

# Agricultural Business Management (BS)

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

The Bachelor of Science degree in Agricultural Business Management prepares graduates for increasing opportunities to enter managerial positions in ag-related businesses. The academic program combines core courses in agricultural business and economics with courses in science and technology. Students learn to apply the concepts, principles and terminology of business and economics to real-world issues and opportunities.

The Agricultural Business Management Program prepares graduates for careers in management, marketing, sales, finance, supply chain, entrepreneurship, and related fields. The program has sufficient flexibility to provide more extensive course work in science and math for those students desiring to prepare for advanced graduate study. The concentration in biological sciences prepares graduates for management, marketing, and sales careers in fields such as biotechnology, pharmaceuticals, health care, environmental protection, and food processing. Graduates specializing in agribusiness entrepreneurship are trained in value creation and prepared to address the strong demand in agtech, biotech, and foodtech.

For more information about this program, including contact information, visit our website (<https://cals.ncsu.edu/agricultural-and-resource-economics/students/undergraduate/#undergraduate-offerings>).

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## Plan Requirements

Code	Title	Hours	Counts towards
<b>Orientation</b>			
ALS 103	Freshman Transitions and Diversity in Agriculture & Life Sciences	1	
or ALS 303	Transfer Transitions and Diversity in Agriculture & Life Sciences		
<b>Communications &amp; Tech Fluency</b>			
COM 110	Public Speaking	3	
Select one of the following:		3	
COM 112	Interpersonal Communication		
COM 211	Argumentation and Advocacy		
COM 226	Introduction to Public Relations		
ENG 332	Communication for Business and Management		

AEE 226	Computer Applications and Information Technology in Agricultural & Extension Ed	3
or CSC 200		

### Mathematical Sciences

Select one of the following: 3

MA 121	Elements of Calculus	
MA 131	Calculus for Life and Management Sciences A	
MA 141	Calculus I	

Select one of the following: 3

MA 114	Introduction to Finite Mathematics with Applications	
MA 231	Calculus for Life and Management Sciences B	
MA 241	Calculus II	

Statistics - Select one of the following: 3

BUS 350	Economics and Business Statistics	
ST 311	Introduction to Statistics	
ST 350	Economics and Business Statistics	

### Natural Sciences

Select one of the following: 4

BIO 105 & BIO 106	Biology in the Modern World and Biology in the Modern World Laboratory	
BIO 181	Introductory Biology: Ecology, Evolution, and Biodiversity	
PB 200	Plant Life	

Natural Science Electives (p. 2) 7

### Department Course Requirements

ARE 201	Introduction to Agricultural & Resource Economics <sup>1</sup>	3
or EC 201	Principles of Microeconomics	
EC 202	Principles of Macroeconomics	3

ACC 220	Introduction to Managerial Accounting	3
or ACC 210	Concepts of Financial Reporting	
ARE 303	Farm Management	3
or ARE 304	Agribusiness Management	
ARE 306	Agricultural Law	3
or ARE 309	Environmental Law & Economic Policy	
ARE 311	Agricultural Markets	3
or ARE 312	Agribusiness Marketing	
Select one of the following:		3
ARE 321	Agricultural Financial Management	
ARE 323	Agribusiness Finance	
BUS 320	Financial Management	
ARE 301	Intermediate Microeconomics	3
or EC 301	Intermediate Microeconomics	
ARE 433	U.S. Agricultural Policy	3
ARE 490	Career Seminar in Agriculture & Resource Economics	1
ARE 336	Introduction to Resource and Environmental Economics	3
ARE 400-level Electives (p. 3)		6
ARE Electives (p. 3)		6
<b>Restricted Electives</b>		
Technical Electives (p. 4)		9
Select 9 units from either of the following:		9
Technical Electives (p. 4)		
Departmental Electives (p. 30)		
<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 Social Sciences ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-social-sciences/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-social-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-health-exercise-studies/</a> )		2

GEP Additional Breadth ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/</a> ) (Humanities/Social Sciences/Visual and Performing Arts)	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
GEP U.S. Diversity ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-us-diversity/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-us-diversity/</a> ) (verify requirement)	
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>Free Electives</b>	
Free Electives	9
Select courses with enough credits to meet the minimum graduation requirement of 120 total credit hours.	
<b>Total Hours</b>	<b>120</b>

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

**Natural Science Electives**

Code	Title	Hours	Counts towards
CH 100	Chemistry and Society	4	
CH 101	Chemistry - A Molecular Science	3	
CH 102	General Chemistry Laboratory	1	
CH 201	Chemistry - A Quantitative Science	3	
CH 202	Quantitative Chemistry Laboratory	1	
CH 220	Introductory Organic Chemistry	3	
CH 221	Organic Chemistry I	3	

CH 222	Organic Chemistry I Lab	1
MEA 100	Earth System Science: Exploring the Connections	4
MEA 101	Geology I: Physical	3
MEA 110	Geology I Laboratory	1
MEA 130	Introduction to Weather and Climate	3
MEA 135	Introduction to Weather and Climate Laboratory	1
MEA 150	Environmental Issues in Water Resources	4
MEA 200	Introduction to Oceanography	3
PY 131	Conceptual Physics	4
PY 205	Physics for Engineers and Scientists I	3
PY 206	Physics for Engineers and Scientists I Laboratory	1
PY 208	Physics for Engineers and Scientists II	3
PY 209	Physics for Engineers and Scientists II Laboratory	1
PY 211	College Physics I	4
PY 212	College Physics II	4

**ARE 400-level Electives**

Code	Title	Hours	Counts towards
ARE 492 and ARE 493 do not count in this requirement.			
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
ARE 490	Career Seminar in Agriculture & Resource Economics	1
ARE 494	Agribusiness Study Abroad	1-6
ARE 495	Special Topics in Agricultural and Resource Economics	1-6

**ARE Electives**

Code	Title	Hours	Counts towards
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 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
ARE 490	Career Seminar in Agriculture & Resource Economics	1
ARE 494	Agribusiness Study Abroad	1-6
ARE 495	Special Topics in Agricultural and Resource Economics	1-6

EC 301	Intermediate Microeconomics	3
EC 336	Introduction to Resource and Environmental Economics	3

## Technical Electives

**Code Title Hours Counts towards**

For a technical elective, select a course from among the following set of course listings with prefixes of : AEE, ANS, BAE, BEC, BIO, CH, CS, ENT, ES, ET, FOR, FS, FW, GN, HS, MB, MEA, NR, NTR, PB, PO, PY, SSC, TOX, VMP. (Before registering for these courses students should check to make sure they have met the necessary prerequisites and that credit restrictions do not apply- e.g. credit is not allowed for both BIO 105 and BIO 181)

AEC 360	Ecology	4
AEC 380	Water Resources: Global Issues in Ecology, Policy, Management, and Advocacy	3
AEC 419	Freshwater Ecology	4
AEC 420	Introduction to Fisheries Science	3
AEC 423	Introduction to Fisheries Sciences Laboratory	1
AEC 441	Biology of Fishes	3
AEC 442	Biology of Fishes Laboratory	1
AEC 460	Field Ecology and Methods	4
AEC 509	Ecology and Conservation of Freshwater Invertebrates	3
AEC 515	Fish Physiology	3
AEC 519	Freshwater Ecology	4
AEC 586	Aquaculture	3
AEC 587	Aquaculture Laboratory	1
AEC 761	Conservation and Climate Science	3

AEE 101	Introduction to Career and Technical Education	1	AEE 424	Planning Agricultural Educational Programs	3
AEE 103	Fundamentals of Agricultural and Extension Education	1	AEE 426	Methods of Teaching Agriculture	3
AEE 208	Agricultural Biotechnology: Issues and Implications	3	AEE 427	Student Teaching in Agriculture	8
AEE 226	Computer Applications and Information Technology in Agricultural & Extension Ed	3	AEE 433	Leadership and Management of Volunteers in Agricultural and Extension Education	3
AEE 230	Introduction to Cooperative Extension	3	AEE 435	Professional Presentations in Agricultural Organizations	3
AEE 303	Administration and Supervision of Student Organizations	3	AEE 460	Organizational Leadership Development in Agriculture and Life Sciences	3
AEE 311	Communication Methods and Media	3	AEE 478	Advanced Issues in Extension Education	3
AEE 322	Experiential Learning in Agriculture	3	AEE 490	Seminar in Agricultural and Extension Education	1
AEE 323	Leadership Development in Agriculture and Life Sciences	3	AEE 491	Seminar in Agricultural Education	1
AEE 325	Planning and Delivering Non-Formal Education	3	AEE 492	External Learning Experience in Agricultural and Extension Education	1-6
AEE 326	Teaching Diverse Learners in AED	3	AEE 493	Special Problems in Agriculture and Extension Education	1-6
AEE 327	Conducting Summer Programs in Agricultural Education	1	AEE 495	Special Topics in Agricultural and Extension Education	1-3
AEE 350	Personal Leadership Development in Agriculture and Life Sciences	3	AEE 500	Agricultural Education, Schools and Society	3
AEE 360	Developing Team Leadership in Agriculture and Life Sciences	3	AEE 501	Foundations Of Agricultural and Extension Education	3
AEE 423	Practicum in Agricultural Extension/ Industry	8	AEE 503	Youth Program Management	3

