



AGRICULTURE EDUCATION, GRADES 9-12

EDUCATOR PREPARATION PROGRAM NAME UNIVERSITY OF MISSOURI - COLUMBIA	EDUCATOR PREPARATION PROGRAM CODE 116116
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INSTRUCTIONS

Please complete Educator Preparation Program (EPP) Name & EPP Code above. The EPP Code may be located at <https://dese.mo.gov/sites/default/files/EPP-Code-Name.pdf>

Certification Requirements:

- Course Number – List the course number(s) for the course(s) or groups of competencies that align with the specific section of the requirements. It is possible to have more than one course or group listed.
- Course Title – List the course title(s) for the course(s) or groups of competencies that align with the specific section of the requirements. It is possible to have more than one course or group listed.
- Semester Hours – List the number of semester hours for each specific section. It is possible to use decimals (to the nearest tenth) to indicate partial use of a course to meet a requirement. The total number of semester hours must meet or exceed the minimum required number of semester hours.

Email the completed cover sheet, curriculum matrix, and advising/program information to DESE.MoSPETransition@dese.mo.gov on or before the date established in the Transition Plan.

QUESTIONS: Contact Educator Preparation, 573-751-1668 or DESE.MoSPETransition@dese.mo.gov

A. Professional Requirements (Minimum of 26 semester hours)

1. Content Planning and Delivery			
	Course Number	Course Title	Semester Hours
a. Curriculum and Instructional Planning	AG_ED_LD 4320/7320	Methods of Teaching I	0.5
	AG_ED_LD 4330/7330	Methods of Teaching II	0.5
	AG_ED_LD 4087/7087	Student Teaching Seminar	1
b. Instructional Strategies and Techniques in Content Area Specialty	AG_ED_LD 4320/7320	Methods of Teaching I	1
	AG_ED_LD 4330/7330	Methods of Teaching II	0.5
	AG_ED_LD 4087/7087	Student Teaching Seminar	1
c. Assessment, Student Data, and Data-Based Decision-Making	AG_ED_LD 4320/7320	Methods of Teaching I	0.5
	AG_ED_LD 4330/7330	Methods of Teaching II	0.5
d. Strategies for Content Literacy	AG_ED_LD 4330/7330	Methods of Teaching II	0.5
e. Critical Thinking and Problem Solving	AG_ED_LD 4330/7330	Methods of Teaching II	0.5
f. English Language Learning	LTC 4460	Teaching English to Speakers of Other Languages	3
2. Individual Student Needs			
	Course Number	Course Title	Semester Hours
a. Psychological Development of the Child and Adolescent	ESC_PS 2010	Inquiry into Learning I	1
	AG_ED_LD 2270	Leadership Development in Youth Organizations	1
b. Psychology/Education of the Exceptional Child	SPC_ED 4020/7020	Teaching the Exceptional Learner	1
c. Differentiated Learning	SPC_ED 4020/7020	Teaching the Exceptional Learner	1
d. Classroom Management	ESC_PS 2010	Inquiry into Learning I	1
	SPC_ED 4020/7020	Teaching the Exceptional Learner	1
	AG_ED_LD 4330/7330	Methods of Teaching II	0.5
e. Cultural Diversity	LTC 2040	Inquiry into Schools, Community, and Society 1	3
f. Educational Psychology	ESC_PS 2010	Inquiry into Learning I	1

