

# Agricultural Education (BS): Agricultural Engineering Technology Concentration

To see more about what you will learn in this program, visit the Learning Outcomes website (<https://apps.oirp.ncsu.edu/pgas/>)!

The Agricultural Education major within the Department of Agricultural and Human Sciences prepares graduates to teach agriculture, serve as FFA advisors, and supervise agricultural experiences (SAE) in public and private schools.

The Agricultural Engineering Technology concentration is one of seven concentrations offered for the Bachelor of Science in Agricultural Education.

- Students interested in Agricultural Education may be eligible to apply for the North Carolina Teaching Fellows Program at NC State.
- Student teachers of agriculture may apply for Ed Scholars through NC State.
- Many alumni pursue careers in middle and high schools, universities and community colleges, county extension offices, and in the agricultural industry

## Teacher Licensure

Completion of the BS program in Agricultural Education leads to teacher licensure in North Carolina for grades 6 - 12. Because of North Carolina's reciprocity agreements, graduates also can pursue certification in about 35+ states. Download the Teacher Licensure Checklist (<https://cals.ncsu.edu/agricultural-and-human-sciences/wp-content/uploads/sites/13/2017/06/Teacher-Licensure-Checklist.pdf>) to review the requirements for admissions to teacher education candidacy and help you stay on course.

For more information about this program, including contact information, visit our website (<https://cals.ncsu.edu/agricultural-and-human-sciences/undergraduate/#agricultural-education-major>).

### Dr. Travis Park

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## Plan Requirements

Code	Title	Hours	Counts towards
<b>Orientation</b>			
AEE 103	Fundamentals of Agricultural and Extension Education	1	
or ALS 103	Freshman Transitions and Diversity in Agriculture & Life Sciences		
or ALS 303	Transfer Transitions and Diversity in Agriculture & Life Sciences		

### Communication

COM 110	Public Speaking	3
<b>Sciences</b>		
BIO 181	Introductory Biology: Ecology, Evolution, and Biodiversity	4
CH 101 & CH 102	Chemistry - A Molecular Science and General Chemistry Laboratory	4
MA 107 or MA 111	Precalculus I Precalculus Algebra and Trigonometry	3
Select one of the following Physics I courses:		4
PY 201	University Physics I	
PY 205 & PY 206	Physics for Engineers and Scientists I and Physics for Engineers and Scientists I Laboratory	
PY 211	College Physics I	
<b>Agricultural Education</b>		
AEE 101	Introduction to Career and Technical Education <sup>1</sup>	1
AEE 206	Introduction to Teaching Agriculture <sup>1</sup>	3
AEE 226	Computer Applications and Information Technology in Agricultural & Extension Ed <sup>1</sup>	3
AEE 303	Administration and Supervision of Student Organizations <sup>1</sup>	3
AEE 322	Experiential Learning in Agriculture <sup>1</sup>	3
AEE 326	Teaching Diverse Learners in AED <sup>1</sup>	3
AEE 327	Conducting Summer Programs in Agricultural Education	1

AEE 424	Planning Agricultural Educational Programs <sup>1</sup>	3
AEE 426	Methods of Teaching Agriculture <sup>1</sup>	3
AEE 427	Student Teaching in Agriculture <sup>1</sup>	8
AEE 491	Seminar in Agricultural Education	1

**Teaching Content Courses**

Plant Science Elective (p. 3)		3
ANS 150 & ANS 151	Introduction to Animal Science and Introduction to Animal Science Lab	4
SSC 200 & SSC 201	Soil Science and Soil Science Laboratory	4
Select one of the following Economics courses:		3
ARE 201	Introduction to Agricultural & Resource Economics	
ARE 201A	Introduction to Agricultural & Resource Economics	
EC 201	Principles of Microeconomics	
EC 205	Fundamentals of Economics	

**Professional Education**

ELP 344	School and Society <sup>1</sup>	3
EDP 304	Educational Psychology <sup>1</sup>	3
ED 311	Classroom Assessment Principles and Practices <sup>1</sup>	2
ED 312	Classroom Assessment Principles and Practices Professional Learning Lab <sup>1</sup>	1

**Agricultural Engineering Technology Concentration Electives**

BAET 201	Shop Processes and Management	3
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BAET 411	Agricultural Machinery and Power Units	4
BAE 325	Introductory Geomatics	3
BAET 332	Management of Animal Environments	4
BAET 343	Agricultural Electrification	4
BAET 432	Agricultural and Environmental Safety and Health	3
Agricultural Elective (p. 7)		2
<b>GEP Courses</b>		
ENG 101	Academic Writing and Research <sup>1</sup>	4
GEP Humanities ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/</a> )		6
GEP Mathematical Sciences ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-mathematical-sciences/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-mathematical-sciences/</a> )		3
GEP Health and Exercise Studies ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/</a> )		2
GEP US Diversity, Equity, and Inclusion ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-usdei/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-usdei/</a> )		3
GEP Interdisciplinary Perspectives ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-interdisciplinary-perspectives/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-interdisciplinary-perspectives/</a> )		5
GEP Global Knowledge ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-global-knowledge/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-global-knowledge/</a> ) (verify requirement)		
Foreign Language Proficiency ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/foreign-language-proficiency/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/foreign-language-proficiency/</a> ) (verify requirement)		
<b>Total Hours</b>		<b>120</b>

<sup>1</sup> A grade of C- or higher is required.