AEE 505	Trends and Issues in Agricultural and Extension Education	3	AEE 577	Evaluation in Agricultural and Extension Education	3
AEE 507	Comparative Agricultural and Extension Education	3	AEE 578	Scientific Inquiry in Agricultural and Extension Education	3
AEE 521	Program Planning in Agricultural and Extension Education	3	AEE 579	Research Design in Agricultural and Extension Education	3
AEE 522	Occupational Experience in Agriculture	3	AEE 595	Special Topics in Agricultural and Extension Education	1-6
AEE 523	Adult Education in Agriculture	3	ALS 103	Freshman Transitions and Diversity in Agriculture & Life Sciences	1
AEE 524	Coordinating the High School Agricultural Education Program	3	ALS 303	Transfer Transitions and Diversity in Agriculture & Life Sciences	1
AEE 526	Information Technologies in Agricultural and Extension Education	3	ANS 105	Introduction to Companion Animal Science	3
AEE 529	Curriculum Development in Agricultural and Extension Education	3	ANS 110	Introduction to Equine Science	3
AEE 533	Leadership and Management of Volunteers in Agricultural and Extension Education	3	ANS 150	Introduction to Animal Science	3
AEE 535	Teaching Agriculture in Secondary Schools	3	ANS 151	Introduction to Animal Science Lab	1
AEE 545	Methods of Change in Agricultural and Human Sciences		ANS 201	Techniques of Animal Care	2
AEE 550	Leadership Theory	3	ANS 205	Physiology of Domestic Animals	3
AEE 560	Organizational Behavior and Administrative Leadership in Agricultural & Human Science	3	ANS 206	Anatomy of Domestic Animals Lab	1
AEE 565	Community Leadership	3	ANS 208	Agricultural Biotechnology: Issues and Implications	3
			ANS 215	Agricultural Genetics	3
			ANS 220	Reproductive Physiology	3
			ANS 221	Reproductive Physiology Lab	1
			ANS 225	Principles of Animal Nutrition	3
			ANS 230	Animal Nutrition	3

ANS 231	Animal Nutrition Lab	1	ANS 330	Laboratory Animal Science	3
ANS 240	Livestock Merchandising	3	ANS 395	Animal Science Study Abroad	1-6
ANS 240A	Livestock Merchandising	3	ANS 400	Companion Animal Management	3
ANS 260	Basic Swine Science	2	ANS 402	Beef Cattle Management	3
ANS 261	Swine Health and Biosecurity	1	ANS 403	Swine Management	3
ANS 262	Swine Breeding and Gestation Management	1	ANS 404	Dairy Cattle Management	3
ANS 263	Farrowing Management	1	ANS 408	Small Ruminant Management	3
ANS 264	Swine Nursery and Finishing Management	1	ANS 410	Equine Breeding Farm Management	3
ANS 265	Contemporary Issues in the Swine Industry	1	ANS 411	Management of Growing and Performance Horses	3
ANS 266	Swine Environment Management	1	ANS 415	Comparative Nutrition	3
ANS 267	Swine Manure and Nutrient Management	1	ANS 425	Feed Manufacturing Technology	3
ANS 268	Employee Management for the Swine Industry	1	ANS 440	Animal Genetic Improvement	3
ANS 269	Internship in the Swine Industry	1	ANS 452	Comparative Reproductive Physiology and Biotechnology	3
ANS 270	Pork Export Markets from a Swine Production Perspective	1	ANS 453	Physiology and Genetics of Growth and Development	3
ANS 271	Swine Nutrition	1	ANS 454	Lactation, Milk and Nutrition	3
ANS 281	Professional Development of PreVeterinary Track Students	1	ANS 480	Judging Team	1
ANS 290	Professional Development for Animal Science Careers	2	ANS 492	Professional Internship Experience in the Animal Sciences	1-3
ANS 303	Principles of Equine Evaluation	2	ANS 493	Research Experience in the Animal Sciences	1-3
ANS 304	Dairy Cattle Evaluation	2	ANS 494	Teaching Experience in the Animal Sciences	1-3
ANS 309	Livestock Evaluation	3	ANS 495	Special Topics in Animal Science	1-3
ANS 322	Muscle Foods and Eggs	3	ANS 515	Comparative Nutrition	3
ANS 324	Milk and Dairy Products	3	ANS 525	Feed Manufacturing Technology	3

ANS 530	Advanced Applied Animal Reproduction	3	BAE 321	Bioprocessing Engineering Fundamentals	3
ANS 531	Advanced Applied Animal Reproduction Lab	1	BAE 322	Introduction to Food Process Engineering	3
ANS 540	Animal Genetic Improvement	3	BAE 325	Introductory Geomatics	3
ANS 550	Applied Ruminant Nutrition	3	BAE 361	Analytical Methods in Engineering Design	3
ANS 552	Comparative Reproductive Physiology and Biotechnology	3	BAE 371	Fundamentals of Hydrology for Engineers	3
ANS 553	Physiology and Genetics of Growth and Development	3	BAE 376	Watershed Assessment and Water Quality Protection	3
ANS 554	Lactation, Milk and Nutrition	3	BAE 401	Sensors and Controls	3
ANS 561	Equine Nutrition	3	BAE 425	Industrial Microbiology and Bioprocessing	3
ANS 571	Regulation of Metabolism	3	BAE 435	Precision Agriculture Technology	3
ANS 575	Current Topics in Genomics and Proteomics in Animal Science	3	BAE 451	Engineering Design I	2
ANS 590	Topical Problems in Animal Science	1-3	BAE 452	Engineering Design II	2
BAE 100	Introduction to Biological and Agricultural Engineering and Technology	1	BAE 462	Machinery Design and Applications	3
BAE 200	Computer Methods in Biological Engineering	2	BAE 472	Irrigation and Drainage	3
BAE 202	Introduction to Biological and Agricultural Engineering Methods	4	BAE 473	Introduction to Hydrologic and Water Quality Modeling	3
BAE 203	Introduction to AutoCAD Civil 3D for Environmental & Ecological Engineers	2	BAE 474	Principles and Applications of Ecological Engineering	3
BAE 204	Introduction to Environmental and Ecological Engineering	2	BAE 478	Agricultural Waste Management	3
BAE 302	Transport Phenomena	3	BAE 481	Structures & Environment	3
BAE 305	Biological Engineering Circuits	4	BAE 488	Postharvest Engineering	3
			BAE 492	External Learning Experience	1-6
			BAE 493	Special Problems in Biological and Agricultural Engineering	1-6



BAE 495	Special Topics in Biological and Agricultural Engineering	1-3	BAE 583	Stream Corridor 3 Es: Ecohydraulics, Engineering and Ethics	
BAE 501	Sensors and Controls	3	BAE 584	Introduction to Fluvial Geomorphology	3
BAE 502	Instrumentation for Hydrologic Applications	3	BAE 585		1
BAE 525	Industrial Microbiology and Bioprocessing	3	BAE 590	Special Problems	1-6
BAE 528	Biomass to Renewable Energy Processes	3	BAE 591	Master's Research Methods I	1
BAE 535	Precision Agriculture Technology	3	BAE 592	Master's Research Methods II	1
BAE 536	GIS Applications in Precision Agriculture	1	BAE 593	Introduction to Research Communications	1
BAE 560		3	BBS 325	Introduction to Brewing Science and Technology	3
BAE 561	Agricultural Air Quality	3	BBS 426	Upstream Biomanufacturing Laboratory	2
BAE 572	Irrigation and Drainage	3	BBS 526	Upstream Biomanufacturing Laboratory	2
BAE 573	Introduction to Hydrologic and Water Quality Modeling	3	BCH 101	Introduction to Microbiology and Biochemistry Laboratory Practices	3
BAE 574	DRAINMOD: Theory and Application	3	BCH 571	Regulation of Metabolism	3
BAE 575	Design of Structural Stormwater Best Management Practices	3	BEC 220	Introduction to Drug Development and Careers in Biomanufacturing	1
BAE 576	Watershed Monitoring and Assessment	3	BEC 330	Principles and Applications of Bioseparations	2
BAE 577	Wetlands Design and Restoration	3	BEC 363	Foundations of Recombinant Microorganisms for Biomanufacturing	2
BAE 578	Agricultural Waste Management	3	BEC 426	Upstream Biomanufacturing Laboratory	2
BAE 580	Introduction to Land and Water Engineering	3	BEC 436	Introduction to Downstream Process Development	2
BAE 581	Open Channel Hydraulics for Natural Systems	3			
BAE 582	Risk and Failure Assessment of Stream Restoration Structures	1			

