AGRICULTURAL TECHNOLOGY

Our Website (http://www.cals.vt.edu)

Overview

The Agricultural Technology Program offers a concentrated academic experience for individuals pursuing an associate degree in preparation for careers in the agriculture and green industries. Students can specialize in Applied Agricultural Management or Landscape and Turfgrass Management.

Applied Agricultural Management (AAM)

- Animal Science
- Crop Science
- Agribusiness

The AAM specialty provides students with a balanced education – including courses in livestock production, crop production, and agribusiness – that prepares them for diverse job opportunities.

The animal science curriculum includes courses in genetics, nutrition, reproduction, health, and management. It focuses on the biological and economic aspects of animal production and management. Soils, forages, mechanics and chemical application courses round out the AAM curriculum.

Business courses provide instruction in financial recordkeeping, professional selling, personnel management, strategic marketing, whole business planning, and information systems, focusing on strategic management and economic issues of the agricultural industry. Laboratories stress the use of modern management methods and computer applications for problem solving.

The crop science curriculum provides students knowledge and hands-on experiences relative to Virginia's major crop and forage systems. Students learn about cash crop rotations and grazing management as well as precision agriculture, integrated pest management, pesticide application, and pesticide safety. Students gain experience using the latest technologies in precision agriculture through labs held in partnership with leaders from the farm equipment industry.

Landscape and Turf Management (LTM)

- Golf Course Management
- Landscape Management
- Sports Turf Management
- Horticulture Production

In the LTM specialty, students prepare for a career in the green industry — including landscape design, landscape contracting, golf course management, horticulture production and nursery management, and sports turf management. They learn about turfgrass and landscape installation, maintenance, and management.

The LTM curriculum focuses on developing well-rounded students who are in high demand by many branches of the green industry. Students learn about various types of plants, turfgrass management, soils and nutrient management, landscape design, and Irrigation and drainage.

Additional courses are offered in horticulture production, hardscaping, landscape contracting, golf and sports turf management, integrated pest management, and chemical application. Special study classes allow students to work on the Virginia Tech golf course and athletic fields and compete in national competitions. A strong core of business courses is also offered. Laboratories for each class focus on hands-on learning and expose students to a range of applied landscape and turf management skills.

Course Requirements for Major

Degree Requirements

The graduation requirements in effect at the time of graduation apply. When choosing the degree requirements information, always choose the year of your expected date of graduation. Requirements for graduation are referred to via university publications as "Checksheets". The number of credit hours required for degree completion varies among curricula. Students must satisfactorily complete all requirements and university obligations for degree completion.

The university reserves the right to modify requirements in a degree program. However, the university will not alter degree requirements less than two years from the expected graduation year unless there is a transition plan for students already in the degree program.

Please visit the University Registrar website at http://registrar.vt.edu/graduation-multi-brief/index1.html for degree requirements.

All students are required to complete an occupational internship for academic credit to provide practical experience in a work environment. The three-credit internship lasts for 10 weeks and 400 hours. The internship usually occurs during the summer between the first and second year of the program. Students, in consultation with faculty members, select their own internships that may be located anywhere in the United States or abroad.

All admission offers for this program are made though the Agricultural Technology Program. Foreign language is not a requirement of this program. Recommended high school courses include English, Algebra I and Geometry (minimum), a lab science, and a computer class. Students are encouraged to pursue an Advanced or Standard Diploma from high school. Agricultural Technology students have the same rights and privileges as other students at Virginia Tech, except for membership in the Corps of Cadets and participation in NCAA sports. Selected agricultural technology courses can be transferred to a bachelor's degree program in the College of Agriculture and Life Sciences at Virginia Tech.

Satisfactory Progress towards Degree

Students must achieve and maintain a cumulative 2.00 GPA each semester;

All AT courses will be used in the calculation of the GPA.

- Associate of Agriculture with Applied Agricultural Management Option (https://catalog.vt.edu/undergraduate/agriculture-life-sciences/agricultural-technology/associate-agriculture-applied-agricultural-management/)
- Associate of Agriculture with Landscape and Turf Management Option (https://catalog.vt.edu/undergraduate/agriculture-life-sciences/agricultural-technology/associate-agriculture-landscape-turf-management/)

Director: Susan Sumner
Senior Instructors[1]**:** R. Kohl and T. Martin
Advanced Instructor: W. Gwaltney
Instructor: R. Jeter, J. Dickerson, and M. Holder

Assistant Program Directors: T. Martin and R. Kohl

[1] In addition, selected faculty members from departments within the College of Agriculture and Life Sciences teach courses in the program.