### Plant Science Electives

Code	Title	Hours	Counts towards
AEC 423	Introduction to Fisheries Sciences Laboratory	1	
ALS 103	Freshman Transitions and Diversity in Agriculture & Life Sciences	1	
ALS 303	Transfer Transitions and Diversity in Agriculture & Life Sciences	1	
ANS 215	Agricultural Genetics	3	
CS 200	Introduction to Turfgrass Management	4	
CS 210	Lawns and Sports Turf	3	
CS 211	Plant Genetics	3	
CS 213	Crop Science	3	
CS 214	Crop Science Laboratory	1	
CS 216	Southern Row Crop Production - Cotton, Peanuts, and Tobacco	3	
CS 218	Southern Row Crop Production - Corn, Small Grains and Soybeans	3	
CS 224	Seeds, Biotechnology and Societies	3	
CS 230	Introduction to Agroecology	3	
CS 312		3	
CS 400	Turf Cultural Systems	3	
CS 410	Community Food Systems	3	
CS 411	Crop Ecology	3	
CS 413	Plant Breeding	2	
CS 414	Weed Science	4	
CS 415	Integrated Pest Management	3	
CS 418	Introduction to Regulatory Science in Agriculture	3	
CS 424	Seed Physiology	3	

CS 430	Advanced Agroecology	4
CS 465	Turf Management Systems and Environmental Quality	3
CS 470	Advanced Turfgrass Pest Management	2
CS 480	Sustainable Food Production (capstone)	1
CS 502	Plant Disease: Methods & Diagnosis	2
CS 518	Introduction to Regulatory Science in Agriculture	3
CS 524	Seed Physiology	3
CS 541	Plant Breeding Methods	3
CS 565	Turf Management Systems and Environmental Quality	3
CS 590	Special Topics	1-6
CS 591		1-6
CSSC 290	Professional Development in Crop & Soil Sciences	1
CSSC 490	Senior Seminar in Crop Science and Soil Science	1
CSSC 492	Professional Internship Experience in Crop and Soil Sciences	1-3
CSSC 493	Research Experience in Crop and Soil Sciences	1-3
CSSC 495	Special Topics in Crop and Soil Sciences	1-6
ENT 402	Forest Entomology	3
ENT 470	Advanced Turfgrass Pest Management	2
FOR 150	Critical Thinking and Data Analysis	2
FOR 172	Forest System Mapping and Mensuration I	2

FOR 204	Silviculture	2	FOR 402	Forest Entomology	3
FOR 248	Forest History, Technology and Society	3	FOR 405	Forest Management	4
FOR 250	Professional Development II: Communications in Natural Resources	1	FOR 406	Forest Inventory, Analysis and Planning	4
FOR 252	Introduction to Forest Science	3	FOR 408	Applied Forest Ecology: Natural Forest Silviculture	3
FOR 260	Forest Ecology	4	FOR 411	Forest Tree Genetics and Biology	3
FOR 261	Forest Communities	2	FOR 414	World Forestry	3
FOR 264	Forest Wildlife	1	FOR 415	World Forestry Study Tour	1
FOR 265	Fire Management	1	FOR 420	Watershed and Wetlands Hydrology	4
FOR 273	Forest System Mapping and Mensuration II	3	FOR 422	Consulting Forestry	3
FOR 293	Independent Study in Forest Management	1-6	FOR 430	Forest Health and Protection	3
FOR 294	Independent Study in Forest Management	1-6	FOR 434	Forest Operations and Analysis	3
FOR 295	Special Topics in Forestry	1-6	FOR 472	Forest Soils	4
FOR 303	Silvics and Forest Tree Physiology	3	FOR 491	Special Topics in Forestry and Related Natural Resources	1-4
FOR 304	Theory of Silviculture	4	FOR 493	Independent Study in Forest Management	1-6
FOR 318	Forest Pathology	3	FOR 494	Independent Study in Forest Management	1-6
FOR 319	Forest Economics	3	FOR 501	Dendrology	3
FOR 330	North Carolina Forests	3	FOR 502	Forest Measurements	1
FOR 334	Operations Research Applications in Natural Resources	1	FOR 503	Tree Physiology	1
FOR 339	Dendrology	4	FOR 504	The Practice of Silviculture	3
FOR 350	Professional Development III: Ethical Dilemmas in Natural Resource Management	1	FOR 505	Forest Management	4
FOR 353	GIS and Remote Sensing for Environmental Analysis and Assessment	3	FOR 506	Silviculture Laboratory	1
FOR 374	Forest Measurement, Modeling, and Inventory	3	FOR 507	Silviculture Mini Course	1
			FOR 508	Applied Forest Ecology: Natural Forest Silviculture	3
			FOR 509	Forest Resource Policy	1

