

AGRICULTURE

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Faculty

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Academic Programs	Credits
BS: Agriculture	40
BS: Animal Science	40
Emphasis Areas	
Pre-Veterinary Medicine	
Management	
Equine Science	40
BS: Horticulture	
Emphasis Areas	
Landscape Design	60
Landscape Management	
BT: Agribusiness	
Emphasis Areas	
Crop Production	60
Animal Science	
BT: Horticulture	
Emphasis Areas	36
Horticulture Crop Production	
Landscape Design	
Landscape Management	35
AT: Agriculture	
Emphasis Areas	
Crop Production	20
Dairy Herd Management	
AT: Horticulture	
Emphasis Areas	
Landscape Design	
Landscape Management	
Minors in Agriculture, Animal Science or Horticulture	
Pre-Professional Program in Veterinary Medicine	

Programs

Bachelor of Science. The BS degree prepares individuals to pursue advanced degrees for careers in teaching or research. Students may major in agriculture, animal science or horticulture with a minor to complement their intended purpose.

Bachelor of Technology. The BT degree is a career specialist's degree. Graduates are prepared for supervisory and management positions in production agriculture, horticulture, or the ornamental horticulture industry.

Associate of Technology. The two-year AT degree programs provide students with adequate skills and working knowledge to apply for entry-level positions in their area of specialization.

BS: Agriculture

Major requirements—40

AGRI118, 206, 300, 304, 308, 405; ANSI114; HORT105, plus 15 major elective credits chosen in consultation with advisor.

Cognate requirements—18

BIOL165,166; CHEM131, 132

BS: Animal Science

Major requirements—40

AGRI405; ANSI114, 305, 425, plus 19–21 credits in a special area of emphasis and 6–10 major electives chosen in consultation with an advisor.

Cognate requirements—18

BIOL165, 166; CHEM131, 132

Animal Science Emphases in BS Program

Students may choose an area of emphasis from the following or develop a personalized program in consultation with their advisor to meet specific career goals.

Pre-Veterinary Medicine—21

AGRI137(2); ANSI340 (1 species), ANSI379, 420, 435, 440 and 445
Recommended electives for entry into veterinary college:

- * BCHM421; CHEM231, 232; MATH166 & 167 or 168; PHYS141, 142.
- * Courses may vary depending on entrance requirements of the veterinary college of choice.

Management—19

AGRI137 (2), 395; ANSI340 (2 species); ACCT121; AGRI270. Major electives can be tailored to meet a specific student's interest.

Equine Science—21

ANSI340 (Equine Management), 440, 445, 450, 455, 460; AGRI137 (1–2), 395 (1–2)

BS: Horticulture

Major requirements—40

AGRI118, 240, 308, 405; HORT105, 378, plus 18 credits in a special area of emphasis and 2 credits major elective.

Cognate requirements—18

Select credits from BIOL165, 166; BOT208, 475; ZOOL459; CHEM131, 132; FDNT230/240.

Horticulture Emphases in BS Program

Students may choose an area of emphasis from the following or develop a personalized program in consultation with their advisor to meet specific career goals.

Landscape Design—18

Select from the following: HORT135, 226, 228, 315, 350, 365, 375, 429, 448

Landscape Management—18

Select from the following: HORT135, 208, 212, 226, 228, 315, 350, 360, 369

General Education Requirements for Agriculture BT

See professional program requirements, p. 39, and note the following **specific** requirements:

Religion: professional degree requirements

Language/Communication: professional degree requirements

History: professional degree requirements

Fine Arts/Humanities: professional degree requirements

Life/Physical Sciences: professional degree requirements

Mathematics: professional degree requirements

Computer Literacy: INFS120

Service: BHSC100. 40 hours of service or alternative field service for majors in: HORT365, ANSI425

Social Sciences: professional degree requirements

Fitness Education: professional degree requirements

BT: Agribusiness**Major requirements—44**

AGRI118, 270, 405, 395, ANSI114, HORT105 plus 7–10 major elective credits chosen in consultation with advisor

Cognate requirement—22

CHEM100 or 110, ACCT121, 122, BSAD341, 355, ECON226, FNCE317

Agribusiness Emphases in BT Degree Program

Students may choose an area of emphasis from the following or develop a personalized program in consultation with their advisor to meet specific goals.

Crop Production—34

AGRI206, 240, 308, HORT378, 208

Plus 18 credits chosen from the following: AGRI300, 304, 345, 390, HORT211, 226, 228, 360, 369

Animal Science—31

ANSI305, 340 (2 species), ANSI425, plus 19 major elective credits chosen in consultation with advisor.

