AGRICULTURAL SCIENCE AND TECHNOLOGY MAJOR

College of Agriculture and Natural Resources
2139 Plant Sciences Building
301-405-4359
dcortez@umd.edu
www.psla.umd.edu (http://www.psla.umd.edu)

Agricultural Science and Technology is an interdisciplinary major focusing on sustainable production of food, feed, fiber, fuel, and ornamentals as well as developing skills to provide agricultural education for all. This major is a science based curriculum that allows students to obtain technological skills while developing critical thinking in a broad area of agricultural studies. Within this major there are three specializations to choose from: Agronomy, Environmental Horticulture, or Agricultural and Extension Education.

Agronomy

Agronomy students will focus on a broad range of agricultural disciplines providing them with a comprehensive education in crop, soil and animal sciences. Students will take courses in animal science, crop science, soil science, agricultural economics and plant protection. This specialization has electives that allows students to design their curriculum and develop knowledge in areas that meet their future goals. Graduates will be prepared to work in the agricultural industry in agricultural extension, management, marketing, regulatory, support services, as well as other opportunities.

Environmental Horticulture

The Environmental Horticulture specialization focuses on the science, technology and management of fruit, vegetable, flower and woody ornamental plant production. The applied aspects of the curriculum include training in plant propagation, greenhouse crop production systems, containerized nursery production, food crop production and controlled environmental systems. Courses are taken in plant science, soil science, plant protection and food safety practices. Graduates of this program pursue careers in urban agriculture, horticultural enterprises and public education programs. Students can prepare for plant science graduate programs by taking additional courses.

Agricultural and Extension Education

The Agricultural and Extension Education specialization provides students with varying coursework in:

- agribusiness & communications;
- animal, food & plant sciences;
- biotechnology;
- environmental & natural resources;
- leadership, youth & career development;
- power, structural & technical systems;
- and foundational pedagogical education courses.

The Agricultural and Extension Education specialization provides students with varying coursework in agribusiness & communications; animal, food & plant sciences; biotechnology; environmental & natural resources; leadership, youth & career development; power, structural & technical systems; and foundational pedagogical education courses.

Students practice agricultural literacy techniques throughout their individualized learning experiences to develop mastery in educating using agricultural concepts with diverse audiences. Inclusion within the Terrapin Teachers program provides cross-disciplinary and interdisciplinary opportunities for learning with peers. Graduates focused on formal education may become certified secondary high school agricultural teachers in public or private schools or specialize in an area for career technical education. Those focused as agricultural advocates may seek non-formal education jobs in non-profit agricultural literacy based foundations, become Extension youth educators, Extension agricultural specialists, or work within agricultural industry public relations areas. Proximity to federal agencies provides students with an opportunity to expand their international and regulation agency networking skills.

Undergraduates have two options. First option is to complete a double major in 4 years:

1. The first option is to complete a double major in 4 years: (1) Agricultural Science and Technology, Agricultural and Extension Education specialization and (2) Secondary Sciences Education.

2. The second option is to major in Agricultural Science and Technology, Agricultural and Extension Education specialization with no teacher certification and focus on Extension/Industry internships. Students wanting to complete a master's degree can enroll in the 5-year Integrated Master's with certification program. These students are able to complete additional agricultural content courses due to the majority of their educational courses being completed in the 30 credit master's program.

Program Learning Outcomes

1. Students will develop technical and knowledge-based skills in the required areas of study.
2. Students will use technical and basic learned knowledge to collaborate, solve problems, and then articulate conclusions.
3. Students shall develop effective communication skills and demonstrate the ability to present ideas with clarity to an appropriate audience.
4. Students will connect and build relationships with external groups in the appropriate fields of study.

Requirements

Course	Title	Credits
Major Core Courses		
ANSC101	Principles of Animal Science	3
ANSC103	Principles of Animal Science Laboratory	1
BSCI337	Biology of Insects	4
or BSCI497	Insect Pests of Ornamentals and Turf	
AREC250	Elements of Agricultural and Resource Economics	3
or AREC306	Farm Management and Sustainable Food Production	
CHEM131 & CHEM132	Chemistry I - Fundamentals of General Chemistry and General Chemistry I Laboratory	4
ENST200	Fundamentals of Soil Science	4
MATH113	College Algebra and Trigonometry	3
PLSC201	Plant Structure and Function	4
INAG250	Fundamentals of Agricultural Mechanics	3
Select one of the following:		3-4
PLSC275	Fundamentals of Agricultural Chemistry	