FOR 510	Introduction to GPS	1	HS 144	Weeds & Diseases of Ornamentals	3
FOR 513	Silviculture for Intensively Managed Plantations	3	HS 200	Home Horticulture	3
FOR 514	Woodland Stewardship	3	HS 201	The World of Horticulture: Principles and Practices	3
FOR 519	Forest Economics	3	HS 202	Home Plant Identification	3
FOR 520	Watershed and Wetlands Hydrology	4	HS 203	Home Plant Propagation	3
FOR 522	Consulting Forestry	3	HS 204	Home Landscape Maintenance	3
FOR 531	Wildland Fire Science	3	HS 205	Home Food Production	3
FOR 532	Wildland Firefighter	3	HS 215	Agricultural Genetics	3
FOR 534	Forest Operations and Analysis	3	HS 242	Introduction to Small Scale Landscape Design	3
FOR 540	Advanced Dendrology	3	HS 250	Home Landscape Design: Creating Garden Spaces	3
FOR 561	Forest Communities of the Southeastern Coastal Plain	1	HS 252	Landscape Graphic Communication	2
FOR 562	Forest Communities of the Southern Appalachians	1	HS 272	Landscape Design/Build	6
FOR 565	Plant Community Ecology	4	HS 280	Hands-On-Horticulture	3
FOR 574	Forest Mensuration and Modeling	3	HS 290	Horticulture: Careers and Opportunities	1
FOR 575	Advanced Terrestrial Ecosystem Ecology	3	HS 301	Plant Propagation	4
FOR 583	Tropical Forestry	3	HS 302	Gardening with Herbaceous Perennials	3
FOR 595	Special Topics	1-6	HS 303	Ornamental Plant Identification I	3
FS 462	Postharvest Physiology	3	HS 304	Ornamental Plant Identification II	3
FS 562	Postharvest Physiology	3	HS 357	Landscape Grading and Drainage	4
FW 221	Conservation of Natural Resources	3	HS 400	Residential Landscaping	6
FW 404	Wildlife Habitat Management	3	HS 410	Community Food Systems	3
GIS 512	Introduction to Environmental Remote Sensing	3	HS 411	Nursery Management	3
HS 131	Fruit & Vegetable Production	3	HS 416	Planting Design	4

HS 418	Digital Media Graphic for Landscape Designers	3	HS 495	Experimental Courses in Horticultural Science	1-6
HS 420	Green Infrastructure	3	HS 502	Plant Disease: Methods & Diagnosis	2
HS 421	Temperate-Zone Tree Fruits: Physiology and Culture	3	HS 516	Planting Design	4
HS 422	Small Fruit Production	3	HS 520	Green Infrastructure	3
HS 423		3	HS 521	Temperate-Zone Tree Fruits: Physiology and Culture	3
HS 428	Service-Learning in Urban Agriculture Systems	1	HS 523		3
HS 431	Vegetable Production	4	HS 532	Introduction to Permaculture	3
HS 432	Introduction to Permaculture	3	HS 533	Public Garden Administration	3
HS 433	Public Garden Administration	3	HS 541	Plant Breeding Methods	3
HS 440	Greenhouse Management	3	HS 550	Environmental Nursery Production	3
HS 442	Floriculture Crop Production	3	HS 551	Plant Nutrition	3
HS 451	Plant Nutrition	3	HS 562	Postharvest Physiology	3
HS 462	Postharvest Physiology	3	HS 576	Crop Physiology and Production in Controlled Environments	3
HS 471	Landscape Ecosystem Management	4	HS 583		3
HS 475	Horticulture Entrepreneurship	3	HS 590	Special Problems in Horticultural Science	1-6
HS 476	Crop Physiology and Production in Controlled Environments	3	NR 420	Watershed and Wetlands Hydrology	4
HS 480	Sustainable Food Production (capstone)	1	NR 460	Renewable Natural Resource Management and Policy	3
HS 491	Sustainable Agriculture Entrepreneurship Study Abroad	3	NR 491	Special Topics in Forestry and Related Natural Resources	1-4
HS 492	Horticulture Internship	1-3	NR 520	Watershed and Wetlands Hydrology	4
HS 493	Research Experience in Horticultural Science	1-3	NR 560	Renewable Natural Resource Management and Policy	3
HS 494	Teaching Experience in Horticultural Science	1-3	PP 144	Weeds & Diseases of Ornamentals	3
			PP 318	Forest Pathology	3

PP 470	Advanced Turfgrass Pest Management	2
PP 502	Plant Disease: Methods & Diagnosis	2
SMT 202	Anatomy and Properties of Renewable Materials	3
SSC 428	Service-Learning in Urban Agriculture Systems	1
SSC 440	Geographic Information Systems (GIS) in Soil Science and Agriculture	3
SSC 462	Soil-Crop Management Systems	3
SSC 540	Geographic Information Systems (GIS) in Soil Science and Agriculture	3