BEC 440	Expression Systems in Biomanufacturing 1	3	BEC 562	Fundamentals of Bio-Nanotechnology	3
BEC 441	Expression Systems in Biomanufacturing II	3	BEC 563	Fermentation of Recombinant Microorganisms	2
BEC 462	Fundamentals of Bio-Nanotechnology	3	BEC 575	Global Regulatory Affairs for Medical Products	3
BEC 463	Fermentation of Recombinant Microorganisms	2	BEC 577	Advanced Biomanufacturing and Biocatalysis	3
BEC 475	Global Regulatory Affairs for Medical Products	3	BEC 580	cGMP Fermentation Operations	2
BEC 480	cGMP Fermentation Operations	2	BEC 583	Tissue Engineering Technologies	2
BEC 483	Tissue Engineering Technologies	2	BEC 585	cGMP Downstream Operations	2
BEC 485	cGMP Downstream Operations	2	BEC 590	Industry Practicum in Biomanufacturing	3
BEC 488	Animal Cell Culture Engineering	2	BEC 595	Special Topics in Biomanufacturing	1-6
BEC 495	Special Topics in Biomanufacturing	1-4	BIO 105	Biology in the Modern World	3
BEC 497	Biomanufacturing Research Projects	1-3	BIO 106	Biology in the Modern World Laboratory	1
BEC 515	Biopharmaceutica Product Characterization Techniques	2	BIO 140	Survey of Animal Diversity	3
BEC 526	Upstream Biomanufacturing Laboratory	2	BIO 141	Animal Diversity Laboratory	1
BEC 532	Foundations of Downstream Processing and Formulation	2	BIO 165	Introduction to Environmental Research	5
BEC 536	Introduction to Downstream Process Development	2	BIO 181	Introductory Biology: Ecology, Evolution, and Biodiversity	4
BEC 540	Expression Systems in Biomanufacturing 1	3	BIO 183	Introductory Biology: Cellular and Molecular Biology	4
BEC 541	Expression Systems in Biomanufacturing II	3	BIO 227	Understanding Structural Diversity through Biological Illustration	3
			BIO 230	The Science of Studying Dinosaurs	3

BIO 240	Principles of Human Anatomy & Physiology (A): Nervous, Skeletal, Muscular, & Digestive Systems	4	BIO 481	Senior Capstone Project	1
BIO 245	Principles of Human Anatomy & Physiology (B): Endocrine, Cardiovascular, Respiratory & Renal Systems	4	BIO 482	Capstone Course in Molecular, Cellular, and Developmental Biology	3
BIO 267	Research in the Life Sciences I: Research Skills	3	BIO 483	Capstone Course in Integrative Physiology and Neurobiology	3
BIO 269	Research in the Life Sciences II: Guided Research	3	BIO 484	Capstone Course in Human Biology	3
BIO 310	Quantitative Approaches to Biological Problems	3	BIO 485	Capstone Course in Ecology, Evolution, and Conservation Biology	3
BIO 315	General Parasitology	3	BIO 488	Neurobiology	3
BIO 325	Paleontological Field Methods	4	BIO 498	Honors Project Part I	3
BIO 330	Evolutionary Biology	3	BIO 499	Honors Project Part 2	3
BIO 361	Developmental Biology	3	BIO 518	Experience and the Brain	3
BIO 370	Developmental Anatomy of the Vertebrates	3	BIO 560	Population Ecology	3
BIO 375	Developmental Anatomy Laboratory	2	BIO 570	Evolutionary Ecology	3
BIO 405	Functional Histology	3	BIO 572	Proteomics	3
BIO 414	Cell Biology	3	BIO 588	Neurobiology	3
BIO 416	Cancer Cell Biology	3	BIO 592	Topical Problems	1-3
BIO 418	Cell Biology Research Lab	2	BIT 210	Phage Hunters	3
BIO 424	Endocrinology	3	BIT 211	Phage Genomics	2
BIO 432	Evolutionary Medicine	3	BIT 463	Fermentation of Recombinant Microorganisms	2
BIO 434	Hormones and Behavior	3	BIT 466	Animal Cell Culture Techniques	2
BIO 440	The Human Animal: An Evolutionary Perspective	3	BIT 476	Applied Bioinformatics	2
BIO 444	The Biology of Love and Sex	3	BIT 481	Plant Tissue Culture and Transformation	2
			BIT 563	Fermentation of Recombinant Microorganisms	2
			BIT 566	Animal Cell Culture Techniques	2
			BIT 572	Proteomics	3
			BMA 560	Population Ecology	3
			BME 483	Tissue Engineering Technologies	2

BME 583	Tissue Engineering Technologies	2	CH 220	Introductory Organic Chemistry	3
BSC 295	Special Topics in Biological Sciences	1-6	CH 221	Organic Chemistry I	3
BSC 492	Professional Experience	1-3	CH 222	Organic Chemistry I Lab	1
BSC 493	Research Experience	1-3	CH 223	Organic Chemistry II	3
BSC 495	Special Topics in Biological Sciences	1-6	CH 224	Organic Chemistry II Lab	1
CE 435	Engineering Geology	3	CH 225	Organic Chemistry I for Students in Chemical Sciences	3
CE 479	Air Quality	3	CH 226	Organic Chemistry Laboratory I for Students in Chemical Sciences	1
CE 581	Fluid Mechanics in Natural Environments	3	CH 227	Organic Chemistry II for Students in Chemical Sciences	3
CH 100	Chemistry and Society	4	CH 228	Organic Chemistry Laboratory II for Students in Chemical Sciences	1
CH 101	Chemistry - A Molecular Science	3	CH 230	Computational Chemistry Lab I	1
CH 102	General Chemistry Laboratory	1	CH 232	Computational Chemistry Lab II	1
CH 103	General Chemistry I for Students in Chemical Sciences	3	CH 295	Special Topics in Chemistry	1-3
CH 104	General Chemistry Laboratory I for Students in Chemical Sciences	1	CH 315	Quantitative Analysis	3
CH 111	Preparatory Chemistry	3	CH 316	Quantitative Analysis Laboratory	1
CH 201	Chemistry - A Quantitative Science	3	CH 331	Introductory Physical Chemistry	4
CH 202	Quantitative Chemistry Laboratory	1	CH 335	Principles of Green Chemistry	4
CH 203	General Chemistry II for Students in Chemical Sciences	3	CH 345	Chemistry and War	3
CH 204	General Chemistry Laboratory II for Students in Chemical Sciences	1	CH 401	Systematic Inorganic Chemistry I	3
			CH 403	Systematic Inorganic Chemistry II	3

CH 415	Analytical Chemistry II	3	CS 210	Lawns and Sports Turf	3
CH 431	Physical Chemistry I	3	CS 211	Plant Genetics	3
CH 433	Physical Chemistry II	3	CS 213	Crop Science	3
CH 435	Introduction to Quantum Chemistry	3	CS 214	Crop Science Laboratory	1
CH 437	Physical Chemistry for Engineers	4	CS 216	Southern Row Crop Production - Cotton, Peanuts, and Tobacco	3
CH 441	Forensic Chemistry	3	CS 218	Southern Row Crop Production - Corn, Small Grains and Soybeans	3
CH 442	Advanced Synthetic Techniques	4	CS 224	Seeds, Biotechnology and Societies	3
CH 444	Advanced Synthetic Techniques II	4	CS 230	Introduction to Agroecology	3
CH 452	Advanced Measurement Techniques I	4	CS 312	Grassland Management for Natural Resources Conservation	3
CH 454	Advanced Measurement Techniques II	4	CS 400	Turf Cultural Systems	3
CH 463	Molecular Origins of Life	3	CS 410	Community Food Systems	3
CH 495	Special Topics in Chemistry	1-4	CS 411	Crop Ecology	3
CH 499	Undergraduate Research in Chemistry	1-3	CS 413	Plant Breeding	2
CH 563	Molecular Origins of Life	3	CS 414	Weed Science	4
CH 572	Proteomics	3	CS 415	Integrated Pest Management	3
CHE 462	Fundamentals of Bio-Nanotechnology	3	CS 418	Introduction to Regulatory Science in Agriculture	3
CHE 463	Fermentation of Recombinant Microorganisms	2	CS 424	Seed Physiology	3
CHE 488	Animal Cell Culture Engineering	2	CS 430	Advanced Agroecology	4
CHE 562	Fundamentals of Bio-Nanotechnology	3	CS 465	Turf Management Systems and Environmental Quality	3
CHE 563	Fermentation of Recombinant Microorganisms	2	CS 470	Advanced Turfgrass Pest Management	2
CHE 577	Advanced Biomanufacturing and Biocatalysis	3	CS 480	Sustainable Food Production (capstone)	1
CS 200	Introduction to Turfgrass Management	4	CS 502	Plant Disease: Methods & Diagnosis	2
			CS 518	Introduction to Regulatory Science in Agriculture	3

CS 524	Seed Physiology	3	ENT 401	Honey Bee Biology and Management	3
CS 541	Plant Breeding Methods	3	ENT 402	Forest Entomology	3
CS 565	Turf Management Systems and Environmental Quality	3	ENT 425	General Entomology	3
CS 590	Special Topics	1-6	ENT 470	Advanced Turfgrass Pest Management	2
CS 591	Special Problems	1-6	ENT 492	External Learning Experience	1-6
CSSC 290	Professional Development in Crop & Soil Sciences	1	ENT 493	Special Problems in Entomology	1-6
CSSC 490	Senior Seminar in Crop Science and Soil Science	1	ENT 495	Special Topics in Entomology	1-3
CSSC 492	Professional Internship Experience in Crop and Soil Sciences	1-3	ENT 502	Insect Diversity	4
CSSC 493	Research Experience in Crop and Soil Sciences	1-3	ENT 503	Insect Morphology and Physiology	3
CSSC 495	Special Topics in Crop and Soil Sciences	1-6	ENT 504	Professional Development for Agriculture and the Life Sciences	2
ECE 488	Systems Biology Modeling of Plant Regulation	3	ENT 506	Principles of Genetic Pest Management	3
ECE 489	Solid State Solar and Thermal Energy Harvesting	3	ENT 509	Biology of Aquatic Insects	3
ECE 588	Systems Biology Modeling of Plant Regulation	3	ENT 510	Writing Proposals in Agriculture, Biology, and Ecology	2
ECE 589	Solid State Solar and Thermal Energy Harvesting	3	ENT 520	Insect Behavior	3
ECI 424	Student Teaching in Modern Foreign Languages	12	ENT 526	Organic Agriculture: Principles and Practices	3
ENT 201	Insects and People	3	ENT 550	Fundamentals of Arthropod Management	3
ENT 203	An Introduction to the Honey Bee and Beekeeping	3	ENT 560	Techniques in Molecular Ecology and Evolution	3
ENT 207	Insects and Human Disease	3	ENT 582	Medical and Veterinary Entomology	3
ENT 212	Basic Entomology	1	ENT 591	Special Topics In Entomology	1-6
ENT 305	Introduction to Forensic Entomology	3	ES 100	Introduction to Environmental Sciences	3
			ES 111	Applications of Environmental Sciences	1
			ES 113	Earth from Space	3