Undergraduate Course Descriptions (AT)

AT 0104 - Computer Applications (3 credits)
Provides a basic understanding of the operation and use of the micro-computer for farm/firm business management. Stresses the practical applications of Microsoft Office (word processing, spreadsheets, and database management systems, PowerPoint, and Outlook), Adobe Acrobat including PDF Annotator, and OneNote to agricultural production and financial management decisions.

AT 0114 - Applied Ag Math (3 credits)
This course will provide students with a background in the mathematical methods and operations used to solve numerical problems arising in soils, dairy, horticulture, landscape, poultry, turf, crops, livestock and feeds. Students will become acquainted with terminology and equations unique to agricultural businesses and enterprises. Emphasis is placed on solving word problems.

AT 0124 - Ag Mach Mech (3 credits)
Introduction to the operation and maintenance of internal combustion engines, field machinery, tractor and power units, and shop to include the fundamentals of gas and arc welding.

AT 0144 - Communication Skills (4 credits)
Written and oral communication skills, including business and technical writing, public speaking, and interpersonal communication. Instruction and practice in the application of communication skills for business and agriculture. Emphasis on effective use of word processing and email software.

AT 0164 - Introduction to Animal Science (4 credits)
Study of animal products, production methods, and management systems for beef, sheep, horses, dairy, swine and poultry. Classroom instruction, demonstrations, and hands-on experience with livestock and poultry.

AT 0174 - Fundamentals of Turfgrass Mgmt (4 credits)
Turfgrass identification, morphology, adaptations, and management systems for parks, lawns, athletic fields, roadsides, and golf courses. Mowing, irrigation, fertilization, soil management, pest management, and other practices that impact turf management. Turfgrass management planning utilizing Integrated Pest Management and Best Management Practices.

AT 0184 - Intro Plant Biology and Chem (3 credits)
Basic botanical and chemical principles and their applications to sound plant production and management practices. Emphasis on practical experiences in laboratory and field settings.

AT 0194 - AT Internship (1-6 credits)
Practical experience in a selected agricultural enterprise, under the direct supervision of owner, manager, or supervisor. Internship will be evaluated by faculty member. Written reports of work experience activities are required. Completion of at least 28 credits with a minimum GPA of 2.00 required.

AT 0224 - Personnel Management (2 credits)
Principles and practices in the recruitment, selection, and compensation of employees. Emphasis on employer/employee relationships, including incentive programs. Impacts of safety and environmental concerns on the health and well-being of agricultural employees.

AT 0234 - Intro Agribus & Financial Mgt (3 credits)
Functions of agribusiness enterprises within the U.S. economic framework. Economic systems, cooperatives, essential elements of business organization, management tools for decision-making, creating financial statements, business planning, development and analysis of budgets, investing in a business, and time value of money.

AT 0254 - Animal Structures/Environments (3 credits)
Functional considerations in facilities development for production agriculture. Concepts of farmstead planning and system development emphasized. Techniques for providing production animal environment, especially for confinement facilities.
Prerequisite(s): AT 0114

AT 0274 - Agribus Marktng & Entrepreneur (3 credits)
Principles of marketing through the agribusiness industry including the strategic management of products, distribution, promotion, and pricing to improve business performance. Entrepreneurship is explored as a career alternative including methods for acquiring necessary start-up capital. Solving business problems utilizing finance and marketing tools.
Prerequisite(s): AT 0234

AT 0284 - Prof Selling for Agribusiness (2 credits)
Fundamentals of professional selling in the agricultural environment. Preparing and making sales presentations for an agricultural product. Safety and environmental concerns associated with the purchase and/or use of an agricultural product or service.

AT 0294 - Livestock Merchandising (2 credits)
A comprehensive study of the principles and activities involved in successfully promoting and merchandising livestock. A livestock auction will be held at the conclusion of the course to provide experiences in advertising, salesmanship, facility development, sale management, and budgeting. Pre: Second year student.

AT 0304 - Animal Products (2 credits)
Principles and applications of the evaluation and utilization of animal products of beef, pork, lamb, poultry and dairy origin with emphasis on the conversion of live animals to retail cuts and processed meats and milk into dairy products.

AT 0324 - Livestock Reproduction (2 credits)
Principles and practices of reproductive management used to maximize reproductive efficiency in dairy and beef cattle, sheep, swine, and horses. Must be second year student in Agriculture Technology.
Prerequisite(s): AT 0164

AT 0334 - Principles of Animal Health (3 credits)
A general introduction to animal health principles of farm animal species, intended to provide an understanding of the fundamentals of disease processes and animal healthcare. The emphasis is on disease prevention and control rather than on the treatment of disease. Must be second year student in Agriculture Technology.