BT: Horticulture**Major requirements—60**

AGRI118, 240, 308, 395, 405, HORT105, 150, 378, plus 4–10 major elective credits chosen in consultation with advisor.

Cognate requirement—4

CHEM100 or 110

Horticulture Emphases in BT Program

Students may choose an area of emphasis from the following or develop a personalized program in consultation with their advisor to meet specific career goals.

Landscape Design—30

HORT135, 226, 228, 315, 350, 365, 375, 429, 448. The landscape design program emphasizes the development of technical drawing skills, CAD application, an understanding of the principles of design and a knowledge of plants.

Landscape Management—14

HORT208, 211. Select 9 credits from the following: HORT212, 350, 359, 360, 375. The landscape management emphasis features proper horticultural practice, identification of landscape plants, selection of appropriate equipment, and the concept of total maintenance.

Horticultural Crop Production—24

Credits will be chosen in consultation with advisor from the following: AGRI206, 208, 300, 304, 345, 390, HORT211, 226, 228, 360, 369. The horticultural crop production emphasis prepares students for careers in the greenhouse/nursery industry or vegetable/fruit production industry.

AT: Agriculture**Major Requirements—25–36**

ANSI114, 305, 340, plus 15–24 credits in a special area of emphasis (see below) and 2–4 major elective credits chosen in consultation with advisor.

Agriculture Emphases in AT Program

Students may choose an area of emphasis from the following or develop a personalized program in consultation with their advisor to meet specific career goals.

Crop Production—24

AGRI118, 206, 240, 300, 395; HORT105

Cognate requirement—4

CHEM100 or 110

Dairy Herd Management—22

AGRI270, 304, 395; ANSI250, 278, 430

Cognate requirements—4

CHEM100 or 110

AT: Horticulture**Major requirements—35**

AGRI118, 395(3) 405; HORT105, plus 13 credits in a special area of emphasis (see below) and 11 major elective credits chosen in consultation with advisor.

Cognate requirement—4

CHEM100 or 110

Horticulture Emphases in AT Program

Students may choose an area of emphasis from the following or develop a personalized program in consultation with their advisor to meet specific career goals.

Landscape Design—13

HORT135, 226, 228, 350

Landscape Management—13

HORT208, 211, 226, 228

Minors in Agriculture, Animal Science or Horticulture—20

Selected from AGRI, ANSI or HORT courses in consultation with advisor.

Pre-Professional Program in Veterinary Medicine

Katherine Koudele, *Director*
269-471-6299

Entrance requirements vary among the colleges of veterinary medicine. Therefore, interested students must write to the

schools of choice for the most current and detailed information. A list of accredited colleges of veterinary medicine may be obtained from the American Veterinary Medical Association, 930 North Meacham Road, Schaumburg, IL 60196; www.avma.org.

Students in consultation with their advisors in the Agriculture Department can design individualized programs of study to meet the entrance requirements of the veterinary school of choice. The required prerequisite pre-veterinary courses are usually general biology, general and organic chemistry, physics, biochemistry, mathematics, courses in animal science, and general education.

Courses (Credits)

See inside front cover for symbol code.

Agriculture

AGRI118 \$ Alt (4)

Soil Science

Factors affecting soil formation, soil texture, particle size, pore space and their impact on soil air/water relations, and chemical characteristics of soils, including pH, ion exchange, and maintenance of soil fertility. Weekly: 3 lectures and a 3-hour lab.

AGRI137 (1-3)

Practicum in _____

Fifty hours per credit of supervised practical experience in one area of concentration. May be repeated in different areas for a maximum of 6 credits. Topics to be chosen in consultation with an advisor. *Fall, Spring*

AGRI206 \$ Alt (3)

Farm Machinery

Selection and operation of farm equipment, based on the initial cost and economic performance, including factors governing the site and type of farm machines, their capacity, efficient use, adjustment and repair. Weekly: 2 lectures and a 3-hour lab.

AGRI240 Alt (3)

Fundamentals of Irrigation

Design, installation, drawing, interpretation and maintenance of plastic or metal irrigation systems and control devices for proper sprinkler coverage. *Fall*

AGRI270 Alt (3)

Management of Agriculture Enterprises

An introduction to acquiring and analysis of management information for decision making; an understanding of basic economic principles that impact biological production systems and implementation of the principles for total quality management for increased productivity.

AGRI300 Alt (3)

Field Crop Production

Importance, distribution, economic adaptation, and botany of leading farm crops, emphasizing rotation, seedbed preparation, and economic production.