ES 150	Water and the Environment	3	ET 255	Hydro, Wind, and Bioenergy Assessment	3
ES 200	Climate Change and Sustainability	3	ET 262	Renewable Energy Adoption: Barriers and Incentives	3
ES 295	Special Topics in Environmental Science	1-4	ET 293	Independent Study in Environmental Technology & Management	1-6
ES 300	Energy and Environment	3	ET 294	Independent Study in Environmental Technology & Management	1-6
ES 400	Analysis of Environmental Issues	3	ET 295	Special Topics in Environmental Technology & Management	1-6
ES 449	Human Dimensions of Natural Resources in Australia/New Zealand		ET 301	Environmental Technology Laboratory III	1
ES 450	Sustaining Natural Resources in Australia/New Zealand		ET 302	Environmental Technology Laboratory IV	1
ES 495	Special Topics in Environmental Science	1-6	ET 303	Laboratory Safety Systems and Management	1
ES 496	Environmental Science Internship	1-3	ET 310	Environmental Monitoring and Analysis	3
ES 497	Professional Development in Environmental Science	1-3	ET 320	Fundamentals of Air Pollution	3
ES 498	Research in Environmental Science	1-3	ET 330	Environmental Technology Practicum	3
ES 499	Thesis in Environmental Science	3	ET 401	Environmental Technology Laboratory V	1
ET 105	Introduction to Environmental Regulations	1	ET 455	Adaptive Management and Governance	3
ET 120	Introduction to Renewable Energy Technologies and Assessments	3	ET 460	Practice of Environmental Technology	3
ET 201	Environmental Technology Laboratory I	1	ET 493	Independent Study in Environmental Technology & Management	1-6
ET 202	Environmental Technology Laboratory II	1	ET 494	Independent Study in Environmental Technology & Management	1-6
ET 203	Pollution Prevention	1			
ET 220	Solar Photovoltaics Assessment	3			

ET 495	Special Topics in Environmental Technology & Management	1-6	FOR 330	North Carolina Forests	3
FM 425	Feed Manufacturing Technology	3	FOR 334	Operations Research Applications in Natural Resources	1
FM 426	Feed Manufacturing Technology Laboratory	1	FOR 339	Dendrology	4
FM 525	Feed Manufacturing Technology	3	FOR 350	Professional Development III: Ethical Dilemmas in Natural Resource Management	1
FM 580	Feed and Ingredient Quality Assurance	3	FOR 353	GIS and Remote Sensing for Environmental Analysis and Assessment	3
FOR 150	Critical Thinking and Data Analysis	2	FOR 374	Forest Measurement, Modeling, and Inventory	3
FOR 172	Forest System Mapping and Mensuration I	2	FOR 402	Forest Entomology	3
FOR 204	Silviculture	2	FOR 405	Forest Management	4
FOR 248	Forest History, Technology and Society	3	FOR 406	Forest Inventory, Analysis and Planning	4
FOR 250	Professional Development II: Communications in Natural Resources	1	FOR 408	Hardwood Management	3
FOR 252	Introduction to Forest Science	3	FOR 411	Forest Tree Genetics and Biology	3
FOR 260	Forest Ecology	4	FOR 414	World Forestry	3
FOR 261	Forest Communities	2	FOR 415	World Forestry Study Tour	1
FOR 264	Forest Wildlife	1	FOR 420	Watershed and Wetlands Hydrology	4
FOR 265	Fire Management	1	FOR 422	Consulting Forestry	3
FOR 273	Forest System Mapping and Mensuration II	3	FOR 430	Forest Health and Protection	3
FOR 293	Independent Study in Forest Management	1-6	FOR 434	Forest Operations and Analysis	3
FOR 294	Independent Study in Forest Management	1-6	FOR 472	Forest Soils	4
FOR 295	Special Topics in Forestry	1-6	FOR 491	Special Topics in Forestry and Related Natural Resources	1-4
FOR 303	Silvics and Forest Tree Physiology	3	FOR 493	Independent Study in Forest Management	1-6
FOR 304	Theory of Silviculture	4			
FOR 318	Forest Pathology	3			
FOR 319	Forest Economics	3			



FOR 494	Independent Study in Forest Management	1-6
FOR 501	Dendrology	3
FOR 502	Forest Measurements	1
FOR 503	Tree Physiology	1
FOR 504	The Practice of Silviculture	3
FOR 505	Forest Management	4
FOR 506	Silviculture Laboratory	1
FOR 507	Silviculture Mini Course	1
FOR 508	Hardwood Management	3
FOR 509	Forest Resource Policy	1
FOR 510	Introduction to GPS	1
FOR 513	Silviculture for Intensively Managed Plantations	3
FOR 514	Woodland Stewardship	3
FOR 519	Forest Economics	3
FOR 520	Watershed and Wetlands Hydrology	4
FOR 522	Consulting Forestry	3
FOR 531	Wildland Fire Science	3
FOR 532	Wildland Firefighter	3
FOR 534	Forest Operations and Analysis	3
FOR 540	Advanced Dendrology	3
FOR 561	Forest Communities of the Southeastern Coastal Plain	1
FOR 562	Forest Communities of the Southern Appalachians	1
FOR 565	Plant Community Ecology	4
FOR 574	Forest Mensuration and Modeling	3

FOR 575	Advanced Terrestrial Ecosystem Ecology	3
FOR 583	Tropical Forestry	3
FOR 595	Special Topics	1-6
FS 201	Introduction to Food Science	3
FS 231	Principles of Food and Bioprocess Engineering	4
FS 250	Basics of Food Safety & Quality	3
FS 290	Careers in Food and Bioprocessing Sciences	1
FS 295	Special Topics in Food Science	1-4
FS 301	Introduction to Human Nutrition	3
FS 322	Muscle Foods and Eggs	3
FS 324	Milk and Dairy Products	3
FS 325	Introduction to Brewing Science and Technology	3
FS 330	Science of Food Preparation	3
FS 352	Introduction to Microbiological Food Safety Hazards	3
FS 354	Food Sanitation	3
FS 401	Advanced Nutrition and Metabolism	3
FS 402	Chemistry of Food and Bioprocessed Materials	4
FS 403	Analytical Techniques in Food & Bioprocessing Science	4
FS 405	Food Microbiology	3
FS 406	Food Microbiology Lab	1
FS 416	Quality Control in Food and Bioprocessing	3
FS 421	Food Preservation	3

FS 426	Upstream Biomanufacturing Laboratory	2	FS 530	Post-Harvest Food Safety	3
FS 435	Food Safety Management Systems	3	FS 535	Food Safety Management Systems	3
FS 453	Food Laws and Regulations	3	FS 540	Food Safety and Public Health	3
FS 462	Postharvest Physiology	3	FS 550	Food Industry Study Tour	2
FS 471	Professionalism & Project Preparation in Food & Bioprocessing Science	1	FS 553	Food Laws and Regulations	3
FS 475	Problems and Design in Food and Bioprocessing Science	3	FS 554	Lactation, Milk, and Nutrition	3
FS 481	Research Experience in Food and Bioprocessing Sciences	3	FS 555	Exercise Nutrition	3
FS 492	Professional Internship Experience in Food Science	1-6	FS 557	Nutraceuticals and Functional Foods	3
FS 493	Research Experience in Food Science	1-6	FS 562	Postharvest Physiology	3
FS 495	Special Topics in Food Science	1-3	FS 567	Sensory Analysis of Foods	3
FS 501	Advanced Nutrition and Metabolism	3	FS 580	Professional Development and Ethics in Food Safety	1
FS 502	Chemistry of Food and Bioprocessed Materials	4	FS 591	Special Problems In Food Science	1-6
FS 505	Food Microbiology	3	FS 592	Special Research Projects in Food Science	1-6
FS 506	Food Microbiology Lab	1	FSA 520	Pre-Harvest Food Safety	3
FS 516	Quality Control in Food and Bioprocessing		FSA 530	Post-Harvest Food Safety	3
FS 520	Pre-Harvest Food Safety	3	FSA 540	Food Safety and Public Health	3
FS 521	Food Preservation	3	FSA 580	Professional Development and Ethics in Food Safety	1
FS 522	Food Packaging	3	FW 221	Conservation of Natural Resources	3
FS 526	Upstream Biomanufacturing Laboratory	2	FW 293	Independent Study in Fisheries, Wildlife, and Conservation Biology	1-6
			FW 294	Independent Study in Fisheries, Wildlife, and Conservation Biology	1-6
			FW 311	Piedmont Wildlife Ecology and Management	3

