










University of the Philippines
LOS BAÑOS

College of Agriculture and Food Science

COLLEGE OF AGRICULTURE AND FOOD SCIENCE

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The College of Agriculture and Food Science (CAFS), formerly known as UPCA and then the College of Agriculture, was founded in 1909 and is the oldest college in UPLB. In 2016, it underwent restructuring to align the units to their respective relevant agribusiness sub-sectors in the field of agriculture. CAFS rose to become the country's premier agricultural college, leading the country's agricultural education, research, extension and public service, and technology development and transfer. As a testament to this, the College received the prestigious Ramon Magsaysay Award for International Understanding in 1977. Since January 11, 2000 to date, its BS Agriculture program is the Center of Excellence in Agriculture Education by the Commission on Higher Education (CHED). Moreover, the College has been given accreditation as Continuing Professional Development (CPD) provider by the Professional Regulation Commission in March 2022.

The College has five academic units, namely: Agricultural Systems Institute; Institute of Animal Science; Institute of Food Science and Technology; Institute of Crop Science; and Institute of Weed Science, Entomology and Plant Pathology. Also, it has four research units, namely: Dairy Training and Research Institute; Institute of Plant Breeding; National Crop Protection Center; and Postharvest Training and Research Center. The College also manages the Central Experiment Station, and the La Granja Research and Training Station.

VISION

A premier institution of higher learning in agriculture and food sciences promoting the development of a robust agriculture sector and industry that meets the challenges of food security and safety, poverty, climate change and environmental sustainability.

MISSION

As the premier institution in agriculture and food sciences, the College of Agriculture and Food Science is committed to the development and implementation of relevant programs in education, research, extension, policy-making/advocacy and nation-building

GOALS

- Offering dynamic and relevant undergraduate and post-graduate curricular programs that promote science-based, relevant and sustainable agriculture and food sciences;
- Generation of scientific ideas, concepts, technologies, products and processes in agriculture and food sciences that are relevant to Philippine agriculture and industry in particular and global agriculture in general;
- Effective promotion of the utilization of scientific knowledge for the betterment of local farming communities, and enhancement of the competitiveness of the country's products, services and agribusiness industries;
- Contribution to the shaping of national policies and priorities in agriculture and food industry; and
- Establishment of partnerships and strategic alliances to promote the development of the agriculture and food sector industry.

DEGREE PROGRAMS OFFERED

The College of Agriculture and Food Science offers the following degree programs: Bachelor of Science in Agriculture (BSA); Bachelor of Science in Agricultural Biotechnology (BSABT); and Bachelor of Science in Food Science and Technology (BSFST). The program leading to the degree of Bachelor of Science in Agricultural Chemistry (BSAC) is jointly offered with the College of Arts and Sciences. The BSA, BSABT, and BSFST programs are four-year programs, while BSAC is a five-year program.

Bachelor of Science in Agriculture

This program aims to educate students towards a career in scientifically based sustainable agriculture, to enable them to develop and effectively manage a self-reliant and economically viable agriculture-related enterprise, and to prepare them to become professionals with social commitment. Students may opt for a combination of thesis and practicum or major practice and special problem. The practicum and major practice options are farm/plant practice, research internship, agricultural entrepreneurship, teaching, and extension/community internship. This career can be pursued in any of the following major areas and fields of specialization.

1. *Agricultural Extension*

2. *Agricultural Systems*

3. *Agronomy*	Crop Production and Management Plant Breeding Seed Science and Technology
4. Animal Science	Animal Breeding Animal Nutrition Animal Physiology Animal Production Meat Science Dairy Technology
5. Entomology	IPM/Economic Entomology Biological Control Insecticide Toxicology Host Plant Resistance to Insects

	Insect Molecular Biology
	Insect Physiology and Biochemistry
	Insect Pathology and Microbiology
	Medical and Veterinary Entomology
	Insect Transmission of Plant Pathogen
	Acarology
	Pesticide Chemistry
	Insect Taxonomy/Systematics
6. Horticulture	Crop Breeding
	Crop Production and Management
	Crop Physiology
	Landscaping
	Postharvest Science
7. Landscape Agroforestry	
8. Plant Pathology	Biological Control
	Disease Management
	Epidemiology and Disease Modeling
	Fungal Physiology and Genetics
	Genetics of Host-Pathogen Interaction
	Phytobacteriology
	Postharvest Pathology
	Mycology
	Molecular Plant Pathology
	Phytonematology
	Plant Virology
9. Soil Science	Land Use
	Soil Microbiology
	Soil Physics
	Soil Chemistry
	Soil Fertility/Plant Nutrition
	Soil Conservation and Management
	Soil Morphology, Genesis and Classification (Pedology)
10. *Weed Science*	Biological Control
	Genetics and Resistance
	Herbicide
	Physiology
	Weed Biology
	Weed Ecology and Evolution

Bachelor of Science in Agricultural Biotechnology

This program aims to produce graduates who: shall have acquired knowledge and developed skills in the application of biotechnology, genetic control, and environmental manipulation technologies to improve agricultural production and maintain quality agro- environments; shall have been trained in the new emerging scientific concepts; shall be able to discuss issues and concerns related to biotechnology and form science-based decisions; shall have been trained in technology innovation and bio-entrepreneurship; and shall be able to work independently, as well as be productive members of interdisciplinary teams. The students are required to take either undergraduate thesis and practicum, or major practice and special problem for them to develop their skills in research and gain hands-on experience in agricultural biotechnology in a specific workplace setting like research laboratory, processing plant, diagnostic lab etc. The program initially has four majors: Crop Biotechnology; Animal Biotechnology; Food Biotechnology; and Crop Protection Biotechnology.

Bachelor of Science in Food Science and Technology

This program is designed to address the demand of the food industry and academic research institutions for highly trained manpower in this field. This technology-based curriculum is relevant and responsive to the needs of the modern times and society towards sustained economic development. This will provide students technical and entrepreneurial knowledge and skills to face the continuing challenges in the food industry. This program aims produce graduates who exhibit sufficient level of technical competency, with social commitment, in science-based processing of agricultural products; demonstrate holistic understanding of various disciplines of food science and technology namely food chemistry, food microbiology, and food engineering; apply the sciences and related fields of study in preparation, processing, packaging, storage, and distribution of food to ensure food security and the well-being of individuals, families and communities; effectively use the scientific method in promoting the sustainability of food processing systems; develop and effectively manage a self-reliant, economically viable, ecologically sound, and culturally appropriate food-related enterprise; effectively communicate the issues concerning food science and technology to the various sectors of society; maintain values and global ethical perspective in the practice of their profession; and work independently and/or in multi-disciplinary, multi-cultural teams of related fields, with minimal supervision.