ARE 312	Agribusiness Marketing	3
ARE 321	Agricultural Financial Management	3
ARE 323	Agribusiness Finance	3
ARE 332	Human Resource Management for Agribusiness	3
ARE 336	Introduction to Resource and Environmental Economics	3
ARE 345	Global Agribusiness Management	3
ARE 370	Agribusiness New Venture Development	3
ARE 395	Special Topics in Agricultural and Resource Economics (300 level)	1-6
ARE 404	Advanced Agribusiness Management	3
ARE 412	Advanced Agribusiness Marketing	3
ARE 413	Applied Agribusiness Marketing	3
ARE 415	Introduction to Commodity Futures Markets	3
ARE 420	Taxation in Agriculture, Production, and Agribusiness	3
ARE 425	Contracts and Organizations in Agriculture	3
ARE 433	U.S. Agricultural Policy	3
ARE 444	Ethics in Agribusiness	3
ARE 448	International Agricultural Trade	3
ARE 455	Agribusiness Analytics	3
ARE 470	Agribusiness Entrepreneurship Clinical Skills Development	3
ARE 475	Food Policy	3

### Agriculture Electives

Code	Title	Hours	Counts towards
<b>Agriculture Elective</b>			
ARE 215	Small Business Accounting	3	
ARE 260	Marketing and Risk Management in the Pork Industry	1	
ARE 270	Principles of Agribusiness Entrepreneurship	3	
ARE 295	Special Topics in Agricultural & Resource Economics (200 Level)	1-6	
ARE 301	Intermediate Microeconomics	3	
ARE 303	Farm Management	3	
ARE 304	Agribusiness Management	3	
ARE 306	Agricultural Law	3	
ARE 309	Environmental Law & Economic Policy	3	
ARE 311	Agricultural Markets	3	

ARE 490	Career Seminar in Agriculture & Resource Economics	1	AEE 327	Conducting Summer Programs in Agricultural Education	1
ARE 492	External Learning Experience	1-6	AEE 350	Personal Leadership Development in Agriculture and Life Sciences	3
ARE 493	Special Problems/ Research Exploration	1-6	AEE 360	Developing Team Leadership in Agriculture and Life Sciences	3
ARE 494	Agribusiness Study Abroad	1-6	AEE 423	Practicum in Agricultural Extension/ Industry	8
ARE 495	Special Topics in Agricultural and Resource Economics	1-6	AEE 424	Planning Agricultural Educational Programs	3
ARE 590	Special Topics in ARE	1-99	AEE 426	Methods of Teaching Agriculture	3
EC 301	Intermediate Microeconomics	3	AEE 427	Student Teaching in Agriculture	8
EC 336	Introduction to Resource and Environmental Economics	3	AEE 433	Leadership and Management of Volunteers in Agricultural and Extension Education	3
<b>Group C - Applied Sci &amp; Tech</b>			AEE 435	Professional Presentations in Agricultural Organizations	3
AEE 101	Introduction to Career and Technical Education	1	AEE 460	Organizational Leadership Development in Agriculture and Life Sciences	3
AEE 206	Introduction to Teaching Agriculture	3	AEE 478	Advanced Issues in Extension Education	3
AEE 208	Agricultural Biotechnology: Issues and Implications	3	AEE 490	Seminar in Agricultural and Extension Education	1
AEE 230	Introduction to Cooperative Extension	3	AEE 533	Leadership and Management of Volunteers in Agricultural and Extension Education	3
AEE 303	Administration and Supervision of Student Organizations	3	ALS 110	Academic and Career Skills Seminar	1
AEE 311	Communication Methods and Media	3			
AEE 322	Experiential Learning in Agriculture	3			
AEE 323	Leadership Development in Agriculture and Life Sciences	3			
AEE 325	Planning and Delivering Non-Formal Education	3			
AEE 326	Teaching Diverse Learners in AED	3			