FW 312	Fisheries Techniques and Management	1	FW 494	Independent Study in Fisheries, Wildlife, and Conservation Biology	1-6
FW 313	Mountain Wildlife Ecology and Management	1	FW 495	Special Topics in Fisheries and Wildlife Science	1-3
FW 314	Coastal Ecology and Management	1	FW 511	Human Dimensions of Wildlife and Fisheries	3
FW 333	Conservation Biology in Practice	3	FW 515	Fish Physiology	3
FW 353	Wildlife Management	3	FW 544	Mammalogy	3
FW 373	Vertebrate Natural History	3	FW 553	Principles of Wildlife Science	3
FW 403	Urban Wildlife Management	3	FW 560	International Wildlife Management and Conservation	3
FW 404	Wildlife Habitat Management	3	FW 565	African Ecology and Conservation	4
FW 405	Tropical Wildlife Ecology	3	FW 586	Aquaculture	3
FW 411	Human Dimensions of Wildlife and Fisheries	3	FW 587	Aquaculture Laboratory	1
FW 415	Professional Development in Fisheries, Wildlife, and Conservation Biology	1	FW 595	Special Topics in Fisheries and Wildlife Sciences	1-6
FW 444	Mammalogy	3	GES 506	Principles of Genetic Pest Management	3
FW 445	Human Dimensions of Conservation Biology in the Bahamas	3	GIS 512	Introduction to Environmental Remote Sensing	3
FW 453	Principles of Wildlife Science	4	GIS 515	Cartographic Design	2
FW 460	International Wildlife Management and Conservation	3	GIS 530	Spatial Data Foundations	3
FW 465	African Ecology and Conservation	4	GIS 550	Geospatial Data Structures and Web Services	3
FW 492	External Learning Experience	1-6	GIS 582	Geospatial Modeling	3
FW 493	Independent Study in Fisheries, Wildlife, and Conservation Biology	1-6	GN 301	Genetics in Human Affairs	3
			GN 311	Principles of Genetics	4
			GN 312	Elementary Genetics Laboratory	1
			GN 421	Molecular Genetics	3
			GN 423	Population, Quantitative and Evolutionary Genetics	3

GN 425	Advanced Genetics Laboratory	2	HS 242	Introduction to Small Scale Landscape Design	3
GN 427	Introductory Bioinformatics	3	HS 250	Home Landscape Design: Creating Garden Spaces	3
GN 428	Introduction to Machine Learning in Biology	3	HS 252	Landscape Graphic Communication	2
GN 434	Genes and Development	3	HS 272	Landscape Design/Build	6
GN 441	Human and Biomedical Genetics	3	HS 280	Hands-On-Horticulture	3
GN 451	Genome Science	3	HS 290	Horticulture: Careers and Opportunities	1
GN 453	Personal Genomics	3	HS 301	Plant Propagation	4
GN 456	Epigenetics, Development, and Disease	3	HS 302	Gardening with Herbaceous Perennials	3
GN 461	Advanced Bioinformatics	3	HS 303	Ornamental Plant Identification I	3
GN 490	Genetics Colloquium	1	HS 304	Ornamental Plant Identification II	3
GN 496	Genetics Research Experience	3	HS 357	Landscape Grading and Drainage	4
GN 497	Genetics Teaching Experience	3	HS 400	Residential Landscaping	6
GN 521	Molecular Genetics	3	HS 410	Community Food Systems	3
GN 541	Human and Biomedical Genetics	3	HS 411	Nursery Management	3
HS 131	Fruit & Vegetable Production	3	HS 416	Planting Design	4
HS 144	Weeds & Diseases of Ornamentals	3	HS 418	Digital Media Graphic for Landscape Designers	3
HS 200	Home Horticulture	3	HS 420	Green Infrastructure	3
HS 201	The World of Horticulture: Principles and Practices	3	HS 421	Temperate-Zone Tree Fruits: Physiology and Culture	3
HS 202	Home Plant Identification	3	HS 422	Small Fruit Production	3
HS 203	Home Plant Propagation	3	HS 423	Viticulture	3
HS 204	Home Landscape Maintenance	3	HS 428	Service-Learning in Urban Agriculture Systems	1
HS 205	Home Food Production	3	HS 431	Vegetable Production	4
HS 215	Agricultural Genetics	3	HS 432	Introduction to Permaculture	3

HS 433	Public Garden Administration	3	HS 550	Environmental Nursery Production	3
HS 440	Greenhouse Management	3	HS 551	Plant Nutrition	3
HS 442	Floriculture Crop Production	3	HS 562	Postharvest Physiology	3
HS 451	Plant Nutrition	3	HS 576	Crop Physiology and Production in Controlled Environments	3
HS 462	Postharvest Physiology	3	HS 583	Advanced Floral Crop Production and Handling	3
HS 471	Landscape Ecosystem Management	4	HS 590	Special Problems in Horticultural Science	1-6
HS 475	Horticulture Entrepreneurship	3	IDS 303	Humans and the Environment	3
HS 476	Crop Physiology and Production in Controlled Environments	3	MA 315	Mathematics Methods in Atmospheric Sciences	4
HS 480	Sustainable Food Production (capstone)	1	MA 555	Introduction to Manifold Theory	3
HS 491	Sustainable Agriculture Entrepreneurship Study Abroad	3	MB 101	Introduction to Microbiology and Biochemistry Laboratory Practices	3
HS 492	Horticulture Internship	1-3	MB 103	Introductory Topics in Microbiology	1
HS 493	Research Experience in Horticultural Science	1-3	MB 180	Introduction to Microbial Bioprocessing	3
HS 494	Teaching Experience in Horticultural Science	1-3	MB 200	The Fourth Horseman: Plagues that Changed the World	3
HS 495	Experimental Courses in Horticultural Science	1-6	MB 210	Phage Hunters	3
HS 502	Plant Disease: Methods & Diagnosis	2	MB 211	Phage Genomics	2
HS 516	Planting Design	4	MB 351	General Microbiology	3
HS 520	Green Infrastructure	3	MB 352	General Microbiology Laboratory	1
HS 521	Temperate-Zone Tree Fruits: Physiology and Culture	3	MB 354	Inquiry-Guided Microbiology Lab	1
HS 523	Viticulture	3	MB 360	Scientific Inquiry in Microbiology: At the Bench	3
HS 532	Introduction to Permaculture	3	MB 405	Food Microbiology	3
HS 533	Public Garden Administration	3	MB 406	Food Microbiology Lab	1
HS 541	Plant Breeding Methods	3	MB 411	Medical Microbiology	3

MB 412	Medical Microbiology Laboratory	1	MEA 130	Introduction to Weather and Climate	3
MB 414	Microbial Metabolic Regulation	3	MEA 135	Introduction to Weather and Climate Laboratory	1
MB 420	Fundamentals of Microbial Cell Biotransformations	2	MEA 150	Environmental Issues in Water Resources	4
MB 435	Bacterial Pathogenesis	3	MEA 200	Introduction to Oceanography	3
MB 441	Immunology	3	MEA 202	Geology II: Historical	3
MB 451	Microbial Diversity	3	MEA 210	Oceanography Lab	1
MB 452	Microbial Diversity Lab	2	MEA 211	Geology II Laboratory	1
MB 455	Microbial Biotechnology	3	MEA 215	Introduction to Atmospheric Sciences	4
MB 461	Molecular Virology	3	MEA 217	Introduction to Computing in the Geosciences	3
MB 470	Emerging and Re-emerging Infectious Diseases	3	MEA 220	Marine Biology	3
MB 480	Current Issues in Microbiology	1	MEA 240	The Planets of Our Solar System	3
MB 492	External Learning Experience	1-6	MEA 250	Introduction to Coastal Environments	3
MB 501	Biology of Plant Pathogens	3	MEA 251	Introduction to Coastal Environments Laboratory	1
MB 505	Food Microbiology	3	MEA 252	Biology of Marine Mammals	3
MB 506	Food Microbiology Lab	1	MEA 300	Environmental Geology	4
MB 520	Fundamentals of Microbial Cell Biotransformations	2	MEA 312	Atmospheric Thermodynamics	4
MB 532	Soil Microbiology	4	MEA 315	Mathematics Methods in Atmospheric Sciences	4
MB 535	Bacterial Pathogenesis	3	MEA 320	Fundamentals of Air Pollution	3
MB 555	Microbial Biotechnology	3	MEA 321	Fundamentals of Air Quality and Climate Change	3
MB 575	Introduction to Mycology	4	MEA 323	Geochemistry of Natural Waters	3
MB 585	Industry Case Studies in Microbial Biotechnology	3	MEA 350	Marine Conservation Biology	3
MB 590	Topical Problems	1-3	MEA 369	Life on Earth: Principles of Paleontology	
MEA 100	Earth System Science: Exploring the Connections	4			
MEA 101	Geology I: Physical	3			
MEA 110	Geology I Laboratory	1			