CHEM231 & CHEM232	Organic Chemistry I and Organic Chemistry Laboratory I	
PLSC420	Principles of Plant Pathology	4
PLSC453	Weed Science	3
Specialization Requirements		**38-71**
Select one of the following specializations:		
Agronomy		
Environmental Horticulture		
Agricultural and Extension Education		
Total Credits		77-111

Specializations: Agronomy

Course	Title	Credits
Agronomy Specialization Requirements		
Accounting, Education, Computer Science or Policy	Restricted Elective	3
ANSC	Elective	3
ANSC220	Livestock Management	3
ANSC/PLSC/ LARC	Elective	3
AREC	Restricted Elective	3
BSCI160 & BSCI161	Principles of Ecology and Evolution and Principles of Ecology and Evolution Lab	4
ENST	Restricted Elective	3
PLSC101	Introductory Crop Science	4
PLSC	Restricted Elective	3
PLSC389	Internship	3
PLSC460	Application of Knowledge in Plant Sciences	3
Total Credits		35

Environmental Horticulture

Course	Title	Credits
Environmental Horticulture Specialization		
BSCI170 & BSCI171	Principles of Molecular & Cellular Biology and Principles of Molecular & Cellular Biology Laboratory	4
AREC	Restricted Elective	3
Select one of the following:		3-4
ENST411	Principles of Soil Fertility	
PLSC461	Cultural Management of Nursery and Greenhouse Systems: Substrates	
PLSC462	Cultural Management of Nursery and Greenhouse Systems; Irrigation	
PLSC464	Cultural Management of Nursery and Greenhouse Systems: Nutrients	
PLSC203	Plants, Genes and Biotechnology	3
PLSC100	Introduction to Horticulture	4
PLSC271	Plant Propagation	3
PLSC303	Global Food Systems	3
PLSC389	Internship	3
PLSC400	Plant Physiology	4
PLSC432	Greenhouse Crop Production	3
PLSC433	Technology of Fruit and Vegetable Production	4
PLSC460	Application of Knowledge in Plant Sciences	3
Total Credits		40-41

Agricultural and Extension Education: Teaching Certificate

Course	Title	Credits
PLSC100	Introduction to Horticulture	4
or PLSC101	Introductory Crop Science	
BSCI160 & BSCI161	Principles of Ecology and Evolution and Principles of Ecology and Evolution Lab	4
One of the following courses:		3
ANSC220	Livestock Management	
ANSC242	Dairy Cattle Management	
ANSC232	Horse Management	
ANSC255	Introduction to Aquaculture	
ANSC227	Eating with Eyes Wide Open	3
AGST442	(Developing Leadership in Youth and Volunteers)	3
PLSC235	Irrigation and Drainage	3
or INAG235	Irrigation and Drainage	
AGST440	(Exploring Maryland Agriculture, Agricultural Industries & Agricultural Literacy)	3
PLSC471	Forest Ecology (or elective focused on Renewable Energy)	3
NFSC112	Food: Science and Technology	3
or PLSC115	How Safe is Your Salad? The Microbiological Safety of Fresh produce	
EDHD426	Cognitive and Motivational Literacy Content	3
TLPL101	Inquiry Approach to Teaching STEM (Step 1)	1
TLPL102	Inquiry Teaching of STEM in Middle School	2
BSCI348	Special Topics in Cell Biology and Molecular Genetics (BSCI348T: Research Methods for Terrapin Teachers)	3
One of the following courses:		3
TLPL488	Special Topics in Education (TLPL488P: Project Based Instruction)	
TLPL401	Student-Centered Curriculum and Instruction	
TLPL414	Knowing and Learning in Mathematics and Science	3
TLPL415	Perspectives in Science	3
TLPL425	Learning and Teaching in Science	3
TLPL478	Professional Seminar in Education (TLPL478F: Professional Seminar in Education: Agriculture)	2
TLPL479	Field Experiences in Education (TLPL479F: Field Experience in Science Education)	1
TLPL489	Internship in Education (TLPL489F)	12
TLPL481	Embracing Diversity in the Classroom Community	3
Total Credits		68

