procedures.
AG/NS 380: Principles of Soil Science	<ol style="list-style-type: none"> 1. Interpret Soil formation factors, Soil classification system, Soil morphology and different Soil behavior. 2. Explain how soil's chemical, biological, and physical properties affect soil quality as a medium for plant growth. 3. Explain how soil's chemical, biological, and physical properties interact to affect soil nutrient utilization by plant as influenced by different soil properties. 4. Determine soil's chemical, biological, and physical properties by conducting laboratory exercises. 5. Learn how to follow the safety procedures while conducting laboratory exercises. 6. Learn the basic analytical skills and calculations
AG/CF 389: Extension Programs and Planning	SEE CF389 in Consumer and Family Sciences SLOs-CMs
AG 392: Laboratory Teaching Assistantship	<p>(SLOs submitted by AG faculty, but still need CNAS-AAC approval):</p> <ol style="list-style-type: none"> 1. Student will demonstrate to prepare a proper set-up for each agricultural laboratory. 2. Student will be able to describe a scientific concept of agricultural lab activity. 3. Student will be able to provide a proper guidance to participants of the agricultural lab. 4. Student will demonstrate a communication skill with the instructor of the agricultural lab.
AG/PA 401: Community Planning	PENDING FACULTY INPUT
AG 423: Advanced Plant Pathology	<p>(SLOs submitted by AG faculty, but still need CNAS-AAC approval):</p> <p>Students completing this course will be able to:</p> <ol style="list-style-type: none"> 1. Explain the principles introduced in AG323, which will be expanded. 2. Explain the principles underlying epidemiology of tropical plant diseases. 3. Explain the principles of the physiology of parasitism and disease modeling.
AG/BI 430: Scientific Digital Photography	<p>Students will be able to:</p> <ol style="list-style-type: none"> 1. Make an exposure appropriate to the visual concept desired to communicate. 2. Make an exposure with a digital camera and download it to a workstation and make a print and or screen image. 3. Merge and process digital images. 4. Given a choice of lenses, the student will be able to select an appropriate focal length to

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	<p>communicate their ideas.</p> <ol style="list-style-type: none"> 5. Student will be able to choose the appropriate shutter speed, aperture and ISO to communicate desired idea. 6. Given a photograph, the student will be able to articulate criticism regarding the image and evaluate its quality. 7. Use digital techniques to enhance images to optimize desired image information. 8. Retouch an image to enhance specific objects in the image using the ethical considerations of publishing images in scientific literature. 9. Insert reference lines into images to indicate proper scale.
AG 451: Agricultural Business Management	PENDING FACULTY INPUT
AG 480: Tropical Soil Management and Fertility	<ol style="list-style-type: none"> 1. Interpret how soil chemical, biological, and physical factors interact to affect the soil as a medium for plant growth. 2. Explain the role of plant nutrients in plant growth and the processes affecting nutrient utilization under tropical conditions. 3. Identify nutrient management practices, including the use of soil amendments that maximize plant productivity and profitability while conserving or enhancing environmental quality under tropical conditions.
AG 481: Environmental Soil Science	<ol style="list-style-type: none"> 1. List environmental assessment and soil contaminants measuring techniques and analysis. 2. Define the processes and impacts of soil erosion (water, wind). 3. Explain the soil conservation techniques for controlling soil erosion 4. Explain how to manage to soil fertility and productivity while maintaining the environmental integrity. 5. Identify the techniques that are used for bioremediation of contaminated soils 6. Explain how soil can be managed to filter out contaminants before they reach the groundwater.
AG 484: Tropical Vegetable Production	<ol style="list-style-type: none"> 1. Student will describe classification of vegetable crops. 2. Student will describe growth habit and adaptation of vegetable crops 3. Student will identify important vegetable crops produced in Guam, in US and in the world. 4. Student will demonstrate growing vegetables using general crop production skills including land preparation, planting, irrigation, fertilizer application, pest control, harvest, and post harvest handling.
AG 485: Tropical Fruits Horticulture	(SLOs submitted by AG faculty, but still need CNAS-AAC approval):

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	<ol style="list-style-type: none"> 1. Develop a working knowledge of tree, flowering, and fruiting characteristics of all tropical fruit crops. 2. Demonstrate an understanding of cultural methods for production of the major fruits on Guam. 3. Identify and correctly name all of the common fruit-bearing species on Guam.
<p>AG 486: Ornamental Crop Production in the Tropics</p>	<p>Students will be able to:</p> <ol style="list-style-type: none"> 1. Identify and describe common ornamental plants. 2. Develop a crop production schedule for a nursery operation 3. Describe the appropriate pretreatments for plant propagation 4. Describe and explain a mist propagation system