AGRI304 Alt (3)

Forage Crop Production

Basic principles of forage crop production, emphasizing choice of crop, establishment, growth, maintenance, harvesting, storage and feeding.

AGRI308 \$ Alt (3)

Principles of Weed Control

Control of weeds in horticultural and field crops, utilizing biological, cultural, mechanical, and chemical practices. Class study also involves preparation and testing for pesticide applicator's license. Weekly: 2 lectures and a 3-hour lab.

AGRI345 (1-4)

Topics in _____

A class based on selected topics of current interest in agriculture.

Repeatable in different areas including, but not limited to:

- Concepts of International Agriculture
- Mittleider Method
- Horse Judging
- Livestock Judging
- Viticulture
- Solanaceous and Vine Crops
- Tree Fruit Production
- Equine Dentistry
- Equine Hoof Care and Basic Shoeing
- Hippotherapy/Therapeutic Riding
- Riding Instruction—English
- Riding Instruction—Western
- Equine Massage Therapy

AGRI390 \$ (1-4)

Agriculture Study Tour

Agriculture study tours are designed to enhance and broaden the on-campus learning experience by visiting areas of horticultural and agricultural interest and their impact on the local culture and society. Students will be expected to conduct pre-tour research on a specific topic related to the purpose of the tour and a post-tour analysis and synopsis of the tour experience.

AGRI395 (1-6)

Internship in _____

Supervised internship of on-the-job work experience in some field of agriculture under the direction of the employer and evaluated by a departmental faculty member. Students submit a report of their experience and must complete a minimum of 120 hours of work experience for each credit earned. Repeatable up to 6 credits.

AGRI405 (1)

Research Seminar

Research work in agriculture and related fields; reports given by students, faculty, and visiting lecturers. *Spring*

AGRI499 (1-5)

Project in _____

Individual research in some field of agriculture under the direction of the faculty. Repeatable to 10 credits. Prerequisite: AGRI405 or permission of the instructor.

Animal Science

ANSI114 (3)

Introduction to Animal Science

Basic farm animal anatomy, reproductive and digestive physiology, housing, health management with information on how animal products are processed and marketed. Efficient, effective management is emphasized throughout course. *Fall*

ANSI150 \$ Alt (3)
Companion Animal Care
 Covered is how to choose the right pet for your life situation, how to travel with your pet on all kinds of transportation, how to keep your pet healthy, grooming, training and correcting behavioral problems. Animal species covered are dogs, cats, small caged pets/rodents, birds, fish, reptiles and amphibians.

ANSI250 \$ Alt (3)
Dairy Facilities
 A study of various types of milking systems, housing and manure handling systems of dairy cattle of all ages and production levels. Ventilation, stall and barn dimensions, and bedding will be some of the topics covered. Weekly: 2 lectures and one 3-hour laboratory.

ANSI278 \$ Alt (3)
Dairy Health and Disease
 A study of the cause, prevention and treatment of infectious and metabolic diseases of dairy cattle. Also included is dairy cattle breeding and genetics. Weekly: 2 lectures and one 3-hour laboratory.

ANSI305 Alt (3)
Animal Nutrition
 Principles of digestion, absorption, metabolism of feeds by farm species are examined for practical, profitable feeding. Common and non-traditional feedstuffs, feed-related diseases and ration formulation are included. Weekly: 3 lectures. Recommended: CHEM 100 or higher. *Fall*

ANSI325 \$ Alt (3)
Domestic Animal Behavior
 A study of the ways domestic animals communicate and interact with conspecific and other animals, and humans. Included are: physiological basis and development for each type of behavior; normal and aberrant behavior manifestations in each domestic animal species; treatments for problem situations; consideration of the effects of domestication on each species. Two lectures and one lab per week. *Fall*

ANSI340 \$ (3)
Production/Management of _____
 Production methods and management practices of domesticated livestock species including nutrition, reproduction, housing, health and specialized care of a particular species. Course is repeatable for study of avian, beef cattle, dairy cattle (includes a lab), equine (includes a lab), porcine, and wool and lamb production. *Fall, Spring*

ANSI379 Alt (3)
Small Animal Health and Disease
 A survey of proper handling and care, nutritional needs, and common health problems of companion animals such as dogs, cats, and birds. *Fall*

ANSI420 \$ Alt (4)
Canine Gross Anatomy
 Study of macroscopic skeleton, muscles, internal organs, blood vessels and nerves using preserved, latex-injected specimens. Comparisons made with the live dog through palpation. Weekly: 2 lectures and 2 three-hour labs. Recommended: BIOL166. *Fall*