BACHELOR OF SCIENCE IN AGRICULTURE

First Semester	***Units***	***Second Semester***	***Units***
		FIRST YEAR	
AGRI 11, Introduction to Agriculture	1	AGRI 41, Principles of Crop Protection	3
AGRI 21, Introduction to Animal Science	3	AGRI 51, Principles of Soil Science	3
AGRI 31, Fundamentals of Crop Science I	3	AGRI 22, Introduction to Livestock and Poultry Production	3
CHEM 18, University Chemistry	3	AGRI 32, Fundamentals of Crop Science II	3
CHEM 18.1 University Chemistry (Laboratory)	2	KAS 1/HIIST 1, Kasaysayan ng Pilipinas/ Philippine History	3
ARTS 1, Critical Perspectives in the Arts	3	ETHICS 1, Ethics and Moral Reasoning in Everyday Life	3
STS 1, Science, Technology and Society	3	HK 12 or 13, Collegiate or Advanced Collegiate Human Kinetics Activities	(2)
HK 11, Wellness and Basic Injury Management	(2)		
	18		18
		SECOND YEAR	
AGRI 61, Fundamentals of Agricultural Extension and Communication	3	ABE 1, Fundamentals of Agricultural Engineering I	3
		CHEM 40, Basic Organic Chemistry	4
ABME 10, Foundations of Entrepreneurship	3	CHEM 40.1, Basic Organic Chemistry (Laboratory)	1
AGRI 42, Pest Management	3	AGRI 111, Introduction to Farming Systems	3
BOT 20, Elementary Plant Physiology	3	AGRI 171, Ethics, Laws and Policies in Agriculture	3
ECON 11, General Economics	3	MGT 101, Concepts and Dynamics of Management	3
Elective GE 1	3	Elective GE 2	3
HK 12 or 13, Collegiate or Advanced Collegiate Human Kinetics Activities	(2)	HK 12 or 13, Collegiate or Advanced Collegiate Human Kinetics Activities	(2)
NSTP 1, National Service Training Program I	(3)	NSTP 2, National Service Training Program II	(3)
	18		20
		THIRD YEAR	
BIO 30, Genetics	3	AAE 111, Farm Management	3
ABT 10, Traditional and Modern Biotechnology: Principles and Applications	3	AGRI 195, Research Methods in Agriculture and Food Science	3
AGRI 121, Introduction to Ecological Agriculture	3	PI 10, The Life and Works of Jose Rizal	3
STAT 162, Experimental Designs I	3	Major Course 2	3
Major Course I	3	Major Course 3	3
Elective GE 3	3	Specialization Course 1	3
	18		18
		MIDYEAR	
		Major 198/ Major 200a	3
			3
		FOURTH YEAR	
AGRI 199, Colloquium in Agriculture	1	Specialization Course 2	3
Major Course 4	3	Specialization Course 3	3
Major Course 5	3	Specialization Course 4	3
Major Course 6	3	Elective	3
COMM 10, Critical Perspectives in Communication	3	Major 200/ Major 200a	3
Major 200/ Major 190, Thesis/ Special Problems	3		15
Undergraduate Seminar	1		
	17		

TOTAL NUMBER OF UNITS 145

BACHELOR OF SCIENCE IN AGRICULTURAL BIOTECHNOLOGY

First Semester	*Units*	*Second Semester*	*Units*
		FIRST YEAR	
ABT 11, Introduction to Agricultural Biotechnology	1	CHEM 40, Basic Organic Chemistry	4
CHEM 18, University Chemistry	3	CHEM 40.1, Basic Organic Chemistry (Laboratory)	1
CHEM 18. 1, University Chemistry (Laboratory)	2	AGRI 22, Introduction to Livestock and Poultry Production	3
AGRI 21, Introduction to Animal Science	3	MATH 25, Fundamental Calculus	3
AGRI 31, Fundamentals of Crop Science I	3	BIO 30, Genetics	3
ARTS 1, Critical Perspectives in the Arts	3	KAS 1/ HIST 1, Kasaysayan ng Pilipinas/ Philippine History	3
STS 1, Science Technology and Society	3	ETHICS 1, Ethics and Moral Reasoning in Everyday Life	3
HK 11, Wellness and Basic Injury Management	(2)	HK 12 or 13, Collegiate or Advanced Collegiate Human Kinetics Activities	(2)
	18	NSTP 1, (ROTC or LTS or CWTS)	(3)
			20
		SECOND YEAR	
ABT 101, Fundamentals of Agricultural Biotechnology	3	ABT 103, Experimental Techniques in Agricultural Biotechnology I	3
CHEM 160, Introductory Biochemistry	3		
AGRI 32, Fundamentals of Crop Science II	3	Elective Course 1	3
MCB 11, Biology and Applications of Microorganisms	3	AGRI 51, Principles of Soil Science	3
AGRI 41, Principles of Crop Protection	3	CMSC 12, Fundamentals of Computer Science	3
Elective GE 1	3	BIO 101, Introductory Molecular Biology	3
HK 12 or 13, Collegiate or Advanced Collegiate Human Kinetics Activities	(2)	AGRI 42, Pest Management	3
		Elective GE 2	3
NSTP 2, (ROTC or LTS or CWTS)	(3)	HK 12 or 13, Collegiate or Advanced Collegiate Human Kinetics Activities	(2)
	18		21
		THIRD YEAR	
ABT 104, Experimental Techniques in Agricultural Biotechnology II	3	ABT 106, Molecular Markers	3
		ABT 107, Recombinant DNA Technology	3
STAT 162, Experimental Design I	3	ECON 11, General Economics	3
AGRI 61, Agricultural Extension Communication	3	Specialization Course 1	3
PI 10, The Life and Works of Jose Rizal	3	AGRI 171, Ethics, Laws and Policies in Agriculture	3
ABME 10, Foundations of Entrepreneurship	3		15
COMM 10, Critical perspectives in Communication	3		
Elective GE 3	3		
	21		
		MIDYEAR	
		ABT 198/ ABT 200a	3
			3
		FOURTH YEAR	
MGT 101, Concepts and Dynamics of Management	3	ABT 108, Issues and Regulation of Agricultural Biotechnology	3
Specialization Course 2	3		
Specialization Course 3	3	ABT 199, Undergraduate Seminar	1
Specialization Course 4	3	AGRI 199, Colloquium in Agriculture	1
ABT 200/200a	3	Elective Course 2	3
	15	ABT 200/ABT 190	3
			11