MEA 409	Watershed Forensics	3	MEA 465	Geologic Field Camp	4
MEA 410	Introduction to Mineralogy and Petrology	4	MEA 466	Preparatory Course for Field Camp	1
MEA 411	Marine Sediment Transport	3	MEA 467	Marine Meteorology	3
MEA 412	Atmospheric Physics	3	MEA 469	Ecology of coastal Resources	3
MEA 415	Climate Dynamics	3	MEA 470	Introduction to Geophysics	3
MEA 421	Atmospheric Dynamics I	3	MEA 471	Exploration and Engineering Geophysics	3
MEA 422	Atmospheric Dynamics II	3	MEA 473	Principles of Chemical Oceanography	3
MEA 425	Introduction to Atmospheric Chemistry	3	MEA 476	Worldwide River and Delta Systems: Their Evolution and Human Impacts	3
MEA 440	Igneous and Metamorphic Petrology	4	MEA 479	Air Quality	3
MEA 443	Synoptic Weather Analysis and Forecasting	4	MEA 481	Geomorphology: Earth's Dynamic Surface	3
MEA 444	Mesoscale Analysis and Forecasting	4	MEA 485	Introduction to Hydrogeology	3
MEA 449	Principles of Biological Oceanography	3	MEA 488	Meteorology for Media	3
MEA 450	Introductory Sedimentology and Stratigraphy	4	MEA 493	Special Topics in MEAS	1-6
MEA 451	Structural Geology	4	MEA 495	Junior Seminar in the Marine, Earth, and Atmospheric Sciences	1
MEA 454	Marine Physical-Biological Interactions	3	MEA 498	Internship in MEAS	1-6
MEA 455	Micrometeorology	3	MEA 507	Discipline-based Education Research in the Geosciences	3
MEA 458	Introduction to Tropical Meteorology	3	MEA 510	Air Pollution Meteorology	3
MEA 459	Field Investigation of Coastal Processes	5	MEA 511	Introduction to Meteorological Remote Sensing	3
MEA 460	Principles of Physical Oceanography	3	MEA 514	Advanced Physical Meteorology	3
MEA 462	Observational Methods and Data Analysis in Marine Physics	3	MEA 515	Climate Dynamics	3
MEA 463	Fluid Physics	3	MEA 517	Fundamentals of Climate Change Science	3
MEA 464	Ocean Circulation Systems	3			

MEA 518	Adaptation to Climate Change	3	MSE 489	Solid State Solar and Thermal Energy Harvesting	3
MEA 519	Barriers to Climate Change Literacy	3	MSE 589	Solid State Solar and Thermal Energy Harvesting	3
MEA 525	Introduction to Atmospheric Chemistry	3	NE 528	Introduction to Plasma Physics and Fusion Energy	3
MEA 540	Principles of Physical Oceanography	3	NE 529	Plasma Physics and Fusion Energy II	3
MEA 549	Principles of Biological Oceanography	3	NR 219	Natural Resource Markets	3
MEA 553	Estuarine Biogeochemistry	3	NR 293	Independent Study in Natural Resources	1-6
MEA 554	Marine Physical-Biological Interactions	3	NR 294	Independent Study in Natural Resources	1-6
MEA 562	Marine Sediment Transport	3	NR 295	Special Topics in Natural Resources	1-3
MEA 570	Geological Oceanography	3	NR 300	Natural Resource Measurements	4
MEA 573	Principles of Chemical Oceanography	3	NR 301	Practicum for Professional Development I	1
MEA 574	Advanced Igneous Petrology	3	NR 303	Humans and the Environment	3
MEA 577	Electron Microprobe Analysis of Geologic Material	2	NR 350	International Sustainable Resource Use	4
MEA 579	Principles of Air Quality Engineering	3	NR 360	Internship Experience	3
MEA 580	Air Quality Modeling and Forecasting	4	NR 400	Natural Resource Management	4
MEA 581	Fluid Mechanics in Natural Environments	3	NR 406	Conservation of Biological Diversity	3
MEA 582	Geospatial Modeling	3	NR 420	Watershed and Wetlands Hydrology	4
MEA 585	Physical Hydrogeology	3	NR 421	Wetland Science and Management	3
MEA 591	Special Topics in Marine Science	1-6	NR 460	Renewable Natural Resource Management and Policy	3
MEA 592	Special Topics in Earth Sciences	1-6	NR 484	Environmental Impact Assessment	4
MEA 593	Special Topics in Atmospheric Science	1-6			
MEA 599	Regional Geology of North America	1-6			



NR 491	Special Topics in Forestry and Related Natural Resources	1-4	NTR 410	Maternal and Infant Nutrition	3
NR 493	Independent Study in Natural Resources	1-6	NTR 415	Comparative Nutrition	3
NR 494	Independent Study in Natural Resources		NTR 419	Human Nutrition and Chronic Disease	3
NR 500	Natural Resource Management	4	NTR 420	Applied Nutrition Education	3
NR 510	Military Land Sustainability	3	NTR 421	Life Cycle Nutrition	3
NR 511	Managing Natural Resources in an Arena of Conflict	3	NTR 425	Feed Manufacturing Technology	3
NR 512	Land Use Policy & Management	3	NTR 454	Lactation, Milk and Nutrition	3
NR 520	Watershed and Wetlands Hydrology	4	NTR 490	Senior Capstone Experience in Nutrition	4
NR 521	Wetland Science and Management	3	NTR 492	Professional Internship Experience in Nutrition Science	
NR 548	Historical Environments	3	NTR 493	Research Experience in Nutrition Science	
NR 554	Introduction to Data Analysis in Natural Resources	3	NTR 495	Special Topics in Nutrition	1-6
NR 560	Renewable Natural Resource Management and Policy	3	NTR 500	Principles of Human Nutrition	3
NR 571	Current Issues in Natural Resource Policy	3	NTR 501	Advanced Nutrition and Metabolism	3
NR 595	Special Topics in Natural Resources	1-6	NTR 510	Maternal and Infant Nutrition	3
NTR 210	Introduction to Community Food Security	3	NTR 515	Comparative Nutrition	3
NTR 220	Food and Culture	3	NTR 521	Life Cycle Nutrition	3
NTR 301	Introduction to Human Nutrition	3	NTR 525	Feed Manufacturing Technology	3
NTR 302	Introduction to Nutrition Research, Communication, and Careers	3	NTR 550	Applied Ruminant Nutrition	3
NTR 320	Nutrition Education	3	NTR 554	Lactation, Milk, and Nutrition	3
NTR 330	Public Health Nutrition	3	NTR 555	Exercise Nutrition	3
NTR 401	Advanced Nutrition and Metabolism	3	NTR 557	Nutraceuticals and Functional Foods	3
			NTR 561	Equine Nutrition	3
			NTR 594	Special Topics in Nutrition	1-6
			PB 103	Perspectives on Botany	1
			PB 200	Plant Life	4
			PB 205	Our Green World	3

PB 208	Agricultural Biotechnology: Issues and Implications	3	PB 559	Plant Water Relations	2
PB 213	Plants and Civilization	3	PB 564	Rare Plants of North Carolina	3
PB 215	Medicinal Plants	3	PB 570	Plant Functional Ecology	3
PB 219	Plants in Folklore, Myth, and religion	3	PB 575	Introduction to Mycology	4
PB 220	Local Flora	3	PB 580	Introduction to Plant Biotechnology	3
PB 250	Plant Biology	4	PB 588	Systems Biology Modeling of Plant Regulation	3
PB 277	Space Biology	3	PB 595	Special Topics in Plant Biology	1-6
PB 295	Special Topics in Botany	1-4	PHY 452	Comparative Reproductive Physiology and Biotechnology	3
PB 321	Introduction to Whole Plant Physiology	3	PHY 524	Comparative Endocrinology	3
PB 325	Culinary Botany	3	PHY 552	Comparative Reproductive Physiology and Biotechnology	3
PB 345	Economic Botany	3	PO 201	Poultry Science and Production	3
PB 346	Economic Botany Lab	1	PO 201A	Poultry Science and Production	3
PB 360	Ecology	4	PO 202	Poultry Science and Production Laboratory	1
PB 400	Plant Diversity and Evolution	4	PO 202A	Poultry Science and Production Laboratory	1
PB 403	Systematic Botany	4	PO 212	Poultry and People	3
PB 413	Plant Anatomy	2	PO 215	Applied Avian and Aquaculture Nutrition	3
PB 421	Plant Physiology	3	PO 290	Poultry Seminar	1
PB 445	Paleobotany	4	PO 322	Muscle Foods and Eggs	3
PB 464	Rare Plants of North Carolina	3	PO 340	Live Poultry and Poultry Product Evaluation, Grading, and Inspection	3
PB 480	Introduction to Plant Biotechnology	3	PO 404	Avian Anatomy and Physiology	4
PB 481	Plant Tissue Culture and Transformation	2	PO 406	Physiological Aspects of Poultry Management	3
PB 488	Systems Biology Modeling of Plant Regulation	3			
PB 492	External Learning Experience	1-6			
PB 493	Plant Biology Supervised Undergraduate Research Experience	1-6			
PB 495	Special Topics in Plant Biology	1-6			
PB 501	Biology of Plant Pathogens	3			
PB 503	Systematic Botany	4			
PB 513	Plant Anatomy	2			
PB 545	Paleobotany	4			