3. Schools and the Teaching Profession			
	Course Number	Course Title	Semester Hours
a. Consultation and Collaboration	AG_ED_LD 4995 AG_ED_LD 4087/7087	Student Teaching Internship in Agriculture Student Teaching Seminar	1 0.5
b. Legal/Ethical Aspects of Teaching	AG_ED_LD 4995 AG_ED_LD 4087/7087	Student Teaching Internship in Agriculture Student Teaching Seminar	1 0.5
4. Secondary Literacy (Minimum of six semester hours)			
	Course Number	Course Title	Semester Hours
a. Reading and Writing in the Content Area	LTC 4560/7560	Reading & Writing in the Content Area	3
b. Instructional Interventions for Students with Reading Deficits	LTC 4565	Reading and Writing in the Content Area II	3
Professional Requirements - Total Semester Hours			29
B. Field and Clinical Experiences (Minimum of ten semester hours)			
	Course Number	Course Title	Semester Hours
1. Early Field Experiences (Minimum of one semester hour with a minimum of 30 clock hours)	AG_ED_LD 2271	Early Field Experience	1
2. Mid-Level Field Experiences (Minimum of one semester hour with a minimum of 45 clock hours)	AG_ED_LD 4321 AG_ED_LD 4331	Field Experience I Field Experience II	1 1
3. Culminating Clinical Experiences (Minimum of eight semester hours with a minimum of 12 weeks in one placement)	AG_ED_LD 4995	Student Teaching Internship in Agriculture	7
Field and Clinical Experiences - Total Semester Hours			10
Agriculture Content Knowledge Area (Minimum of 53 semester hours)			
A. Agriculture Content Knowledge Area (Minimum of 30 semester hours)			
	Course Number	Course Title	Semester Hours
1. Animal Science (Minimum of three semester hours)	AN_SCI 1011 OR AN_SCI 1175 OR AN_SCI 2111(W) OR AN_SCI 2165 OR AN_SCI 2175	Animal Science OR Biology of Animal Production 2 OR Sophomore Seminar: Societal Issues Facing Animal Agriculture Introduction to Ruminant Livestock Production Introduction to Monogastric Production	3
2. Agronomy (Minimum of three semester hours)	SOIL 2100 OR PLNT_S 2100 OR PLNT_S 2110 OR PLNT_S 3270 OR PLNT_S 3275	Introduction to Soils OR Introduction to Soils OR Plants and their cultivation OR Forage Crops OR Grain Crops	3
3. Agriculture Business (Minimum of three semester hours)	ABM/AG_EC 2223 OR ABM/AG_EC 2183 OR ABM/AG_EC 3224	Agricultural Sales OR The Agricultural Marketing System OR New Products Marketing	3
4. Agriculture Economics (Minimum of three semester hours)	ABM/AG_EC 1041 OR ABM/AG_EC 1042	Applied Microeconomics OR Applied Macroeconomics	3 3
5. Agriculture Mechanics (Minimum of three semester hours)	AG_S_M 1020	Introduction to Agricultural Systems Management	3
6. Horticulture (Minimum of three semester hours)	PLNT_S 2075 OR PLNT_S 3230(W) OR PLNT_S 3260 OR PLNT_S 4365	Environmental Horticulture OR Plant Propagation OR Greenhouse Management OR Greenhouse Crops production	3-4