TOTAL NUMBER OF UNITS 142

BACHELOR OF SCIENCE IN FOOD SCIENCE AND TECHNOLOGY

First Semester	***Units***	***Second Semester***	***Units***
		FIRST YEAR	
FST 11, Fundamentals of Food Science and Technology	3	KAS 1/HIST 1, Kasaysayan ng Pilipinas/Philippine History	3
AGRI 21, Introduction to Animal Science	3	MCB 11, Biology and Applications of Microorganisms	3
AGRI 31, Fundamentals of Crop Science I	3	MATH 27, Analytic Geometry and Calculus I	3
ARTS 1, Critical Perspectives in Arts	3	CHEM 40, Basic Organic Chemistry	4
ETHICS 1, Ethics and Moral Reasoning in Everyday Life	3	CHEM 40.1, Basic Organic Chemistry (Laboratory)	1
CHEM 18, University Chemistry	3	PHYS 51, Elements of Physics	3
CHEM 18.1, University Chemistry Laboratory	2	PHYS 51.1, Elements of Physics Laboratory	2
HK 11, Wellness and Basic Injury Management	(2)	HK 12 or 13, Collegiate Human Kinetics Activities or Advanced Collegiate Human Kinetics Activities	(2)
	20		19
		SECOND YEAR	
Elective GE 1	3	STS 1, Science, Technology, and Society	3
Elective GE 2	3	MGT 101, Concepts and Dynamics of Management	3
ABME 10, Foundations of Entrepreneurship	3	CHEM 160, Introductory Biochemistry	3
CHEM 32, Quantitative Inorganic Analysis	3	MCB 180, Introductory Food Microbiology	3
CHEM 32.1, Quantitative Inorganic Analysis (laboratory)	2	FST 101, Food Chemistry I	3
STAT 101, Statistical Methods	3	FST 130, Food Engineering I	3
HK 12 or 13, Collegiate Human Kinetics Activities or Advanced Collegiate Human Kinetics Activities	(2)	HK 12 or 13, Collegiate Human Kinetics Activities or Advanced Collegiate Human Kinetics Activities	(2)
NSTP 1, National Service Training Program	(3)	NSTP 2, National Service Training Program	(3)
	17		18
		THIRD YEAR	
COMM 10, Critical Perspective in Communication	3	PI 10, Life and Works of Jose Rizal	3
FST 102, Food Analysis	4	AGRI 171, Ethics, Laws, and Policies in Agriculture	3
FST 131, Food Engineering II	3	AGRI 195, Research Methods in Agriculture and Food Science	3
FST 140, Food Processing I	3		
FST 141, Food Processing II	3	FST 111, Food Chemistry II	3
FST 167, Food Safety	3	FST 151, Sensory Evaluation of Food Products	3
	19	FST 200, Undergraduate Thesis	3
			18
		MIDYEAR	
		FST 198, Food Science and Technology Practicum	3
			3
		FOURTH YEAR	
Elective GE 3	3	Elective Course 1	3
FST 165, Food Quality Assurance	3	Elective Course 2	3
FST 170, Food Processing Management	3	FST 147, Principles of Product and Process Development	3
ABME 172, Product Ideation and Creation	3	FST 175, Food Laws and Regulations	3
FST 200, Undergraduate Thesis	3	FST 199, Under Graduate Seminar	1
	15	AGRI 199, Colloquium in Agriculture	1
			14

TOTAL NUMBER OF UNITS 143

COURSES

AGRICULTURAL SYSTEMS INSTITUTE

AGRICULTURE

AGRI 11. Introduction to Agriculture (1). Overview of agriculture with emphasis on Philippine agriculture. 1 hr (class). (1,2)

AGRI 51. Principles of Soil Science (3). Nature, properties, and management of Soils. 5 hrs (2 class, 3 lab), PR. None. (1,2)

AGRI 61. Fundamentals of Agricultural Extension Communication (3). Principles and methods of extension communication in agriculture. 3 hrs (2 class, 1 recit). (1,2)

AGRI 161. Introduction to Innovation and Entrepreneurship in Agriculture (3). Introduction to the concepts and practices of innovation and entrepreneurship in agriculture. 3 hrs (class). PR. COI. (2)

AGRI 195. Research Methods in Agriculture and Food Science (3). Research methodologies in agriculture and food science. 5 hrs (2 class, 3 lab). PR. STAT 162 or STAT 101. (1,2)

AGRI 199. Colloquium in Agriculture (1). 1 hr (class). PR. Senior standing. (1,2)

AGRICULTURAL SYSTEMS

ASYS 101. Introduction to Sustainable Agricultural Systems (3). Issues, properties, components and models of sustainable agricultural systems. 3 hrs (class). PR. None. (1)

ASYS 110. Organic Agriculture (3). Principles, policies and practices in organic agriculture. 5 hrs (2 class, 3 lab). PR. AGRI 32 and AGRI 22. (1)

ASYS 120. Crop-Animal Systems (3). Principles and practices of integrated crop-animal systems. 5 hrs (2 class, 3 lab). PR. AGRI 31 and AGRI 21. (2)

ASYS 130. Sustainable Management of Organic Agricultural Systems (3). Principles and practices in the sustainable management of organic agricultural systems. 5 hrs (2 class, 3 lab). PR. ASYS 110. (2)

ASYS 145. Participatory Methodologies in Agricultural Systems Research and Extension (3). Concepts, elements, and impacts of participatory approaches in agricultural systems research and extension. 5 hrs (2 class, 3 lab). PR. AGRI 61 and AGRI 111, or COI. (2)

ASYS 146. Agricultural Systems Analysis and Modeling (3). Systems analysis and modeling and their applications in agriculture. 5 hrs (2 class, 3 lab). PR. AGRI 31 and AGRI 21. (2)

ASYS 190. Special Problems (3). PR. COI. (1,2)

ASYS 191. Special Topics (1-3). Maybe taken twice provided that total number of units to be credited to the student's program will not exceed 4 units. PR. None. (1,2)

ASYS 198. Practicum (3). 150 hrs. PR. COI. (1,2, M)

ASYS 199. Undergraduate Seminar (1). 1 hr (class). Maybe taken twice. PR. None. (1,2)

ASYS 200. Undergraduate Thesis (6). PR. COI. (1,2, M)

ASYS 200a. Major Practice (6). PR. COI. (1, 2, M)

AGRICULTURAL EXTENSION

AERS 141. Community Survey and Program Planning (3). A survey of economic and social conditions in rural communities, formulation of a program of education for the use of agricultural teachers, extension agents, adult and education workers. 3 hrs (class). PR. COI. (1)

AERS 142. Concepts and Processes in Agricultural and Natural Resources Knowledge Systems (3). Concepts and processes in the utilization and exchange of knowledge in agriculture and natural resources. 3 hrs (class). PR. AGRI 61 or DEVC 10. (1)

AERS 154. Community Organization (3). Theory, practice, issues and problems in organizing community groups, and their implications for rural development. 3 hrs (class). PR. COI. (2)

AERS 160. Rural Sociology (3). Analysis of rural communities and rural institutions as they respond to and are affected by technological, social, economic and environmental policies and factors both within and outside the rural sector. 3 hrs (class). PR. COI. (1,2)

AERS 190. Special Problems (3). PR. COI. (1,2)

AERS 191 Special Topics (1-3). May be taken twice provided that total number of units to be credited to the student's program will not exceed 4 units. PR. None. (1,2)

AERS 198 Practicum (3). 150 hr PR. COI. (1, 2, M)

AERS 199. Undergraduate Seminar (1). 1 hr (class). May be taken twice. PR. None. (1,2)

AERS 200. Undergraduate Thesis. (6). PR. COI. (1, 2, M)

AERS 200a. Major Practice (6). PR. COI. (1, 2, M)

LANDSCAPE AGROFORESTRY

LAF 101. Landscape Agroforestry (3). Concepts, principles, analysis, and planning of landscape agroforestry. 3 hrs (3 class). PR. SFI 103. (1)

LAF 198. Practicum (3). 150 hrs. PR. COI. (1, 2, M)

LAF 199. Undergraduate Seminar (1). 1 hr (class) May be taken twice. PR. None. (1, 2)

LAF 200. Undergraduate Thesis (6). PR. COI. (1,2, M)

LAF 200a. Major Practice (6). PR. COI. (1, 2, M)

SOIL SCIENCE

SOIL 101. Agricultural Geology (3). common soil-forming rocks and minerals, geologic processes and agencies and landforms in relation to agriculture. 5 hrs (2 class, 3 lab), PR. AGRI 51. (1)

SOIL 110. Soil Survey and Classification (3). Survey and classification of soils based on their morphology, genesis and properties; application in agriculture, resource use and development. 5 hrs (2 class, 3 lab). PR. SOIL 101 or COI. (2)