PO 407	Physiological Aspects of Poultry Management Laboratory	1	PO 533	Poultry Processing and Products	3
PO 410	Production and Management of Game Birds in Confinement	3	PO 566	Animal Cell Culture Techniques	2
PO 411	Agrosecurity	3	PO 580	Feed and Ingrdient Quality Assurance	3
PO 412	Emerging Topics in Poultry Science	3	PO 590	Special Problems in Poultry Science	1-6
PO 415	Comparative Nutrition	3	PP 144	Weeds & Diseases of Ornamentals	3
PO 421	Commercial Egg Production	3	PP 222	Kingdom of Fungi	3
PO 424	Poultry Meat Production	3	PP 318	Forest Pathology	3
PO 425	Feed Manufacturing Technology	3	PP 470	Advanced Turfgrass Pest Management	2
PO 426	Feed Manufacturing Technology Laboratory	1	PP 501	Biology of Plant Pathogens	3
PO 433	Poultry Processing and Products	3	PP 502	Plant Disease: Methods & Diagnosis	2
PO 435	Poultry Incubation & Breeding	4	PP 575	Introduction to Mycology	4
PO 466	Animal Cell Culture Techniques	2	PRT 449	Human Dimensions of Natural Resources in Australia/New Zealand	3
PO 492	External Learning Experience	1-6	PRT 450	Sustaining Natural Resources in Australia/New Zealand	3
PO 493	Special Problems in Poultry Science	1-6	PSE 335	Principles of Green Chemistry	4
PO 495	Special Topics in Poultry Science	1-3	PY 123	Stellar and Galactic Astronomy	3
PO 504	Avian Anatomy and Physiology	4	PY 124	Solar System Astronomy	3
PO 506	Physiological Aspects of Poultry Management	3	PY 125	Astronomy Laboratory	1
PO 510	Poultry Product Safety: An On-Farm Model	3	PY 131	Conceptual Physics	4
PO 515	Comparative Nutrition	3	PY 201	University Physics I	4
PO 524	Comparative Endocrinology	3	PY 202	University Physics II	4
PO 525	Feed Manufacturing Technology	3	PY 203	University Physics III	4
			PY 205	Physics for Engineers and Scientists I	3

PY 206	Physics for Engineers and Scientists I Laboratory	1	PY 501	Quantum Physics I	3
PY 208	Physics for Engineers and Scientists II	3	PY 502	Quantum Physics II	3
PY 209	Physics for Engineers and Scientists II Laboratory	1	PY 506	Nuclear and Subatomic Physics	3
PY 211	College Physics I	4	PY 507	Elementary Particle Physics	3
PY 212	College Physics II	4	PY 509	General Relativity	3
PY 251	Introduction to Scientific Computing	3	PY 511	Mechanics I	3
PY 252	Instrumental and Data Analysis for Physics	2	PY 512	Mechanics II	3
PY 299	Special Problems in Physics	1-3	PY 514	Electromagnetism I	3
PY 301	Introduction to Quantum Mechanics	3	PY 515	Electromagnetism II	3
PY 328	Stellar and Galactic Astrophysics	3	PY 516	Physical Optics	3
PY 341	Relativity, Gravitation and Cosmology	3	PY 517	Atomic and Molecular Physics	3
PY 401	Quantum Physics I	3	PY 519	Biological Physics	3
PY 402	Quantum Physics II	3	PY 525	Computational Physics	3
PY 407	Introduction to Modern Physics	3	PY 528	Introduction to Plasma Physics and Fusion Energy	3
PY 411	Mechanics I	3	PY 529	Plasma Physics and Fusion Energy II	3
PY 412	Mechanics II	3	PY 543	Astrophysics	3
PY 413	Thermal Physics	3	PY 552	Condensed Matter Physics I	3
PY 414	Electromagnetism I	3	PY 570	Polymer Physics	3
PY 415	Electromagnetism II	3	PY 581	Matter & Interactions for Teachers I	3
PY 452	Advanced Physics Laboratory	3	PY 582	Matter & Interactions for Teachers II	3
PY 489	Solid State Solar and Thermal Energy Harvesting	3	PY 589	Solid State Solar and Thermal Energy Harvesting	3
PY 495	Special Topics in Physics	1-4	PY 590	Special Topics In Physics	1-6
PY 499	Independent Research in Physics	1-6	PY 599	Special Topics in Physics	1-6
			SMT 202	Anatomy and Properties of Renewable Materials	3
			SSC 185	Land and Life	3
			SSC 200	Soil Science	3
			SSC 201	Soil Science Laboratory	1

SSC 332	Environmental Soil Microbiology	3	SSC 551	Soil Morphology, Genesis and Classification	3
SSC 341	Soil Fertility and Nutrient Management	3	SSC 562	Environmental Applications Of Soil Science	3
SSC 342	Soil and Plant Nutrient Analysis	1	SSC 570	Wetland Soils	3
SSC 410	Soil Judging for Land Evaluation	1	SSC 573	Introduction to Hydrologic and Water Quality Modeling	3
SSC 421	Role of Soils in Environmental Management	3	SSC 590	Special Problems in Soil Science	1-6
SSC 427	Biological Approaches to Sustainable Soil Systems	3	TE 570	Polymer Physics	3
SSC 428	Service-Learning in Urban Agriculture Systems	1	TOX 201	Poisons, People and the Environment	3
SSC 440	Geographic Information Systems (GIS) in Soil Science and Agriculture	3	TOX 401	Principles of Toxicology	4
SSC 442	Soil and Environmental Biogeochemistry	3	TOX 415	Environmental Toxicology and Chemistry	4
SSC 452	Soil Classification	4	TOX 501	Principles of Toxicology	4
SSC 455	Soils, Environmental Quality and Global Challenges	3	TOX 515	Environmental Toxicology	4
SSC 461	Soil Physical Properties and Plant Growth	3	TOX 595	Special Topics	1-6
SSC 462	Soil-Crop Management Systems	3	USC 291	Service Learning Program Leader Development I	1
SSC 470	Wetland Soils	3	USC 292	Service Learning Program Leader Development II	2
SSC 473	Introduction to Hydrologic and Water Quality Modeling	3	VMP 401	Poultry Diseases	4
SSC 511	Soil Physics	4	VMP 420	Disease of Farm Animals	3
SSC 521	Soil Chemistry	3	ZO 233	Human-Animal Interactions	3
SSC 532	Soil Microbiology	4	ZO 250	Animal Anatomy and Physiology	4
SSC 540	Geographic Information Systems (GIS) in Soil Science and Agriculture	3	ZO 317	Primate Ecology and Evolution	3
SSC 541	Soil Fertility	3	ZO 333	Captive Animal Biology	3
SSC 545	Remote Sensing Applications in Soil Science and Agriculture	3	ZO 350	Animal Phylogeny and Diversity	4
			ZO 402	Invertebrate Biology	4
			ZO 410	Introduction to Animal Behavior	3
			ZO 486	Capstone Course in Zoology	3
			ZO 524		3
			ZO 553	Principles Of Wildlife Science	3

ZO 582	Medical and Veterinary Entomology	3
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## Departmental Electives

Code	Title	Hours	Counts towards
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For a departmental elective, select a course from the following set of course listings with prefixes of: ARE, ACC, BUS, EC, MIE or MA 105. (Before registering for these courses students should check to make sure they have met the necessary prerequisites and that credit restrictions do not apply — e.g. credit is not allowed for both ARE 201 and either EC 201 or EC 205).

ACC 200	Introduction to Managerial Accounting	3
ACC 210	Concepts of Financial Reporting	3
ACC 220	Introduction to Managerial Accounting	3
ACC 230	Individual Income Taxation	3
ACC 280	Survey of Financial and Managerial Accounting	3
ACC 295	Special Topics in Accounting	1-6
ACC 310	Intermediate Financial Accounting I	3
ACC 311	Intermediate Financial Accounting II	3
ACC 330	An Introduction To Income Taxation	3
ACC 340	Accounting Information Systems	3
ACC 411	Business Valuation	3
ACC 420	Cost Accounting for Effective Management	3
ACC 440	Enterprise Resource Planning Systems	3

ACC 450	Auditing and Assurance Services	3
ACC 451	Internal Auditing	3
ACC 460	Governmental and Nonprofit Accounting	3
ACC 495	Special Topics in Accounting	1-6
ACC 498	Independent Study in Accounting	1-6
ACC 499	Internship in ACC	1-6
ACC 508	Advanced Commercial Law	3
ACC 510	Advanced Financial Accounting	3
ACC 519	Applied Financial Management	3
ACC 520	Advanced Management Accounting	3
ACC 530	Advanced Income Tax	3
ACC 533	Accounting and Tax Research	3
ACC 540	IT Risks and Controls	3
ACC 550	Advanced Auditing	3
ACC 560	Tools for Tax Analytics	1
ACC 561	Database Management in Tax	1
ACC 562	Forecasting Effective Tax Rates and Scenario Analysis - Introduction	1
ACC 563	Forecasting Effective Tax Rates and Scenario Analysis - Advanced Application	1
ACC 564	Project Management and Process Documentation in Tax	1
ACC 565	Visual Analytics in Tax	1