<p>7. Electives from above (Minimum of zero-12 semester hours)</p>	<p>ABM/AG_EC1010 ABM/AG_EC1011 ABM/AG_EC104 ABM/AG_EC 1041 ABM/AG_EC1042 ABM/AG_EC 1042 ABM/AG_EC1200 ABM/AG_EC2050 ABM/AG_EC2070 ABM/AG_EC2070W ABM/AG_EC2123 ABM/AG_EC2156 ABM/AG_EC2183 ABM/AG_EC2183W ABM/AG_EC2223 ABM/AG_EC2940 ABM/AG_EC3150 ABM/AG_EC3224 ABM/AG_EC3224W ABM/AG_EC3230 ABM/AG_EC3241 ABM/AG_EC3241W ABM/AG_EC3256 ABM/AG_EC3257 ABM/AG_EC3260 ABM/AG_EC3270 ABM/AG_EC3271 ABM/AG_EC3272 ABM/AG_EC3282 ABM/AG_EC3283 ABM/AG_EC3285 ABM/AG_EC3286 ABM/AG_EC3294 ABM/AG_EC3295 ABM/AG_EC3296 ABM/AG_EC3297 ABM/AG_EC3321 ABM/AG_EC3383 ABM/AG_EC4110 ABM/AG_EC4230 ABM/AG_EC4251 ABM/AG_EC4295 ABM/AG_EC4301 ABM/AG_EC4301H ABM/AG_EC4310 ABM/AG_EC4340 ABM/AG_EC4356 ABM/AG_EC4940 ABM/AG_EC4962 ABM/AG_EC4971 ABM/AG_EC4971W ABM/AG_EC4972 ABM/AG_EC4983 ABM/AG_EC4990 ABM/AG_EC4995 ABM/AG_EC7110 ABM/AG_EC7251 ABM/AG_EC7295 ABM/AG_EC7301 ABM/AG_EC7310 ABM/AG_EC7340 ABM/AG_EC7356 ABM/AG_EC7940 ABM/AG_EC7962 ABM/AG_EC7971 ABM/AG_EC7972 ABM/AG_EC7990 ABM/AG_EC7995 ABM/AG_EC ELEC(X) AG_S_M1002 AG_S_M1020 AG_S_M1040 AG_S_M1120 AG_S_M2002 AG_S_M2020 AG_S_M2199 AG_S_M2220</p>	<p>Introduction to Agribusiness Management Survey of Global Agribusiness Applied Microeconomics Applied Microeconomics Applied Macroeconomics Applied Macroeconomics Applied Computer Applications For the Love of Food: Global Food System Debate Environmental Economics and Policy Environmental Economics and Policy - Writing Intensive Quantitative Applications in Agricultural Economics Introduction to Environmental Law The Agricultural Marketing System The Agricultural Marketing System - Writing Intensive Agricultural Sales Practicum in Agricultural Economics International Agribusiness New Products Marketing New Products Marketing - Writing Intensive Agricultural and Rural Economic Policy Ethical Issues in Agriculture Ethical Issues in Agriculture - Writing Intensive Agribusiness and Biotechnology Law Rural and Agricultural Law General Farm Management Conservation and Use of Protected Areas International Agricultural Development International Food Trade and Policy Agribusiness Finance Fundamentals of Entrepreneurship Problems in Agricultural Economics Economics of Managerial Decision Making Agricultural Marketing and Procurement Real Money: Speculative Trading for Beginners In the Money with Options Trading Technical Trading Tactics Economic History of Agriculture Rural Entrepreneurship II In-Service Course in Agricultural Economics Understanding the Agricultural Policy Process Agricultural Prices Agricultural Risk Management Topics in Agricultural Economics Topics in Agricultural Economics Local Economic Analysis Rural Real Estate Appraisal Environmental Law and Policy Internship Opportunities Planning the Farm Business Agribusiness Management Strategy Agribusiness Management Strategy - Writing Intensive Agri-Food Business and Cooperative Management Strategic Entrepreneurship in Agri-Food Economic Analysis of Policy and Regulation Economics of Agricultural Production and Distribution In-Service Course in Agricultural Economics Agricultural Prices Agricultural Risk Management Topics in Agricultural Economics Local Economics Analysis Rural Real Estate Appraisal Environmental Law and Policy Internship Experiences in Agricultural Economics Planning the Farm Business Agribusiness Management Strategy Agri-Food Business and Cooperative Management</p>	<p>0-12</p>
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AG_S_M2320	Economic Analysis of Policy and Regulation
AG_S_M2340	Economics of Agricultural Production and Distribution
AG_S_M2360	Ag Econ Elective (Transfer)
AG_S_M3350	Topics in Agricultural Systems Management-Biological/Physical/Math
AG_S_M4020	Introduction to Agricultural Systems Management
AG_S_M4140	Physical Principles for Agricultural Applications
AG_S_M4145	Agricultural/Industrial Materials and Processes
AG_S_M4150	Topics in Agricultural Systems Management-Biological/Physical/Math
AG_S_M4220	Environmental Ethics in Agriculture
AG_S_M4225	Seminar in Professional Development
AG_S_M4320	Agricultural/Industrial Structures
AG_S_M4330	Internal Combustion Power
AG_S_M4350	Pesticide Application Equipment
AG_S_M4360	Chemical Application Systems
AG_S_M4365	Fluid Power
AG_S_M4366	Problems in Agricultural Systems Management
AG_S_M4368	Agricultural Safety and Health
AG_S_M4370	Advanced Agricultural/Industrial Materials and Processes
AG_S_M4390	Electricity: Wiring and Equipment
AG_S_M4420	Sensors and Control Systems for Agri-Industries
AG_S_M4440	Biorenewable Systems Technology
AG_S_M4460	Material Handling and Conditioning
AG_S_M4940	Preservation of Grain Quality
AG_S_M4970	Agricultural Equipment and Machinery
AG_S_M4970W	Principles for Food Processing
AG_S_M7001	Problems in Agricultural Systems Management
AG_S_M7020	Precision Agriculture Science and Technology
AG_S_M7085	Machinery Management Using Precision Agriculture Technology
AG_S_M7120	Data Management and Analysis Using Precision Agriculture Technology
AG_S_M7140	Profit Strategies Using Precision Agriculture Technology
AG_S_M7220	In-Service Course Agriculture System Management-Farm Power and Machinery
AG_S_M7320	Optimization and Management of Food and Agricultural Systems
AG_S_M7330	Surface Water Management
AG_S_M7340	Water Quality and Pollution Control
AG_S_M7360	Irrigation and Drainage
AG_S_M7365	Agricultural Systems Management Internship
AG_S_M7366	Agricultural Systems Management - Capstone
AG_S_M7368	Agricultural Systems Management - Capstone - Writing Intensive
AG_S_M7370	Topics in Agricultural Systems Management
AG_S_M7390	Agricultural Safety and Health
AG_S_M7420	Problems in Agricultural Systems Management
AG_S_M7440	Advanced Agricultural/Industrial Materials and Processes
AG_S_M7460	Electricity: Wiring and Equipment
AG_S_M8142	Material Handling and Conditioning
AG_S_M8340	Agricultural Equipment and Machinery
AG_S_M ELEC(X)	Principles for Food Processing
AN_SCI1001	Agricultural Mechanization Systems
AN_SCI1011	Precision Agriculture Science and Technology
AN_SCI1011H	Machinery Management Using Precision Agriculture Technology
AN_SCI1012	Data Management and Analysis Using Precision Agriculture Technology
AN_SCI1013	Profit Strategies Using Precision Agriculture Technology
AN_SCI1065	In-Service Course Agriculture Systems Management-Farm Power and Machinery
AN_SCI1175	Management-Farm Power and Machinery
AN_SCI2001	Management-Farm Power and Machinery
AN_SCI2045	Management-Farm Power and Machinery
AN_SCI2085	Management-Farm Power and Machinery
AN_SCI2095	Management-Farm Power and Machinery
AN_SCI2110	Management-Farm Power and Machinery
AN_SCI2111	Management-Farm Power and Machinery
AN_SCI2111W	Management-Farm Power and Machinery
AN_SCI2114	Management-Farm Power and Machinery
AN_SCI2115	Management-Farm Power and Machinery
AN_SCI2131	Management-Farm Power and Machinery
AN_SCI2135	Management-Farm Power and Machinery
AN_SCI2140	Management-Farm Power and Machinery
AN_SCI2165	Management-Farm Power and Machinery
AN_SCI2175	Management-Farm Power and Machinery
AN_SCI2195	Management-Farm Power and Machinery
AN_SCI3001	Management-Farm Power and Machinery
AN_SCI3085	Management-Farm Power and Machinery
AN_SCI3085W	Management-Farm Power and Machinery