SOIL 111. Soil and Land Use (3) Soil and land resources data and information for land use planning; their interpretation and application; planning and environmental assessment of land use. 5 hrs (2 class, 3 lab). PR. AGRI 51 or COI. (1)

SOIL 120. Soil Microbiology (3). Nutritional and metabolic properties of major groups of soil microorganisms; comparative ecology, selective isolation and cultivation of soil microorganisms; biochemical activities of soil microflora in relation to soil fertility. 5 hrs (2 class., 3 lab); PR. AGRI 51 or COI. (1)

SOIL 130. Soil Physics (3). Physical properties of soils in relation to plant growth, their measurement and analysis. 5 hrs (2 class., 3 lab PR. AGRI 51 or COI. (2)

SOIL 140. Soil Chemistry (3). Nature and composition of soils; physico-chemical properties and reactions; chemical processes including ionic equilibria. 3 hrs (class) PR. AGRI 51 or COI. (2)

SOIL 142. Fertilizers and Their Reaction with the Soil (3). Manufacture, processing and properties of fertilizers; their reaction with and the residual effect on the soil. 3 hrs (3 class) PR. AGRI 51 or COI. (2)

SOIL 150. Soil Fertility (3). Soil nutrient elements and their availability in relation to soil properties; evaluation of soil fertility status; use of fertilizers and other soil amendments. 3 hrs (3 class), PR. AGRI 51 or COI. (1,2)

SOIL 151. Soil Fertility Evaluation (3). Concepts and techniques in assessing soil fertility; soil and plant analysis; pot and field fertilizer experiments; nutrient deficiency symptoms. 7 hrs (1 class; 6 lab), PR. SOIL140 and SOIL 150 or COI. (2)

SOIL 161. Spatial Analysis and Soil Mapping (3). Geographical analysis of aerial photos, satellite images, and spatial information as applied to land use, soil, and resource management and mapping.5 hrs (2 class, 3 lab), PR. AGRI 51 or COI. (1)

SOIL 170. Soil Conservation and Management (3). Soil deterioration and its control; maintenance and improvement of soil fertility and productivity. 5 hrs (2 class, 3 lab), PR. AGRI 51 or COI. (1)

SOIL 190. Special Problems in Soil Science (3). PR. COI. (1,2, M)

SOIL 191. Special Topics (1-3). May be taken twice provided that the total number of units to be credited to the student's program will not exceed 4 units. PR. None. (1,2)

SOIL 198. Practicum (3). 150 hrs. PR. COI. (1, 2, M)

SOIL 199. Undergraduate Seminar (1). 1 hr (class). May be taken twice. PR. None. (1,2)

SOIL 200. Undergraduate Thesis (6). PR. COI. (1, 2, M)

SOIL 200a. Major Practice (6). PR. COI. (1, 2, M)

INSTITUTE OF ANIMAL SCIENCE

AGRICULTURE

AGRI 21. Introduction to Animal Science (3). Principles of breeding, physiology and nutrition in relation to production, processing, and marketing of animal products. 5 hrs (2 class, 3 lab). PR. None (1,2)

AGRI 22. Introduction to Livestock and Poultry Production (3). Management of farm animals for the efficient production of meat, milk, eggs and other animal products. 5 hrs (2 class, 3 lab). PR. AGRI 21. (1,2)

ANIMAL SCIENCE

ANSC 101. Anatomy and Physiology of Farm Animals (3). Comparative anatomy and physiology of livestock and poultry. 5 hrs (2 class, 3 lab). PR. AGRI 22 or COI. (1,2)

ANSC 102. Principles of Animal Nutrition (3). Composition, functions, and metabolism of various nutrients; nutritive requirements for maintenance, growth, reproduction, lactation, and other body functions of farm animals. 3 hrs (class). PR. AGRI 21 or COI. (1,2)

ANSC 103. Principles of Animal Breeding (3). Genetics and statistical bases of animal improvement; topics in reproduction, including artificial insemination. 5 hrs (2 class, 3 lab). PR. AGRI 22 and BIO 30. (1,2)

ANSC 104. Livestock Sanitation and Disease Control (3). Principles and practices in the prevention and control of common diseases in livestock. 5 hrs (2 class, 3 lab). PR. ANSC 101 or COI. (1,2)

ANSC 105. Poultry Sanitation and Disease Control (3). Prevention and control of common diseases of poultry. 5 hrs (2 class, 3 lab). PR. ANSC 101 or COI. (1,2)

ANSC 106. Slaughter and Meat Evaluation (3). Antemortem and post-mortem inspection of slaughter animals, slaughtering, carcass evaluation and meat hygiene. 5 hrs (2 class, 3 lab). PR. AGRI 22 or COI. (1,2)

ANSC 111. Swine Production (3). Breeding, feeding, and management of swine; economics of swine production. 5 hrs (2 class, 3 lab). PR. AGRI 22 or COI. (1,2)

ANSC 116. Poultry Production (3). Principal factors in commercial poultry production. 5 hrs (2 class, 3 lab). PR. AGRI 22 or COI. (1,2)

ANSC 117. Poultry Management (2). Practices of incubation, breeding, rearing, feeding, judging, selection, and layer management.

6 hrs (lab). PR. ANSC 116 or COI. (1,2)

ANSC 121. Beef Production (3). Breeding, feeding and management of beef cattle and carabaos in the range and in confinement; economics of beef production. 5 hrs (2 class, 3 lab). PR. AGRI 22 or COI. (1,2)

ANSC 122. Dairy Production (3). Breeding, feeding, and management of dairy animals; milking methods and the production of clean milk. 5 hrs (2 class, 3 lab). PR. AGRI 22 or COI. (1,2)

ANSC 131. Meat Processing (3). Meat selection, identification of standard cuts, meat curing and other meat preservation methods. 5 hrs (2 class, 3 lab). PR. AGRI 22 or COI. (1,2)

ANSC 132. Comminuted Meat Products (3). Structure, chemical composition and processing, characteristics of meat; and processing of comminuted products. 5 hrs (2 class, 3 lab) PR. AGRI 21 or COI. (1,2)

ANSC 135. Introduction to Dairy Technology (3). Fundamentals of milk and milk products processing. 5 hrs (2 class, 3 lab). PR. CHEM 40 or COI. (1,2)

ANSC 136. Milk Hygiene (3). Hygiene in milk production, processing, and distribution. 5 hrs (2 class, 3 lab). PR. ANSC 135. (1)

ANSC 137. Cheese Technology (3). Principles and techniques in the manufacture of natural and processed cheese. 5 hrs (2 class, 3 lab). PR. ANSC 135 or COI. (1)

ANSC 142. Nutritional Diseases of Farm Animals (3). Recognition and management of disease and disorders attributed to nutrient deficiencies and toxicities affecting farm animals. 5 hrs (2 class, 3 lab). PR. ANSC 102 or COI. (2)

ANSC 143. Livestock and Poultry Feeding (3). Composition and use of feeds for farm animals; formulation of rations and feeding practices. 5 hrs (2 class, 3 lab). PR. AGRI 22 or COI. (1,2)

ANSC 144. Feed Formulation for Farm Animals (3). Feed formulation for swine, poultry and ruminant using traditional and computer-aided methods. 7 hrs (1 class, 6 lab). PR. ANSC 143. (1)

ANSC 145. Animal Feed Processing (3). Processing of animal feeds, its effects on animal nutrition, health, and production performance. 5 hrs (2 class, 3 lab). PR. ANSC 102. (2)