Agricultural and Extension education: Extension/Industry

Course	Title	Credits
PLSC100	Introduction to Horticulture	4
or PLSC101	Introductory Crop Science	
BSCI160 & BSCI161	Principles of Ecology and Evolution and Principles of Ecology and Evolution Lab	4
One of the following courses:		3
ANSC220	Livestock Management	
ANSC242	Dairy Cattle Management	
ANSC232	Horse Management	
ANSC255	Introduction to Aquaculture	3
ANSC227	Eating with Eyes Wide Open	3
AGST442	(Developing Leadership in Youth and Volunteers)	3
PLSC235	Irrigation and Drainage	3
or INAG235	Irrigation and Drainage	
AREC/PLSC/ LARC	Restricted Elective	6
AGST440	(Exploring Maryland Agriculture, Agricultural Industries & Agricultural Literacy)	3
PLSC471	Forest Ecology (or elective focused on Renewable Energy)	3
NFSC112	Food: Science and Technology	3
or PLSC115	How Safe is Your Salad? The Microbiological Safety of Fresh produce	
BSCI121	Beekeeping	2
INAG252	Agricultural Public Relations	3
AGST489	(Internship or Elective Course) [1]	3
AGST489	(Internship) [1]	3
TLPL101	Inquiry Approach to Teaching STEM (Step 1)	1
TLPL102	Inquiry Teaching of STEM in Middle School	2
One of the following courses:		3
TLPL488	Special Topics in Education (TLPL488P. Project Based Instruction)	
TLPL401	Student-Centered Curriculum and Instruction	
TLPL414	Knowing and Learning in Mathematics and Science	3
Total Credits		58

[1] Internship requirement: Students will either do two internships for a total of 6 credits or one internship for 3 credits and take a different elective course for 3 credits.

Four Year Plan

Click here (http://www.gened.umd.edu/for-students/forstudents-4yearplans-agnr.html) for roadmaps for four-year plans in the College of Agricultural and Natural Resources.

Additional information on developing a four-year academic plan can be found on the following pages:

- 4yearplans.umd.edu (http://4yearplans.umd.edu)
- the Student Academic Success-Degree Completion Policy (https://academiccatalog.umd.edu/undergraduate/registration-academic-requirements-regulations/academic-advising/) section of this catalog

Opportunities Undergraduate Research Experiences

Students are encouraged to take part in faculty mentored research. Please contact an advisor for more information.

Internships

Internships are a part of the required curriculum and can be in private or government sector employment. Formal (K-12 schools) and non-formal (non-profits, industry & Extension) education settings are available for students in the Agricultural & Extension Education specialization.

Student Clubs and Professional Organizations

Faculty in the department advise student clubs. The department also sponsors student teams that participate in regional and national contests. These teams participate in competitions in the following areas: turf and crop science.

Scholarships and Financial Assistance

Several scholarships and awards are available to AGST students. Contact the Associate Dean's office at 301-405-2078 for additional information. The Department also maintains a listing of scholarships. For more information regarding these scholarships contact the Chair's office in 2104A Plant Sciences, 301-405-4356.

The Office of Student Financial Aid (OSFA) administers all types of federal, state and institutional financial assistance programs and, in cooperation with other university offices, participates in the awarding of scholarships to deserving students. For information, visit: www.financialaid.umd.edu (http://www.financialaid.umd.edu).

Advising

The department has mandatory faculty advising for each of its major and minor programs. Students are required to meet with their faculty advisor at least twice a year.

For additional information please see:

Dr. Bill Phillips (https://agnr.umd.edu/about/directory/bill-phillips/), Director and Assistant Clinical Professor, Agronomy Advisor
email: billii@umd.edu | room: PLS 2131 | phone: 301.405.1061

Dr. Diana Cochran (https://agnr.umd.edu/about/directory/diana-renae-cochran/), Assistant Clinical Professor, Environmental Horticulture Advisor
email: cochrand@umd.edu | room: PLS 2133 | Phone: 301.405.4336

Dr. Melissa Leiden Welsh (https://agnr.umd.edu/about/directory/melissa-welsh/), Assistant Clinical Professor, Agricultural and Extension Education Advisor
email: drmwelsh@umd.edu | room: PLS 2130 | Phone: 301.405.6969

Diana Cortez (https://agnr.umd.edu/about/directory/dora-diana-cortez/), Academic Advisor & Lecturer

email: dcortez@umd.edu | room: 2139 Plant Sciences Building | Phone: 301.405.4359