ANS 105	Introduction to Companion Animal Science	3	ANS 540	Animal Genetic Improvement	3
ANS 110	Introduction to Equine Science	3	ANS 553	Physiology and Genetics of Growth and Development	3
ANS 150	Introduction to Animal Science	3	ANS 554	Lactation, Milk and Nutrition	3
ANS 151	Introduction to Animal Science Lab	1	BAE 100	Introduction to Biological and Agricultural Engineering and Technology	1
ANS 201	Techniques of Animal Care	2	BAE 202	Introduction to Biological and Agricultural Engineering Methods	4
ANS 208	Agricultural Biotechnology: Issues and Implications	3	BAE 302	Transport Phenomena	3
ANS 225	Principles of Animal Nutrition	3	BAE 322	Introduction to Food Process Engineering	3
ANS 303	Principles of Equine Evaluation	2	BAE 361	Analytical Methods in Engineering Design	3
ANS 304	Dairy Cattle Evaluation	2	BAE 371	Fundamentals of Hydrology for Engineers	3
ANS 309	Livestock Evaluation	3	BAE 401	Sensors and Controls	3
ANS 322	Muscle Foods and Eggs	3	BAE 435	Precision Agriculture Technology	3
ANS 324	Milk and Dairy Products	3	BAE 451	Engineering Design I	2
ANS 400	Companion Animal Management	3	BAE 452	Engineering Design II	2
ANS 402	Beef Cattle Management	3	BAE 462	Machinery Design and Applications	3
ANS 403	Swine Management	3	BAE 472	Irrigation and Drainage	3
ANS 404	Dairy Cattle Management	3	BAE 473	Introduction to Hydrologic and Water Quality Modeling	3
ANS 408	Small Ruminant Management	3	BAE 474	Principles and Applications of Ecological Engineering	3
ANS 410	Equine Breeding Farm Management	3	BAE 481	Structures & Environment	3
ANS 425	Feed Manufacturing Technology	3	BAE 501	Sensors and Controls	3
ANS 440	Animal Genetic Improvement	3			
ANS 453	Physiology and Genetics of Growth and Development	3			
ANS 454	Lactation, Milk and Nutrition	3			
ANS 525	Feed Manufacturing Technology	3			

BAE 535	Precision Agriculture Technology	3	ECI 424	Student Teaching in Modern Foreign Languages	12
BAE 572	Irrigation and Drainage	3	ENT 470	Advanced Turfgrass Pest Management	2
BAE 573	Introduction to Hydrologic and Water Quality Modeling	3	FM 425	Feed Manufacturing Technology	3
BAET 201	Shop Processes and Management	3	FM 525	Feed Manufacturing Technology	3
BAET 323	Water Management	3	FS 322	Muscle Foods and Eggs	3
BAET 332	Management of Animal Environments	4	FS 324	Milk and Dairy Products	3
BAET 333	Processing Agricultural Products	4	FS 435	Food Safety Management Systems	3
BAET 343	Agricultural Electrification	4	FS 535	Food Safety Management Systems	3
BAET 411	Agricultural Machinery and Power Units	4	MSE 203		3
BAET 432	Agricultural and Environmental Safety and Health	3	NTR 425	Feed Manufacturing Technology	3
BAET 443	Environmental Restoration Implementation	3	NTR 454	Lactation, Milk and Nutrition	3
BEC 330	Principles and Applications of Bioseparations	2	NTR 525	Feed Manufacturing Technology	3
BEC 436	Introduction to Downstream Process Development	2	PB 208	Agricultural Biotechnology: Issues and Implications	3
BEC 440		3	PO 322	Muscle Foods and Eggs	3
BEC 536	Introduction to Downstream Process Development	2	PO 425	Feed Manufacturing Technology	3
BEC 540		3	PO 525	Feed Manufacturing Technology	3
BME 203		3	PP 470	Advanced Turfgrass Pest Management	2
BME 207	Biomedical Electronics	4	SSC 440	Geographic Information Systems (GIS) in Soil Science and Agriculture	3
BME 342		3	SSC 473	Introduction to Hydrologic and Water Quality Modeling	3
BME 385	Bioinstrumentation	3			
BME 412	Biomedical Signal Processing	3			
BME 425	Bioelectricity	3			
BME 525	Bioelectricity	3			
CS 470	Advanced Turfgrass Pest Management	2			

SSC 540	Geographic Information Systems (GIS) in Soil Science and Agriculture	3	BAE 325	Introductory Geomatics	3
SSC 573	Introduction to Hydrologic and Water Quality Modeling	3	BAE 425	Industrial Microbiology and Bioprocessing	3
USC 291	Service Learning Program Leader Development I	1	BAE 435	Precision Agriculture Technology	3
USC 292	Service Learning Program Leader Development II	2	BAE 525	Industrial Microbiology and Bioprocessing	3
<b>Group C - Applied Sci &amp; Tech</b>			BAE 535	Precision Agriculture Technology	3
AEC 420	Introduction to Fisheries Science	3	BBS 201	Introduction to Biopharmaceutica Science	3
AEE 206	Introduction to Teaching Agriculture	3	BBS 301	Process Validation Science	3
AEE 303	Administration and Supervision of Student Organizations	3	BBS 426	Upstream Biomanufacturing Laboratory	2
AEE 322	Experiential Learning in Agriculture	3	BBS 526	Upstream Biomanufacturing Laboratory	2
AEE 327	Conducting Summer Programs in Agricultural Education	1	BCH 220	Role of Biotechnology in Society	3
AEE 424	Planning Agricultural Educational Programs	3	BEC 426	Upstream Biomanufacturing Laboratory	2
AEE 426	Methods of Teaching Agriculture	3	BEC 483	Tissue Engineering Technologies	2
AEE 427	Student Teaching in Agriculture	8	BEC 526	Upstream Biomanufacturing Laboratory	2
ANS 322	Muscle Foods and Eggs	3	BEC 583	Tissue Engineering Technologies	2
ANS 324	Milk and Dairy Products	3	BME 444	Orthopaedic Biomechanics	3
ANS 330	Laboratory Animal Science	3	BME 375	Biomedical Microcontroller Applications	3
ANS 411	Management of Growing and Performance Horses	3	BME 365	Linear Systems in Biomedical Engineering	3
ANS 425	Feed Manufacturing Technology	3	BME 451	BME Senior Design: Product Development	3
ANS 525	Feed Manufacturing Technology	3	BME 452	BME Senior Design: Product Implementation and Strategy	3