ANSC 161. Methods in Animal Breeding (3). Measurement and inheritance of economically important traits of farm animals; systems of breeding and selection; inbreeding and hybridization in farm animals. 3 hrs (class). PR. ANSC 103 or COI. (1,2)

ANSC 172. The Fundamentals of Animal Climatology (3). Mechanics of thermo-regulation and animal adaptations; thermal stress; the problems associated with the improvement of livestock production in tropical climate. 5 hrs (2 class, 3 lab). PR. ANSC 101 or COI. (1,2)

ANSC 173. Reproduction in Farm Animals (3). Anatomy and physiology of reproduction and techniques for improving reproductive efficiency in farm animals. 5 hrs (2 class, 3 lab). PR. ANSC 101 or COI. (1)

ANSC 190. Special Problems (3). PR. COI. (1,2)

ANSC 191. Special Topics (1-3). May be taken twice provided that the total number of units to be credited to the student's program will not exceed 4 units. PR. COI. (1,2)

ANSC 198. Practicum (3). PR. COI. (1,2,M)

ANSC 199. Undergraduate Seminar (1). 1 hr (class). May be taken twice. PR. None. (1,2)

ANSC 200. Undergraduate Thesis (6). PR. COI. (1, 2, M)

ANSC 200a. Major Practice (6). PR. COI. (1, 2, M)

AGRICULTURAL BIOTECHNOLOGY

ABT 120. Animal Biotechnology (3). Fundamentals of animal biotechnology as applied to livestock and poultry production. 3 hrs (class). PR. ABT 101 or COI. (2)

ABT 190. Special Problems (3). PR. COI. (1,2)

ABT 191. Special Topics (1-3). May be taken twice provided that the total number of units to be credited to the student's program will not exceed 4 units. PR. None. (1,2)

ABT 198. Practicum (3). PR. COI. (1, 2, M)

ABT 199. Undergraduate Seminar (1). 1 hr (class). Maybe taken twice. PR. COI. (1,2)

ABT 200. Undergraduate Thesis (6). PR. COI. (1, 2, M)

ABT 200a. Major Practice (6). PR. COI. (1, 2, M)

INSTITUTE OF CROP SCIENCE

AGRICULTURE

AGRI 31. Fundamentals of Crop Science I (3). Introduction to crop science and basic concepts in crop production. 5 hrs (2 class, 3 lab). PR. None. (1,2)

AGRI 32. Fundamentals of Crop Science II (3). Principles and practices of crop production. 5 hrs (2 class, 3 lab). PR. AGRI 31. (1,2)

AGRI 111. Introduction to Farming Systems (3). Principles and determinants of farming systems; procedures for designing and evaluating location-specific farming systems options. 5 hrs (2 class, 3 lab). PR. AGRI 32 and AGRI 22 or COI. (1,2)

AGRI 121. Introduction to Ecological Agriculture (3). Principles and practices of ecological agriculture 3 hrs (class), PR. AGRI 32 or COI. (1, 2)

AGRI 171. Ethics, Laws and Policies in Agriculture (3). Ethical

issues, laws, and policies in agriculture. 3 hrs (2 class, 1 recit). PR. None. (1,2)

AGRONOMY

AGR 110. Grain Crops Production (3). Culture and management of grain crops with emphasis on rice, corn, wheat, sorghum, soybean and mungbean. 5 hrs (2 class, 3 lab). PR. AGRI 31. (1,2)

AGR 114. Annual Industrial Crops Production (3). Culture and management of selected industrial field crops with emphasis on sugarcane, cotton, ramie, jute, kenaf, sunflower, sesame and tobacco. 5 hrs (2 class, 3 lab). PR. AGRI 31. (2)

AGR 116. Multiple Cropping (3). Concepts, production technologies and research methodology in multiple cropping 5 hrs (2 class, 3 lab). PR. AGRI 31 and AGRI 32. (2)

AGR 118. Pasture and Feed Crops Production (3). Culture and management of crops intended for feed and pasture and forage crops. 5 hrs (2 class, 3 lab). PR. AGRI 31. (1)

AGR 141. Field Crop Physiology (3) Physiological concepts and processes and their relationship with crop yield with emphasis on major field crop. 5 hrs (2 class, 3 lab). PR. AGRI 32 or BOT 20. (1, 2)

AGR 150. Methods in Plant Breeding I (3). Methods and techniques in the improvement of crop plants. 5 hrs (2 class, 3 lab). PR. CRSC 105. (1,2)

AGR 153. Methods in Plant Breeding II (3). Mutation breeding, wide hybridization, and application of advances in biotechnology in crop improvement. 5 hrs (2 class, 3 lab). PR AGR 150. (1)

AGR 160. Plant Genetic Resources Conservation and Management (3). Concepts and methods of plant genetic resources collection, conservation, evaluation, documentation and use. 5 hrs. (2 class, 3 lab). PR. CRSC 105 or COI. (1)

AGR 170. Fundamentals of Seed Technology (3). Concepts and methodologies in seed production, processing, storage, distribution and quality control. 5 hrs (2 class, 3 lab). PR. AGRI 32, AGRI 42 and BOT 20 or COI. (1,2)

AGR 172. Seed Storage (3). Principles and methods of seed storage 5 hrs. (2 class, 3 lab). PR. AGRI 32 or COI. (1)

AGR 190. Special Problems (3). PR. COI. (1,2,M)

AGR 191. Special Topics (1-3). May be taken twice provided that total number of units to be credited to the student's program will not exceed 4 units. PR. None. (1,2,M)

AGR 192. Methods in Crop Research (3). Experimental methods for developing and evaluating crop production technology. 3 hrs (class). PR. AGRI 31 or COI. (1,2)

AGR 198. Practicum (3). 150 hrs. PR. COI. (1,2,M)

AGR 200. Undergraduate Thesis (6). PR. COI. (1,2,M)

AGR 200a. Major Practice (6). PR. COI. (1,2,M)

CROP SCIENCE

CRSC 101. Tropical Annual Crops Production and Management (3). Principles and practices in the production and management of tropical annual crops. 5 hrs (2 class, 3 lab). PR. AGRI 32 or COI. (1,2)

CRSC 102. Tropical Perennial Crops Production and Management (3). Principles underlying practices in the production and management of tropical perennial crops. 5 hrs (2 class, 3 lab). PR. AGRI 32 or COI. (1,2)

CRSC 105. Principles of Plant Breeding (3). Development, evaluation and maintenance of improved crop plants. 3 hrs (class). PR. BIO 30. (1, 2)

CRSC 154. Crop Variety Registration and Protection (3). Classification of vegetable species and varieties with emphasis on adaptation, principles and practices in variety maintenance; field postharvest and consumer acceptability evaluations. 7 hrs. (1 class, 6 lab). PR. CRSC 105 or COI. (2)

CRSC 199. Undergraduate Seminar (1). May be taken twice. 1 hr (class). PR. COI. (1, 2)

HORTICULTURE

HORT 104. Plant Propagation and Nursery Management (3). Principles and practices in the sexual & asexual propagation of woody and herbaceous plants; care and management of nurseries. 5 hrs (2 class, 3 lab). PR. AGRI 32 or COI. (1, 2)

HORT 105. Therapeutic Horticulture (3). Utilization of Horticulture for Human Health and well-being (3). 5 hrs (2 class, 3 lab). PR. AGRI 31 or COI. (2)