AT 0344 - Grain Crop Management (4 credits)
Principles and practices of efficient grain crop management with an emphasis on Virginia cropping systems.
Prerequisite(s): AT 0184 and AT 0414

AT 0354 - Feeds and Feeding (2 credits)
Principles and practices of livestock feeding. Anatomy and physiology of ruminant and non-ruminant digestive systems. Emphasis on nutrient requirements and ration formulation. Computerized ration formulation and evaluation.

AT 0364 - Ath Fld Prac- Football/Soccer (2 credits)
Learn the principles and techniques of game preparation and routine maintenance on the NCAA football and soccer fields at Virginia Tech. Students laboratory experience will be field work with the Virginia Tech Athletic Department staff. Focusing the football and soccer fields during the NCAA competition season.

AT 0374 - Ath Fld Prac- Base/Softball (2 credits)
Learning the principles and techniques of game preparation and routine maintenance on the NCAA baseball and softball fields at Virginia Tech. Students laboratory experience will be field work with the Virginia Tech Athletic Department Staff. Focusing on the baseball and softball fields during the NCAA competition season.

AT 0394 - Golf Course Practicum (2 credits)
Principles and techniques of golf course preparation and maintenance required for a high-end golf course. Off-site fieldwork, laboratory experience. Practice maintenance procedures needed to rejuvenate the golf course from the summer season.
Prerequisite(s): AT 0174

AT 0404 - Irrigation and Drainage (3 credits)
Principles applied to solving irrigation and drainage problems. Emphasis placed on hydraulics, irrigation design, irrigation scheduling, and components including heads, valves, controllers, backflow prevention, wire, pipe, and fittings.
Corequisite(s): AT 0114

AT 0414 - Soils and Nutrient Management (3 credits)
Physical, chemical, and biological properties of soils; soils suitability for production of a range of agricultural crops to include turfgrass and landscape plants. Properties of common liming, biosolid, manure, and fertilizer materials with emphasis on their environmental impacts. Soil and plant sampling procedures and the analysis of soil tests. Nutrient management plans.

AT 0424 - Nutrient Management Planning (3 credits)
Basic soil science and fertility principles necessary for crop production. Environmental impacts of phosphorus and nitrogen, environmentally sensitive site considerations, regulations, and how to write a nutrient management plan.
Prerequisite(s): AT 0114 and AT 0184 and AT 0414

AT 0434 - Pest Management (4 credits)
Identification, classification, and life cycles of economically important insects, plant pathogens, and weeds. Pest management methods: cultural practices, chemical control, biological control, host plant resistance, etc.

AT 0444 - CAD for Landscaping (2 credits)
In-depth study and hands-on experience essential to landscape horticulture graphics in a digital format using industry appropriate software.
Prerequisite(s): AT 0684

AT 0464 - Forages and Forage Animal Sys (4 credits)
use of cool-season and warm-season forage species currently grown in Virginia in forage-based animal systems.
Prerequisite(s): AT 0184 and AT 0414

AT 0484 - Precision Ag and Data Mgmt (2 credits)
Introduction to various tools and applications related to precision agriculture. Collection, analysis, and effective interpretation and utilization of precision agriculture data, including soil test data, precision fertilizer, and pesticide data.
Prerequisite(s): AT 0184 and AT 0344

AT 0494 - Dairy Management (3 credits)
Concepts of efficient and profitable management of modern dairy herds. Application of basic principles of business, milking, mastitis control, milk quality, herd replacements, feeding, breeding, reproduction, herd health, housing, and milk marketing management to profitable dairy farming.
Prerequisite(s): AT 0164

AT 0504 - Agricultural Technology Survey (1 credit)
Orientation to the Agricultural Technology program and resources available at Virginia Tech. Introduction to state, national, and international agriculture; internship requirements; and opportunities and careers in agriculture.

AT 0514 - Cont Ag Issues (3 credits)
A survey course designed to acquaint the student with the concerns and critical issues impacting the field of agriculture. Contemporary agricultural issues will be explored.

AT 0524 - Whole Farm Planning (2 credits)
Principles of whole farm and agricultural business planning including creating business plans, personal financial plans, and farm/business transition plans. Identifying and solving real-world agribusiness problems utilizing proper planning.
Prerequisite(s): AT 0234

AT 0544 - Horticulture Production (3 credits)
Production of vegetable, fruit, flowering, and nursery crops, including propagation of these crops. Focus is on the culture of these commodities as alternative agricultural crops, including environmental and cultural requirements for high quality production.