BME 466	Polymeric Biomaterials Engineering	3	CS 565	Turf Management Systems and Environmental Quality	3
BME 467	Mechanics of Tissues & Implants Requirements	3	CSSC 490	Senior Seminar in Crop Science and Soil Science	1
BME 483	Tissue Engineering Technologies	2	ECI 424	Student Teaching in Modern Foreign Languages	12
BME 484	Fundamentals of Tissue Engineering	3	ENT 203	An Introduction to the Honey Bee and Beekeeping	3
BME 544	Orthopaedic Biomechanics	3	ENT 401	Honey Bee Biology and Management	3
BME 566	Polymeric Biomaterials Engineering	3	ES 100	Introduction to Environmental Sciences	3
BME 583	Tissue Engineering Technologies	2	ES 200	Climate Change and Sustainability	3
BME 584	Fundamentals of Tissue Engineering	3	ES 300	Energy and Environment	3
CS 200	Introduction to Turfgrass Management	4	ES 400	Analysis of Environmental Issues	3
CS 210	Lawns and Sports Turf	3	FM 425	Feed Manufacturing Technology	3
CS 213	Crop Science	3	FM 460	Feed Mill Operations and Leadership	3
CS 216	Southern Row Crop Production - Cotton, Peanuts, and Tobacco	3	FM 480	Feed Quality Assurance & Formulation	3
CS 218	Southern Row Crop Production - Corn, Small Grains and Soybeans	3	FM 490	Feed Science Seminar	1
CS 230	Introduction to Agroecology	3	FM 525	Feed Manufacturing Technology	3
CS 312		3	FOR 318	Forest Pathology	3
CS 400	Turf Cultural Systems	3	FOR 420	Watershed and Wetlands Hydrology	4
CS 411	Crop Ecology	3	FOR 472	Forest Soils	4
CS 413	Plant Breeding	2	FOR 520	Watershed and Wetlands Hydrology	4
CS 414	Weed Science	4	FS 201	Introduction to Food Science	3
CS 415	Integrated Pest Management	3	FS 290	Careers in Food and Bioprocessing Sciences	1
CS 424	Seed Physiology	3	FS 322	Muscle Foods and Eggs	3
CS 430	Advanced Agroecology	4			
CS 465	Turf Management Systems and Environmental Quality	3			
CS 524	Seed Physiology	3			

FS 324	Milk and Dairy Products	3	FW 353	Wildlife Management	3
FS 330	Science of Food Preparation	3	FW 403	Urban Wildlife Management	3
FS 352	Introduction to Microbiological Food Safety Hazards	3	FW 411	Human Dimensions of Wildlife and Fisheries	3
FS 354	Food Sanitation	3	FW 453	Principles of Wildlife Science	4
FS 416	Quality Control in Food and Bioprocessing	3	FW 460	International Wildlife Management and Conservation	3
FS 421	Food Preservation	3	FW 465	African Ecology and Conservation	4
FS 426	Upstream Biomanufacturing Laboratory	2	FW 511	Human Dimensions of Wildlife and Fisheries	3
FS 435	Food Safety Management Systems	3	FW 560	International Wildlife Management and Conservation	3
FS 453	Food Laws and Regulations	3	FW 565	African Ecology and Conservation	4
FS 462	Postharvest Physiology	3	GPH 201	Fundamentals of Global Public Health	3
FS 475	Problems and Design in Food and Bioprocessing Science	3	HS 432	Introduction to Permaculture	3
FS 516	Quality Control in Food and Bioprocessing	3	HS 462	Postharvest Physiology	3
FS 521	Food Preservation	3	HS 532	Introduction to Permaculture	3
FS 526	Upstream Biomanufacturing Laboratory	2	HS 562	Postharvest Physiology	3
FS 535	Food Safety Management Systems	3	IDS 303	Humans and the Environment	3
FS 553	Food Laws and Regulations	3	NR 303	Humans and the Environment	3
FS 562	Postharvest Physiology	3	NR 350	International Sustainable Resource Use	4
FW 221	Conservation of Natural Resources	3	NR 406	Conservation of Biological Diversity	3
FW 311	Piedmont Wildlife Ecology and Management	3	NR 420	Watershed and Wetlands Hydrology	4
FW 312	Fisheries Techniques and Management	1	NR 460	Renewable Natural Resource Management and Policy	3
FW 313	Mountain Wildlife Ecology and Management	1	NR 520	Watershed and Wetlands Hydrology	4
FW 314	Coastal Ecology and Management	1			