HORT 107. Organic Horticulture (3). Principles and practices in the utilization of farm wastes and other biological materials in horticulture. 5 hrs (2 class, 3 lab). PR. CRSC 101 or CRSC 102 or COI. (2)

HORT 108. Urban Horticulture (3). Production and management practices for horticultural crops in Urban areas. 5 hrs (2 class, 3 lab). PR. AGRI 32 or COI. (2)

HORT 110. Major Tropical Fruits (3). Botany, production and management of major tropical fruits. 5 hrs (2 class, 3 lab). PR. CRSC 102. (2)

HORT 111. Plantation Crop Production and Management (3). Botany, production and management of plantation crops with emphasis on coconut, abaca, coffee, cacao and rubber. 5 hrs (2 class, 3 lab). PR. CRSC 102. (1)

HORT 112. Production and Handling of Tropical Vegetable Seeds (3). Production and handling of vegetable seeds; environmental and genetic factors affecting seed production. 5 hrs (2 class, 3 lab). PR. CRSC 101. (2)

HORT 114. Commercial Vegetable Production (3). Technologies in vegetable production and management and their relationships to physical environments, biological and socioeconomic factors. 5 hrs

(2 class, 3 lab). PR. CRSC 101. (1, 2)

HORT 117. Plant Arts (3). Principles and techniques of utilizing horticultural plants or plant parts in arts. 7hrs (1 class, 6 lab). PR. AGRI 31 or COI. (2)

HORT 121. Major Ornamental Plants in the Tropics (3). Botany, culture and ecophysiology of the major ornamental crops in the tropics. 5 hrs (2class, 3 lab). PR. CRSC 101 or CRSC 102 or COI. (1)

HORT 122. Orchids and their Culture (3). Botany, breeding and culture of commercial and botanical orchids. 5 hrs (2 class, 3 lab). PR. HORT/BOT 132 or COI. (2)

HORT 124. Landscape Horticulture (3). Theories and practices in landscaping, site planning, design analysis, construction, maintenance and nursery management. 5 hrs (2 class, 3 lab). PR. AGRI 32 or COI. (2)

HORT 126. Fundamentals of Turfgrass Management (3). Principles and practices in sod production nursery, turfgrass utilization, establishment and maintenance. 5 hrs (2 class, 3 lab). PR. AGRI 32 or COI. (1)

HORT 127. Landscape Establishment and Maintenance (3). Principles and Practices of Managing Man-made Landscapes. 5 hrs (2 class, 3 lab). PR. HORT 124 or COI. (1)

HORT 128. Interior Landscaping (3). Principles and Practices of Interior Landscaping. 5 hrs (2 class, 3 lab). PR. HORT 124 or COI. (1)

HORT 129. Plantscape-Hardscape Relations (3). Integration of Plants with Physical Structures in Landscaping. 5 hrs (2 class, 3 lab). PR. HORT 124 or COI. (2)

HORT 131 (or Bot 131). Inorganic Plant Nutrition (3). Principles of mineral nutrition of higher plants. 5 hrs (2 class, 3 lab). PR. BOT 20. (1,2)

HORT 132 (or BOT 132). Plant Growth (3). The nature and processes of growth in plants, including the role played in the process by phytohormones. 5 hrs (2 class, 3 lab). PR. BOT 20. (1,2)

HORT 133. Plant Tissue Culture (3). Principles and practices in the in vitro culture of plants. 5 hrs (2 class, 3 lab). PR. BOT. 20 or COI. (2)

HORT 134. Regulatory Processes in Horticultural Crop Production Practices (3). Physiological, ecological and genetic bases of the various production techniques in horticulture. 5 hrs (2 class, 3 lab). PR. AGRI 32 and BOT 20 or COI. (2)

HORT 180. Postharvest Handling and Storage of Perishable Crops (3). Postharvest deterioration; technology of handling and storage of perishable crops. 3 hrs (class). PR. BOT 20 or COI. (1,2)

HORT 180.1. Postharvest Handling and Storage of Perishable Crops Laboratory (2). 6 hrs (lab). PR. HORT 180 or COI. (1,2)

HORT 181. Handling, Processing and Grading of Plantation Crop Products (3). Handling, processing and grading of plantation crop products, with emphasis on coconut, abaca, coffee, cacao and rubber. 5 hrs (2 class, 3 lab). PR. CRSC 102 or COI. (2)

HORT 190. Special Problems (3). PR. COI. (1,2)

HORT 191. Special Topics (1-3). May be taken twice provided that total number of units to be credited to the student's program will not exceed 4 units. PR. None. (1,2)

HORT 198. Practicum (3). 150 hrs. PR. COI. (1,2,M)

HORT 200. Undergraduate Thesis (6). PR. COI. (1,2,M)

HORT 200a. Major Practice (6). PR. COI. (1,2,M)

AGRICULTURAL BIOTECHNOLOGY

ABT 10. Traditional and Modern Biotechnology: Principles and Applications (3). 3 hrs (class). PR. None (1,2)

ABT 11. Introduction to Agricultural Biotechnology (1). Overview of agricultural biotechnology; implications on Philippine and global agriculture. 1 hr (class). PR. None. (1,2)

ABT 101. Fundamentals of Agricultural Biotechnology (3). Principles and applications of agricultural biotechnology. 3 hrs (class). PR. BIO 30 and CHEM 40. (1,2)

ABT 103. Experimental Techniques in Agricultural Biotechnology I (3). Laboratory tools, procedures, and protocols in plant, animal, food and crop protection biotechnology. 7 hrs (1 class, 6 lab). PR. ABT 101 or COI. (1,2)

ABT 104. Experimental Techniques in Agricultural Biotechnology II (3). Laboratory tools, procedures, and protocols in plant, animal, food and crop protection biotechnology. 7 hrs (1 class, 6 lab). PR. ABT 101 or COI. (1,2)

ABT 106. Molecular Markers (3). Principles and applications of molecular marker technologies in agriculture, medicine, industry and environment. 5 hrs (2 class, 3 lab). PR. ABT 101 or COI. (1,2)

ABT 107. Recombinant DNA Technology (3). Principles and applications of recombinant DNA technology. 3 hrs (class). PR. ABT 101 or COI. (1,2)

ABT 108. Issues and Regulation of Agricultural Biotechnology (3). Technological and social issues and science-based assessment and regulation of agricultural biotechnology. 3 hrs (class). PR. ABT 107 or COI. (1,2)

ABT 190. Special Problems (3). PR. COI. (1,2)

ABT 191. Special Topics (1-3). May be taken twice provided that the total number of units to be credited to the student's program will not exceed 4 units. PR. None. (1,2)

ABT 198. Practicum (6). 150 hrs. PR. COI. (1,2,M)

ABT 199. Undergraduate Seminar (1). 1 hr (class). May be taken twice. PR. COI (1,2)

ABT 200. Undergraduate Thesis (6). PR. COI. (1,2,M)

ABT 200a. Major Practice (6). PR. COI. (1,2,M)

INSTITUTE OF FOOD SCIENCE AND TECHNOLOGY

FOOD SCIENCE AND TECHNOLOGY

FST 11. Fundamentals of Food Science and Technology. (3). Introduction to food science and technology; basic principles of food science. 3 hours (class). PR. None (1,2)