ANSI425 Alt (3)
Issues in Animal Agriculture, Research and Medicine
 Study of the ethical issues that challenge animal researchers, producers, caretakers, and veterinarians to treat animals humanely yet effectively in society today. *Spring*

ANSI430 \$ Alt (3)
Lactation Physiology
 Anatomy and physiology of the udder, milk secretion, disease prevention and treatment, milking management and milking systems. Weekly: 2 lectures and 1 lab. *Spring*

ANSI435 Alt (3)
Animal Genetics
 A study of basic genetics, cytogenetics, immunogenetics, population genetics and quantitative genetics, biotechnology, gene mapping and the use of molecular tools to research inherited disorders. Included are descriptions of how veterinary genetics can be applied to artificial selection in animal production, information on the control of inherited disorders and the conservation of genetic diversity in both domesticated and wild animal species. *Spring*

ANSI440 \$ Alt (3)
Animal Reproduction
 Study of anatomy and physiology of farm animal reproduction, which explores the cellular component as well as the management aspects. Weekly: 2 lectures and a 3-hour lab. Recommended: BIOL166. *Spring*

ANSI445 \$ Alt (3)
Physiology of Farm Animals
 Physiology of digestive, reproductive, lactation, cardiovascular, pulmonary, excretory, nervous, and skeletomuscular systems in domesticated ruminants and monogastrics. Weekly: 2 lectures and a 3-hour lab. Recommended: BIOL166. *Fall*

ANSI450 Alt (3)
Equine Exercise Anatomy & Physiology
 The anatomy and physiology of the limbs (shoulder and pelvic girdles, legs, feet) as well as the respiratory tract, all of which are vital to a horse's usefulness.

ANSI455 Alt (3)
Equine Health and Disease
 Topics covered in depth are: the causes of infectious (e.g. tetanus, strangles) and non-infectious (e.g. laminitis, colic, injury), diseases of horses, their prevention, diagnosis and treatment.

ANSI460 \$ Alt (3)
Advanced Equine Management
 Covers horse behavior and safety, conformation and way-of-going analysis, stall and pasture management, tack selection and fitting (saddles, bridles, bits, harnesses), grooming, financial management and business planning. Weekly: 2 hours lecture and 3 hours lab.

Horticulture

HORT105 \$ (5)
Plant Science
 Introduces students to the requirements of plant growth and development. Understanding of these processes is gained by studying topics such as plant cells, tissue, and organ structure;

photosynthesis, cellular respiration, plant reproduction, including flowering, fruit development, seed set, the role of hormones, and plant nutrition. Weekly: 4 lectures and a 3-hour lab. *Fall*

HORT135 \$ (4)

Landscape Drafting and Design

Develops proficiency in technical drafting for landscape design including symbols, title blocks, plant legends and plan organization. Principles of design, site analysis, functional diagramming, circulation, spatial planes, design schematics and plant selection are explored. Laboratory puts the design process to work in drawing plans for residential design. Weekly: 3 lectures and a 3-hour lab. *Fall*

HORT150 (3)

Home Horticulture

An introduction to the horticultural and landscape field for majors and homeowners alike, this class offers basic care of the home landscape. Landscaping with ornamental trees and shrubs, perennials and annuals or growing fruits and vegetables for the garden are included. Become skilled at pruning and training plants, diagnosing and treating insect and disease problems, fertilizing techniques, and more. Course prepares you for home ownership and teaches life skills for creating a productive and beautiful home environment.

HORT208 \$ Alt (3)

Propagation of Horticultural Plants

Intended to acquaint students with the processes of asexual reproduction, especially as it applies to the horticultural industry. Asexual reproduction investigates methods of clonal reproduction utilizing non-flowering plant parts such as cutting, grafting, layering, and micropropagation (tissue culture). Weekly: 2 lectures and a 3-hour lab. Recommended: HORT105. *Spring*

HORT211 \$ Alt (2)

Landscape Equipment

Assessment of and exposure to current equipment needed to run a landscape installation and maintenance business. Experience in physical operation of equipment, preventative maintenance and minor repair is practiced. Weekly: 1-hour lecture and a 3-hour lab. *Fall*

HORT226 Alt (3)

Woody Plant Identification

Introduction to the identification and recognition of shape, size, color, texture, environmental requirements and landscape value of common deciduous and evergreen trees, shrubs and vines. *Fall*

HORT228 Alt (3)

Herbaceous Plant Identification

Identification and recognition of shape, size, color, texture, and environmental requirements of the nonwoody plants providing color and ground cover in the landscape. *Fall*

HORT310 (3)

Commercial Vegetable Production

Production and management of commercial vegetable crops; includes planting, cultural care, harvesting and post-harvesting procedures and marketing.