NR 560	Renewable Natural Resource Management and Policy	3	ANS 322	Muscle Foods and Eggs	3
NTR 425	Feed Manufacturing Technology	3	ANS 425	Feed Manufacturing Technology	3
NTR 525	Feed Manufacturing Technology	3	ANS 525	Feed Manufacturing Technology	3
PO 322	Muscle Foods and Eggs	3	BIO 227	Understanding Structural Diversity through Biological Illustration	3
PO 424	Poultry Meat Production	3	BME 204		3
PO 425	Feed Manufacturing Technology	3	BME 217	Biomedical Electronics Laboratory	1
PO 435	Poultry Incubation & Breeding	4	BME 298	Biomedical Engineering Design and Manufacturing I	2
PO 525	Feed Manufacturing Technology	3	BME 398	Biomedical Engineering Design and Manufacturing II	2
PP 318	Forest Pathology	3	CS 470	Advanced Turfgrass Pest Management	2
SSC 440	Geographic Information Systems (GIS) in Soil Science and Agriculture	3	CSSC 490	Senior Seminar in Crop Science and Soil Science	1
SSC 462	Soil-Crop Management Systems	3	ENT 470	Advanced Turfgrass Pest Management	2
SSC 540	Geographic Information Systems (GIS) in Soil Science and Agriculture	3	FM 425	Feed Manufacturing Technology	3
TE 466	Polymeric Biomaterials Engineering	3	FM 525	Feed Manufacturing Technology	3
TE 467	Mechanics of Tissues & Implants Requirements	3	FOR 318	Forest Pathology	3
VMP 401	Poultry Diseases	4	FOR 420	Watershed and Wetlands Hydrology	4
VMP 420	Disease of Farm Animals	3	FOR 472	Forest Soils	4
<b>Group C - Applied Sci &amp; Tech</b>			FOR 520	Watershed and Wetlands Hydrology	4
AEC 419	Freshwater Ecology	4	FS 322	Muscle Foods and Eggs	3
AEC 423	Introduction to Fisheries Sciences Laboratory	1	FS 435	Food Safety Management Systems	3
AEC 519	Freshwater Ecology	4	FS 462	Postharvest Physiology	3
BAET 323	Water Management	3	FS 535	Food Safety Management Systems	3

FS 562	Postharvest Physiology	3	HS 421	Temperate-Zone Tree Fruits: Physiology and Culture	3
FW 221	Conservation of Natural Resources	3	HS 422	Small Fruit Production	3
FW 404	Wildlife Habitat Management	3	HS 423		3
FW 460	International Wildlife Management and Conservation	3	HS 431	Vegetable Production	4
FW 560	International Wildlife Management and Conservation	3	HS 440	Greenhouse Management	3
HS 200	Home Horticulture	3	HS 442	Floriculture Crop Production	3
HS 201	The World of Horticulture: Principles and Practices	3	HS 462	Postharvest Physiology	3
HS 203	Home Plant Propagation	3	HS 471	Landscape Ecosystem Management	4
HS 242	Introduction to Small Scale Landscape Design	3	HS 516	Planting Design	4
HS 250	Home Landscape Design: Creating Garden Spaces	3	HS 521	Temperate-Zone Tree Fruits: Physiology and Culture	3
HS 252	Landscape Graphic Communication	2	HS 523		3
HS 272	Landscape Design/Build	6	HS 562	Postharvest Physiology	3
HS 290	Horticulture: Careers and Opportunities	1	IDS 303	Humans and the Environment	3
HS 301	Plant Propagation	4	NR 300	Natural Resource Measurements	4
HS 302	Gardening with Herbaceous Perennials	3	NR 303	Humans and the Environment	3
HS 303	Ornamental Plant Identification I	3	NR 400	Natural Resource Management	4
HS 304	Ornamental Plant Identification II	3	NR 420	Watershed and Wetlands Hydrology	4
HS 357	Landscape Grading and Drainage	4	NR 421	Wetland Science and Management	3
HS 400	Residential Landscaping	6	NR 460	Renewable Natural Resource Management and Policy	3
HS 411	Nursery Management	3	NR 484	Environmental Impact Assessment	4
HS 416	Planting Design	4	NR 500	Natural Resource Management	4
			NR 520	Watershed and Wetlands Hydrology	4
			NR 521	Wetland Science and Management	3
			NR 560	Renewable Natural Resource Management and Policy	3