ACC 566	Database Management Applications in Tax	1	ARE 336	Introduction to Resource and Environmental Economics	3
ACC 567	Enterprise Resource Planning for Tax	1	ARE 345	Global Agribusiness Management	3
ACC 568	Analysis of Unstructured Data in Tax	1	ARE 370	Agribusiness New Venture Development	3
ACC 569	Advanced Visual Analytics in Tax	1	ARE 395	Special Topics in Agricultural and Resource Economics (300 level)	1-6
ACC 570	Data Security and Warehousing in Tax	1	ARE 404	Advanced Agribusiness Management	3
ACC 571	Enterprise Resource Planning - Advanced Applications	1	ARE 412	Advanced Agribusiness Marketing	3
ACC 588	Special Topics in Accounting	1-6	ARE 413	Applied Agribusiness Marketing	3
ARE 215	Small Business Accounting	3	ARE 415	Introduction to Commodity Futures Markets	3
ARE 260	Marketing and Risk Management in the Pork Industry	1	ARE 420	Taxation in Agriculture, Production, and Agribusiness	3
ARE 270	Principles of Agribusiness Entrepreneurship	3	ARE 425	Contracts and Organizations in Agriculture	3
ARE 295	Special Topics in Agricultural & Resource Economics (200 Level)	1-6	ARE 433	U.S. Agricultural Policy	3
ARE 301	Intermediate Microeconomics	3	ARE 444	Ethics in Agribusiness	3
ARE 303	Farm Management	3	ARE 448	International Agricultural Trade	3
ARE 304	Agribusiness Management	3	ARE 455	Agribusiness Analytics	3
ARE 306	Agricultural Law	3	ARE 470	Agribusiness Entrepreneurship Clinical Skills Development	3
ARE 309	Environmental Law & Economic Policy	3	ARE 475	Food Policy	3
ARE 311	Agricultural Markets	3	ARE 490	Career Seminar in Agriculture & Resource Economics	1
ARE 312	Agribusiness Marketing	3	ARE 492	External Learning Experience	1-6
ARE 321	Agricultural Financial Management	3	ARE 493	Special Problems/ Research Exploration	1-6
ARE 323	Agribusiness Finance	3			
ARE 332	Human Resource Management for Agribusiness	3			

ARE 494	Agribusiness Study Abroad	1-6	BUS 444	Systems Analysis and Design	3
ARE 495	Special Topics in Agricultural and Resource Economics	1-6	BUS 449	Information Technology Capstone	3
ARE 590	Special Topics in ARE	1-99	BUS 458	Analytics: From Data to Decisions	3
BUS 225	Personal Finance	3	BUS 459	Business Analytics Practicum	3
BUS 295	Special Topics in Business Management	1-6	BUS 460	Consumer Behavior	3
BUS 320	Financial Management	3	BUS 461	Channel and Retail Marketing	3
BUS 340	Information Systems Management	3	BUS 462	Marketing Research	3
BUS 350	Economics and Business Statistics	3	BUS 464	International Marketing	3
BUS 351	Predictive Analytics for Business	3	BUS 465	Traditional and Digital Brand Promotion	3
BUS 360	Marketing Methods	3	BUS 466	Personal Selling	3
BUS 370	Operations and Supply Chain Management	3	BUS 467	Product and Brand Management	3
BUS 420	Financial Management of Corporations	3	BUS 468	Marketing Strategy	3
BUS 422	Investments and Portfolio Management	3	BUS 469	Digital Marketing Practicum	3
BUS 425	Advanced Personal Financial Management	3	BUS 470	Operations Modeling and Analysis	3
BUS 426	International Financial Management	3	BUS 472	Operations Planning and Control Systems	3
BUS 428	Financial Analytics	3	BUS 473	Supply Chain Strategy	3
BUS 429	Financial Modeling	3	BUS 474	Logistics Management	3
BUS 440	Database Management	3	BUS 475	Purchasing and Supply Management	3
BUS 441	Business Data Communications and Networking	3	BUS 476	Decision Modeling and Analysis	3
BUS 442	Information Systems Development	3	BUS 479	Supply Chain Management Undergraduate Practicum	3
BUS 443	Web Development for Business Applications	3	BUS 495	Special Topics in Business Management	1-6
			BUS 498	Independent Study in Business Management	1-6



BUS 501	Strategic Management Foundations	3	FTM 482	Global Brand Management in Textiles and Apparel	3
BUS 554	Project Management	3	M 100	Personal and Professional Identity Development	1
BUS 571	High Growth Entrepreneurship	3	MA 105	Mathematics of Finance	3
BUS 585	Market Research In Textiles	3	MBA 577	Technology Entrepreneurship and Commercialization II	3
BUS 590	Special Topics In Business Management	1-6	MIE 201	Introduction to Business Processes	3
EC 202	Principles of Macroeconomics	3	MIE 295	Special Topics in MIE	1-6
EC 301	Intermediate Microeconomics	3	MIE 305	Legal and Regulatory Environment	3
EC 302	Intermediate Macroeconomics	3	MIE 306	Managing Ethics in Organizations	3
EC 305	A Closer Look at Capitalism	3	MIE 310	Introduction to Entrepreneurship	3
EC 336	Introduction to Resource and Environmental Economics	3	MIE 330	Human Resource Management	3
EC 348	Introduction to International Economics	3	MIE 335	Organizational Behavior	3
EC 351	Econometrics I	3	MIE 410	Business Opportunity Analysis	3
EC 404	Money, Financial Markets, and the Economy	3	MIE 411	Managing the Growth Venture	3
EC 410	Public Finance	3	MIE 412	Finance and Accounting for Entrepreneurs	3
EC 413	Industrial Organization	3	MIE 413	New Venture Planning	3
EC 431	Labor Economics	3	MIE 416	The Legal Dynamics of Entrepreneurship	3
EC 437		3	MIE 418	Social Entrepreneurship Practicum	3
EC 449	International Finance	3	MIE 419	Entrepreneurship Practicum	3
EC 451	Econometrics II	3	MIE 430	Teamwork in Organizations	3
EC 468	Game Theory	3	MIE 432	Labor and Employee Relations	3
EC 474	Economics of Financial Institutions and Markets	3	MIE 434	Compensation Systems	3
EC 480		3	MIE 435	Leadership and Management	3
EC 490	Research Seminar in Economics	3			
EC 495	Special Topics in Economics	1-6			
EC 498	Independent Study in Economics	1-6			
ECG 512	Law and Economics	3			

MIE 436	Training and Development	3
MIE 438	Staffing	3
MIE 439	Human Resources Practicum	3
MIE 480	Business Policy and Strategy	3
MIE 495	Special Topics in MIE	1-6
MIE 498	Independent Study in MIE	1-6
MSE 577	Technology Entrepreneurship and Commercialization II	3
PRT 406	Sports Law	3
ST 350	Economics and Business Statistics	3
TTM 585	Market Research In Textiles	3

## Semester Sequence

This is a sample.

### First Year

Fall Semester		Hours
ALS 103	Freshman Transitions and Diversity in Agriculture & Life Sciences	1
ARE 201 or EC 201	Introduction to Agricultural & Resource Economics <sup>1</sup> or Principles of Microeconomics	3
	Biology Requirement (p. 1)	4
	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> )	3
<b>Hours</b>		<b>15</b>
Spring Semester		Hours
EC 202	Principles of Macroeconomics	3
COM 110	Public Speaking	3
CS 200 or AEE 226	Introduction to Turfgrass Management or Computer Applications and Information Technology in Agricultural & Extension Ed	3
	Mathematics Requirement (p. 1)	3
	GEP Social Sciences ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-social-sciences/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-social-sciences/</a> )	3
<b>Hours</b>		<b>15</b>

### Second Year

Fall Semester		Hours
ACC 220 or ACC 210	Introduction to Managerial Accounting or Concepts of Financial Reporting	3
	Mathematics Requirement (p. 1)	3
	Science Requirement (p. 1)	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
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

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**Hours** **14**

### Spring Semester

ARE 303 or ARE 304	Farm Management or Agribusiness Management	3
ARE 306 or ARE 309	Agricultural Law or Environmental Law & Economic Policy	3
	Science Requirement (p. 1)	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
	GEP Additional Breadth ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/</a> ) (Humanities/Social Sciences/Visual and Performing Arts)	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

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**Hours** **15**

### Third Year

#### Fall Semester

ARE/EC 301	Intermediate Microeconomics	3
BUS/ST 350 or ST 311	Economics and Business Statistics or Introduction to Statistics	3
	Communication Requirement (p. 1)	3
	ARE 400 level elective (p. 3)	3
	Free Elective <sup>2</sup>	3

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**Hours** **15**

#### Spring Semester

ARE 311 or ARE 312	Agricultural Markets or Agribusiness Marketing	3
ARE 336	Introduction to Resource and Environmental Economics	3
	Free Elective <sup>2</sup>	3
	Technical Elective (p. 4)	3
	Select 3 units from either of the following:	3
	Departmental Electives (p. 30)	
	Technical Elective (p. 4)	
ARE 490	Career Seminar in Agriculture & Resource Economics	1

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**Hours** **16**

### Fourth Year

#### Fall Semester

	Select one of the following:	3
ARE 321	Agricultural Financial Management	
ARE 323	Agribusiness Finance	
BUS 320	Financial Management	
ARE 433	U.S. Agricultural Policy	3
	Technical Elective (p. 4)	3
	Select 3 units from either of the following:	3

Departmental Electives (p. 30)	
Technical Elective (p. 4)	
ARE Elective (p. 3)	3
<b>Hours</b>	<b>15</b>
<b>Spring Semester</b>	
ARE Elective (p. 3)	3
Technical Elective (p. 4)	3
Select 3 units from either of the following:	3
Departmental Electives (p. 30)	
Technical Elective (p. 4)	
ARE 400 Level Elective (p. 3)	3
Free Elective <sup>2</sup>	3
<b>Hours</b>	<b>15</b>
<b>Total Hours</b>	<b>120</b>

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

<sup>2</sup> For free electives, select courses with enough credits to meet the minimum graduation requirement of 120 total credit hours.