AT 0554 - Chemical Application (2 credits)
Proper application of pesticides and other agricultural chemicals used in landscape and turf management and in production agriculture; including application methods, equipment calibration and configuration, occupational health and safety, and pesticide laws and regulations.

AT 0564 - Herbaceous Plants (2 credits)
Identification, selection, requirements, and uses of herbaceous plant materials commonly found in landscapes; includes annuals, perennials, bulbs, and grasses.

AT 0574 - Woody Landscape Plants (2 credits)
Identification and uses of evergreen and deciduous woody plant materials common in the landscape industry; including trees, shrubs, and ground covers; proper plant selection and location in the landscape site.

AT 0614 - Beef and Sheep Management (3 credits)
Beef cattle/sheep production and management. Emphasis on genetics, nutrition, herd health, reproduction, and marketing to optimize performance and profit. Management and flock decisions based on economic and business principles. Practical experience enhanced through laboratory activities.
Prerequisite(s): AT 0164

AT 0624 - Horse Management (3 credits)
Horse production and management. Emphasis on genetics, nutrition, herd health, reproduction, and marketing to optimize performance and profit. Management decisions based on economic and business principles. Practical experience enhanced through laboratory activities.
Prerequisite(s): AT 0164

AT 0654 - Golf Course Design and Rules (2 credits)
Principles of golf course design and rules of the game, including: evolution, fairness, progression, hazards, shot value, and safety. The United States Golf Associations rules of golf will be covered.

AT 0664 - Golf & Sports Turf Management (3 credits)
Management of turfgrass on modified soil. Advanced management techniques and manipulation of nutrition and cultural practices to reduce plant stress or increase plant tolerance. Intensive turfgrass pest identification, life cycles, environmental conditions, and methods of effective control. Integrated pest management and best management practices.
Prerequisite(s): AT 0174

AT 0674 - Spanish for the Green Industry (3 credits)
Dialogue-based language skills focused on vocabulary and grammatical structures common to agricultural and green industries. Includes vocabulary and contexts specific to activities in greenhouse, nursery, turf, and landscape environments. Elements of Spanish culture are included throughout the course. Pre: Prior study in Spanish is helpful but not required.

AT 0684 - Landscape Design (3 credits)
Principles and practices involved in the development and interpretation of landscape designs; proper selection and use of landscape construction materials and methods of construction. Introduction to utilizing computer-aided drafting.
Prerequisite(s): AT 0564
Corequisite(s): AT 0574

AT 0694 - Landscape Contracting (3 credits)
Interpreting a landscape design and properly installing plant materials. Preparing bids for customers using cost accounting principles. Maintaining and renovating landscapes as well as exploring careers and business opportunities in the landscaping industry.
Prerequisite(s): AT 0564 and AT 0574

AT 0704 - Turfgrass Capstone Project (3 credits)
Capstone course for the Landscape Turfgrass Management option of the Agricultural Technology program. Problem based learning course to evaluate selected turfgrass problems for stakeholders such as golf courses, athletic fields and parks and recreation departments facility administrators. Students to look holistically at a problem and use critical thinking, experiences and knowledge from previous class work to create custom solutions. For second-year students only.
Prerequisite(s): AT 0664

AT 0714 - Hardscape Materials & Instal (2 credits)
Non-plant portions of landscape construction such as rock walls, paver floors, arbors, and water gardens. The course covers the materials, construction. Restricted to students in the Landscape & Turf Management option in the Agricultural Technology Program.

AT 0724 - Landscape Skills Practicum (1 credit)
This course provide an introduction to a multitude of skills that are important for success in the landscape industry. Each session is set in a competitive environment emphasizing the development of a selection of hands-on skills, including safe equipment operation, landscape and hardscape installation, management and estimating techniques, and arboculture methods.

AT 0734 - Risk Management in Agriculture (2 credits)
Fundamentals of managing risk in agriculture, particularly for production of row crops and livestock, including sources of risk and cost/benefit analysis of various risk mitigation strategies. Commodity futures contracts and options as price risk management tools. Government policies, particularly crop and livestock insurance provisions of the current Farm Bill.
Corequisite(s): AT 0234

AT 0904H - Honors Seminar in Agricultural Technology (1 credit)
Exploration of topics in agriculture and related fields that impact and effective and efficient agricultural industry, including professional leadership skills. Special attention will be given to the collaboration and interdependency that the field of agriculture has with other segments of society, including social, political, and economics areas. May be repeated for a maximum of 3 credits and with different topics.

AT 0974 - Independent Study (1-19 credits)

AT 0984 - Special Study (1-19 credits)