NTR 420		3
NTR 425	Feed Manufacturing Technology	3
NTR 525	Feed Manufacturing Technology	3
PO 201	Poultry Science and Production	3
PO 201A	Poultry Science and Production	3
PO 202A	Poultry Science and Production Laboratory	1
PO 290	Poultry Seminar	1
PO 322	Muscle Foods and Eggs	3
PO 340	Live Poultry and Poultry Product Evaluation, Grading, and Inspection	3
PO 410	Production and Management of Game Birds in Confinement	3
PO 411	Agrosecurity	3
PO 421	Commercial Egg Production	3
PO 425	Feed Manufacturing Technology	3
PO 433	Poultry Processing and Products	3
PO 525	Feed Manufacturing Technology	3
PO 533	Poultry Processing and Products	3
PP 315	Principles of Plant Pathology	4
PP 318	Forest Pathology	3
PP 470	Advanced Turfgrass Pest Management	2
SSC 185	Land and Life	3
SSC 342	Soil and Plant Nutrient Analysis	1
SSC 421	Role of Soils in Environmental Management	3
SSC 440	Geographic Information Systems (GIS) in Soil Science and Agriculture	3

SSC 442	Soil and Environmental Biogeochemistry	3
SSC 452	Soil Classification	4
SSC 461	Soil Physical Properties and Plant Growth	3
SSC 462	Soil-Crop Management Systems	3
SSC 470	Wetland Soils	3
SSC 540	Geographic Information Systems (GIS) in Soil Science and Agriculture	3
SSC 570	Wetland Soils	3
TOX 201	Poisons, People and the Environment	3
TOX 401	Principles of Toxicology	4
TOX 415	Environmental Toxicology and Chemistry	4
TOX 501	Principles of Toxicology	4

## Semester Sequence

This is a sample.

### First Year

Fall Semester		Hours
AEE 101	Introduction to Career and Technical Education <sup>1</sup>	1
AEE 103	Fundamentals of Agricultural and Extension Education <sup>2</sup>	1
BIO 181	Introductory Biology: Ecology, Evolution, and Biodiversity	4
COM 110	Public Speaking	3
ENG 101	Academic Writing and Research	4
MA 107	Precalculus I	3
GEP Health and Exercise Studies ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/</a> )		1

**Hours** **17**

### Spring Semester

AEE 226	Computer Applications and Information Technology in Agricultural & Extension Ed <sup>1</sup>	3
ANS 150 & ANS 151	Introduction to Animal Science and Introduction to Animal Science Lab	4
CH 101 & CH 102	Chemistry - A Molecular Science and General Chemistry Laboratory	4
GEP Mathematical Sciences ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-mathematical-sciences/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-mathematical-sciences/</a> )		3



GEP Health and Exercise Studies (<http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/>) 1

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**Hours** **15**

### Second Year

#### Fall Semester

AEE 206	Introduction to Teaching Agriculture <sup>1</sup>	3
BAET 201	Shop Processes and Management	3
PY 211	College Physics I	4
GEP Humanities ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/</a> )		3

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**Hours** **13**

#### Spring Semester

Agriculture Elective (p. 7)		2
SSC 200 & SSC 201	Soil Science and Soil Science Laboratory	4
Economics Elective (p. 1)		3
Plant Science Elective (p. 3)		3
GEP Interdisciplinary Perspectives ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-interdisciplinary-perspectives/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-interdisciplinary-perspectives/</a> )		3

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**Hours** **15**

### Third Year

#### Fall Semester

AEE 322	Experiential Learning in Agriculture <sup>1</sup>	3
BAE 325	Introductory Geomatics	3
BAET 343	Agricultural Electrification	4
EDP 304	Educational Psychology <sup>1</sup>	3
GEP Humanities ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/</a> )		3

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**Hours** **16**

#### Spring Semester

AEE 303	Administration and Supervision of Student Organizations <sup>1</sup>	3
AEE 326	Teaching Diverse Learners in AED <sup>1</sup>	3
BAET 332	Management of Animal Environments	4
BAET 411	Agricultural Machinery and Power Units	4
ED 311	Classroom Assessment Principles and Practices <sup>1</sup>	2
ED 312	Classroom Assessment Principles and Practices Professional Learning Lab <sup>1</sup>	1

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**Hours** **17**

### Fourth Year

#### Fall Semester

AEE 327	Conducting Summer Programs in Agricultural Education	1
AEE 426	Methods of Teaching Agriculture <sup>1</sup>	3
BAET 432	Agricultural and Environmental Safety and Health	3
ELP 344	School and Society <sup>1</sup>	3
GEP Interdisciplinary Perspectives ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-interdisciplinary-perspectives/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-interdisciplinary-perspectives/</a> )		2

Agriculture Elective (p. 7)		3
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**Hours** **15**

#### Spring Semester

AEE 424	Planning Agricultural Educational Programs <sub>1</sub>	3
AEE 427	Student Teaching in Agriculture <sup>1</sup>	8
AEE 491	Seminar in Agricultural Education	1

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**Hours** **12**

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**Total Hours** **120**

<sup>1</sup> A minimum grade of C- is required for graduation. A minimum grade of C is required for teacher licensure.

<sup>2</sup> Incoming freshmen complete AEE 103 Fundamentals of Agricultural and Extension Education. Transfer students may complete ALS 103 Freshman Transitions and Diversity in Agriculture & Life Sciences or ALS 303 Transfer Transitions and Diversity in Agriculture & Life Sciences.