FST 101. Food Chemistry I (3). Chemical composition of foods and its effect on texture, flavor, color and nutritive value. 5 hrs (2 class, 3 lab). PR. CHEM 40 and CHEM 40.1. (1,2)

FST 102. Food analysis (4). Application of chemical, physical, biological and sensory analysis of foods and food products, with reference to the laboratory operations of a food manufacturing plant. 8 hrs (2 class, 6 lab). PR FST 101 and CHEM 32 and CHEM 32.1. (1,2)

FST 111. Food Chemistry II (3). Physico-chemical aspects of the processes and interactions that occur during the manufacture, handling, and storage of foods. 3 hrs (class). PR. FST 101, MATH 27, PHYS 51, and PHYS 51.1. (1,2)

FST 122. Fundamentals of Food Fermentation (3). Types of Fermentation; pathways and processing of fermented food products. 5 hrs (2 class, 3 lab). PR. CHEM 160 and MCB 11. (1)

FST 130. Food Engineering I (3). Principles of mass and heat transfer applied to food processing; physical and properties of food materials. 5 hrs (2 class, 3 lab). PR. MATH 27, PHYS 51, and PHYS 51.1. (1,2)

FST 131. Food Engineering II (3). Thermal processing, dehydration, chilling, freezing, evaporation, size reduction and packaging, and handling of food materials. 5 hrs (2 class, 3 lab). PR. FST 130. (1,2)

FST 132. Food Engineering III (3). Principles of steam generation, extraction, food extrusion, process control, food processing, plant, waste and by-products management. 5 hrs (2 class, 3 lab). PR. FST130. (2)

FST 138. Food Packaging. Food packaging systems and Interactions, properties of packaging materials, labeling issues and trends. 5 hrs (2 class, 3 lab). PR. FST 141 or COI (2)

FST 140. Food Processing I (3). Principles of food processing; food fermentation, thermal processing, dehydration and low temperature preservation. 5 hrs (2 class, 3 lab). PR. MCB 180 and FST 130 (1,2)

FST 141. Food Processing II (3). Principles of food processing; water activity, concentration processes, use of additives, food packaging and food laws. 5 hrs (2 class, 3 lab). PR. MCB 180 and FST 130. (1,2)

FST 145. Fruits and Vegetables Processing (3). Principles of fruit and vegetable processing, canning, drying, dehydration, freezing, sugar concentration. 5 hrs (2 class, 3 lab). PR. FST 101. (1)

FST 147. Principles of Food Product and Process Development (3). Systematic way of product and process development from product idea generation to screening, to product formulation, and viability testing. 3 hrs (class). PR. FST 140 and FST 141 or COI. (2)

FST 151. Sensory Evaluation of Food Products (3). Fundamental aspects of subjective and objectives evaluation of food quality; certain basic influences in food acceptance patterns. 5 hrs (2 class, 3 lab). PR. STAT 101. (1,2)

FST 165. Food Quality Assurance (3). Principles and methods of food quality assurance. 3 hrs (class). PR. FST 140 or FST 141. (1,2)

FST 166. Food Hygiene and Sanitation (3). Fundamentals of food hygiene and evaluation of sanitation in food processing and food service establishment. 5 hrs (2 class, 3 lab). PR. MCB 11. (2)

FST 167. Food Safety (3). Essentials of food safety from farm to fork continuum; issues and concerns of safety in the food supply chain; hazards and contaminants in food and food products and the food safety measures in different stages of a food product flow. 5 hrs (2 class, 3 lab). PR. MCB 11. (1,2)

FST 170. Food Processing Management (3). Organization, production management, resource allocation, process quality control and information System. 3 hrs (class). PR. FST 140 or FST 141. (1,2)

FST 175. Food Laws and Regulations (3). Philippine and International food laws and regulations related to food quality and safety. 3 hrs (class). PR. None (1,2)

FST 190. Special Problems (3). PR. COI. (1,2,M)

FST 191. Special Topics (1-3). Maybe taken twice provided that the total number of units to be credited to the student's program will not exceed 4 units. PR. None. (1,2)

FST 198. Practicum (3). 144 hrs. PR. FST 140 or FST 141. (1,2,M)

FST 199. Undergraduate Seminar (1). 1 hr. (class). May be taken twice. (1,2)

FST 200. Undergraduate Thesis (6). PR. COI. (1, 2, M)

AGRICULTURAL BIOTECHNOLOGY

ABT 115 (or FST 115). Food Biotechnology (3). Principles and applications of food biotechnology. 3 hrs (class). PR. MCB 11 and CHEM 160. (1)

ABT 190. Special Problems (3). PR. COI. (1,2)

ABT 191. Special Topics (1-3). May be taken twice provided that the total number of units to be credited to the student's program will not exceed 4 units. PR. None. (1,2)

ABT 198. Practicum (3). PR. COI. (1,2,M)

ABT 199. Undergraduate Seminar (1). 1 hr. (class). May be taken twice. PR. COI. (1,2)

ABT 200. Undergraduate Thesis (6). PR. COI. (1,2,M)

ABT 200a. Major Practice (6). PR. COI. (1,2,M)

INSTITUTE OF WEED SCIENCE, ENTOMOLOGY AND PLANT PATHOLOGY

AGRICULTURE

AGRI 41. Principles of Crop Protection (3). Identification, biology and ecology of different pests and their natural enemies. 5 hrs (2 class, 3 lab). (1,2)

AGRI 42. Pest Management (3). Philosophies, strategies and methods in pest management. 5 hrs (2 class, 3 lab). PR. AGRI 41. (1,2)

ENTOMOLOGY

ENT 101. General Entomology (3). Introduction to insect adaptations; structural, functional and developmental systems; taxonomy and ecology, 5 hrs (2 class, 3 lab). PR. None. (1,2)

ENT 110. Insect Morphology (3). Phylogenetic study of the external and internal structures of insects and other arthropods, 7 hrs (1 class, 6 lab). PR. ENT 101 or COI. (1,2)

ENT 120. Insect Physiology (3). Comparative physiology of insects; functional mechanisms and physiological bases of behavior, 5 hrs (2 class, 3 lab). PR. (ENT 101 and CHEM 40) or COI (1)

ENT 125. Insecticide Toxicology (3). Chemical and physical properties, formulations, biological effects and behavior of insecticides. 5 hrs (2 class, 3 lab). PR. ENT 101 or COI (2)

ENT 137 (or BIO 137). Insect Genetics (3). Genetic concepts and mechanisms in insects, and their application in taxonomy, pest management and genetic improvement of beneficial species. 5 hrs (2 class, 3 lab). PR. (ENT 101 and BIO 30) or COI (1,2)

ENT 140. Insect Taxonomy (3). Classification, biology and evolutionary relationships among the higher insect taxa; taxonomic methods; curating insect collections, 7 hrs (1 class, 6 lab). PR. ENT 110 or COI. (2)

ENT 146. Acarology (3). Taxonomy and evolutionary relationships of the Acari; their habitats, trophic functions, life cycles, behavior and distribution. 5 hrs (2 class, 3 lab). PR. ENT 101 and COI. (2)

ENT 151. Insect Ecology (3). Dynamics of insect population, specifically their abundance, regulation, distribution and mensuration; community theories pertaining to natural control of pest species. 5 hrs (2 class, 3 lab). PR. ENT 140 or COI. (2)