HORT315 \$ Alt (4)

Landscape Construction

Course combines both drawing and hands-on construction of

installing softscapes and hardscapes, plus understanding of the vast array of hardscape materials available in the form of pavements, edgings, fencing, retaining walls, decks, pools, shelters, etc. Weekly: 3 hours lecture and 3 hours lab. *Spring*

HORT350 Alt (3)

History of Landscape Design

A study of landscape history throughout civilization and its impact upon society and the environment. The origin of landscape architectural styles and their characteristics will be explored. An introspective look at landscape design personalities through the ages and their influence upon the American landscape. *Spring*

HORT360 \$ Alt (3)

Arboriculture

Care of shade and ornamental trees living under environmental stress of urbanization, their legal protection and value. Includes tree anatomy and physiology, soils, nutrition and water relationships, transplanting, disease and insect control, mechanical injury and pruning to develop a healthy tree. Weekly: 2 lectures and a 3-hour lab. *Fall*

HORT365 \$ Alt (3)

Urban Landscape Design

Designing landscapes to meet the environmental challenges and conditions of urban spaces. Circulation patterns for conducting business, aesthetic and functional aspects of design for corporate/ institutional, governmental agencies and municipal areas. Weekly: 2 lectures and a 3-hour lab. Recommended: HORT135. *Spring*

HORT369 \$ Alt (3)

Greenhouse Environment and Production

Concepts and principles of commercial plant production in the greenhouse environment. Topics include structure and environment of the greenhouse, production of bedding and potting plants and cut flowers. Weekly: 2 lectures and a 3-hour laboratory.

HORT375 Alt (3)

Landscape Estimating

An introduction to the estimating process for landscape design, construction and maintenance work. Various schedules and forms are used to assign costs of equipment, plants, hardscape materials, labor and overhead. The many variables from project to project are explored and then formulas are applied to arrive at making landscape installations an efficient and profitable business. *Spring*

HORT378 Alt (4)

Integrated Pest/Disease Management

Study of significant diseases and pests of agricultural and horticultural plant materials, including life cycles and influence of environmental conditions; determination of effective control methods for crop, ornamental and turfgrass production. *Spring*

HORT429 \$ Alt (3)

Computer Landscape Design

Principles and practices of computer-aided landscape design, including creating scale perimeter plot plans, using drawing tools, plant/site relationships, and graphic imaging leading to a computer-generated landscape drawing. Laboratory emphasizes skill development and proficiency in integrating software and

hardware to create CAD-generated landscape designs. Prior landscape drawing course work is recommended. *Spring*

HORT448

\$ Alt (4)

Advanced Landscape Design and Graphics

Landscape design concepts relating to the more challenging problems of residential design. Field application of grading relating to contours, specifications, exploring deck design, planting combinations, and exercises in graphics and rendering for presentations. Weekly: 3 lectures and a 3-hour lab.

Recommended: HORT135. *Spring*

DIGITAL MEDIA & PHOTOGRAPHY

Harrigan Hall 227
269-471-3450
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www.610g.blogspot.com

Art & Design and Digital Media & Photography Faculty

Rhonda G. Root, *Chair*
Stefanie Elkins
Steven L. Hansen
Brian Manley
Thomas J. Michaud
Diane J. Myers
Sharon J. Prest
David B. Sherwin
Douglas Taylor
Marc G. Ullom

Emeritus

Gregory J. Constantine (gregcons@andrews.edu)

Academic Programs	Credits
BFA in Visual Art	
Emphasis Areas	
Fine Art	75-78
Illustration	75-78
Pre-Art Therapy	75-78
BFA in Visual Communication	
Emphasis Areas	
Art Direction/Advertising	75-78
Graphic Design	75-78
Web Design	75-78
BFA in Photography	
Emphasis Areas	
Commercial Photography	75-78
Documentary Video	75-78
Fine Art Photography	75-78
Minor in Graphic Design	22
Minor in Visual Art	22
Minor in Digital Media	21
Minor in Photography	20
Minor in Web Design	24

Mission

We, the Andrews University Departments of Art & Design and Digital Media & Photography, mentor students to be Christ-centered, socially responsible creative individuals by developing their artistic gifts in a nurturing spiritual environment.

Department Goal

It is the goal of the Departments of Art & Design and Digital Media & Photography to help each student achieve the traditional and digital skills necessary to achieve entrance into a graduate program, begin work as a professional artist or craftsman or achieve a professional portfolio that will allow them to directly pursue a career in their chosen track after graduation. Through