ENT 170. Crop Protection Entomology (3). Bionomics and control of the major agricultural insect and mite pests of crop plants. 5 hrs (2 class, 3 lab). PR. AGRI 42 or COI. (1)

ENT 172. Biological Control of Insect Pests (3). Principles and methods of biological control of insect pests. 5 hrs (2 class, 3 lab). PR. AGRI 42 or COI. (2)

ENT 174. Postharvest and Storage Pests (3). Bioecology, identification and control of the major and postharvest/storage pests of grains, vegetables, fruits, ornamental and medicinal crops. 5 hrs (2 class, 3 lab). PR. AGRI 42 or AGRI 32 or COI. (2)

ENT 176. Medical and Veterinary Entomology (3). Bionomics, identification and control of the major arthropods affecting man and domestic animals. 5 hrs (2 class, 3 lab). PR. ENT 101 or COI. (1)

ENT 178. Management of Non-Farm Pests (3). Biology, ecology and management of non-farm pests, with emphasis on insects. 5 hrs (2 class, 3 lab) PR. ENT 101 or COI. (1)

ENT 190. Special Problems (3). PR. COI. (1,2,M)

ENT 191. Special Topics (1-3). May be taken twice provided that total number of units to be credited to the student's program will not exceed 4 units. (1,2,M)

ENT 195. Entomological Techniques (3). Principles of insect micrology and general insect rearing methods. 7 hrs (1 class, 6 lab). PR. ENT 101 or COI. (2)

ENT 198. Practicum (3). 150 hrs. PR. COI. (1,2,M)

ENT 199. Undergraduate Seminar (1). 1 hr. (class). May be taken twice. (1,2,M)

ENT 200. Undergraduate Thesis (6). PR. COI. (1,2,M)

ENT 200a. Major Practice (6). PR. COI. (1,2,M)

PLANT PATHOLOGY

PPTH 101. Principles of Plant Pathology (3). History, nature and causes of plant diseases, development, analysis, forecasting, assessment and control of disease in plant populations. 3 hrs (class). PR. AGRI 41 or MCB 11. (1,2)

PPTH 102. Control of Plant Diseases (3). Theories and practices in plant disease control. 5 hrs (2 class, 3 lab). PR. PPTH 101 or AGRI 42. (1)

PPTH 103. Introductory Phytobacteriology (3). Nature and biology of bacterial pathogens of plants; their classification, life cycles in relation to disease development, host physiological responses to infection, ecology and control. 5 hrs (2 class, 3 lab). PR. AGRI 41 or MCB 11. (1,2)

PPTH 104. General Mycology (3). Morphology, life cycles and taxonomy of fungi. 5 hrs (2 class, 3 lab). PR. None. (1,2)

PPTH 106. Principles of Phytonematology (3). Introduction to methodology, morphology, biology, ecology, identification, pathogenesis and control of plant parasitic nematodes. 5 hrs (2 class, 3 lab). PR. AGRI 41. (1,2)

PPTH 112. Biological Control of Plant Pathogens (3). Nature,

mechanisms and interaction involved in the biological control of plant pathogens. 5 hrs (2 class, 3 lab). PR. PPTH 101. (2)

PPTH 114. Introduction to Fungal Plant Pathogens (3). Identification and biology of plant pathogenic fungi, disease cycles, and control. 5 hrs (2class, 3 lab). PR. AGRI 41 or COI. (1,2)

PPTH 115. Introductory Plant Virology (3). Nature of plant viruses and symptoms of diseases produced; principles and techniques of transmission; purification, serology and electron microscopy. 5 hrs (2 class, 3 lab). PR. AGRI 41 or MCB 11. (1,2)

PPTH 121. Postharvest Pathology (3). The nature, pathogenesis and control of postharvest diseases of crops. 5 hrs (2 class, 3 lab). PR. PPTH 101. (1).

PPTH 131. Research in Plant Pathology (3). Research methods in plant diseases. 7 hrs (1 class, 6 lab). PR. PPTH 101. (2)

PPTH 141. Principles of Plant Disease Epidemiology (3). Elements of plant disease, epidemic systems, effects of environment, pathogen dispersal and disease spread, basic epidemic models, genetic basis of epidemics. 5 hrs (2 class, 3 lab). PR. PPTH 101 or COI. (1,2)

PPTH 190. Special Problems (3). PR. COI. (1,2,M)

PPTH 191. Special Topics (1-3). May be taken twice provided that total number of units to be credited to the student's program will not exceed 4 units. PR. None. (1,2,M)

PPTH 198. Practicum (3). 150 hrs. PR. COI. (1,2,M)

PPTH 199. Undergraduate Seminar (1). 1 hr. (class). May be taken twice. PR. COI. (1,2)

PPTH 200. Undergraduate Thesis (6). PR. None. (1,2,M)

PPTH 200a. Major Practice (6). PR. COI. (1, 2, M)

WEED SCIENCE

WSC 101. Fundamentals of Weed Science. (3). Nature and characteristics of weeds, principles of weed science, and their application to weed management. 3 hrs (3 class). PR. AGRI 41 or COI. (1,2)

WSC 111. Biology of Weeds (3). Establishment, reproduction, and dispersal of weeds, relationship with other plants and changes in weed population. 5 hrs (2 class, 3 lab). PR. BOT 20 or COI. (1)

WSC 121. Weed Ecology (3). Interaction of weeds and the environment; applications to weed management within the agroecosystems. 3 hrs (3 class). PR. COI. (1)

WSC 141. Weeds and Their Management (3). Weed identification, methods of weed control, and introduction to herbicides and factors influencing their use. 5 hrs (2 class, 3 lab). PR. COI (1,2)

WSC 142. Herbicides and Their Behavior in Plants and the Environment (3). Structure, classification and mode of action of herbicides; absorption, translocation, degradation and fate in plants and the environment. 3 hrs (3 class). PR. CHEM 40 and BOT 20, or COI. (1)

WSC 145. Biological Control of Weeds (3). Nature and mechanisms of biological control agents (BCAs) and their role in integrated weed management. 5 hrs (2 class, 3 lab). PR. WSC 101 or COI. (2)

WSC 190. Special Problems (3). PR. COI. (1,2,M)

WSC 198. Practicum (3). 150 hrs. PR. COI. (1,2,M)

WSC 199. Undergraduate Seminar (1). 1 hr. (1 class). PR. COI. (1,2)

WSC 200. Undergraduate Thesis (6). PR. COI. (1,2,M)

WSC 200a. Major Practice (6). 240 hrs. PR. COI. (1,2,M)

AGRICULTURAL BIOTECHNOLOGY

ABT 140. Biotechnology in Crop Protection (3). Principles and applications of biotechnology in the management of insect pests, plant diseases, and weeds, 3 hrs (class). PR. AGRI 42 and BIO 30 or COI. (2)

ABT 190. Special Problems (3). PR. COI. (1,2)

ABT 191. Special Topics (1-3). May be taken twice provided that the total number of units to be credited to the student's program will not exceed 4 units. PR. None. (1,2)

ABT 198. Practicum (6). PR. COI. (1,2,M)

ABT 199. Undergraduate Seminar (1). 1 hr. (class). May be taken twice. PR. COI. (1,2)

ABT 200. Undergraduate Thesis (6). PR. COI. (1,2,M)

ABT 200a. Major Practice (6). PR. COI. (1,2,M)