AN_SCI3190	Optimization and Management of Food and Agriculture Systems
AN_SCI3212	Surface Water Management
AN_SCI3213	Water Quality and Pollution Control
AN_SCI3214	Irrigation and Drainage
AN_SCI3231	Agricultural Energy Efficiency
AN_SCI3232	Agricultural Mechanization Systems
AN_SCI3242	Ag Systems Management Elective (Transfer)
AN_SCI3254	Topics in Animal Science
AN_SCI3254H	Animal Science
AN_SCI3255	Animal Science - Honors
AN_SCI3275	Introduction to Captive Wild Animal Management
AN_SCI4001	Biotechnology in Animal Agriculture
AN_SCI4001W	Animal Science Laboratory Practicum
AN_SCI4010	Biology of Animal Production 2
AN_SCI4011	Topics in Animal Science
AN_SCI4312	Equine Practicum
AN_SCI4314	Problems in Animal Science
AN_SCI4314H	Equine Behavior and Training
AN_SCI4323	Global Animal Agriculture
AN_SCI4324	Sophomore Seminar: Societal Issues Facing Animal Agriculture
AN_SCI4332	Sophomore Seminar: Societal Issues Facing Animal Agriculture - Writing Intensive
AN_SCI4344	Live Animal and Meat Evaluation
AN_SCI4354	Livestock Judging
AN_SCI4384	Dairy Products Evaluation
AN_SCI4386	Horse Selection and Evaluation
AN_SCI4387	Companion Animals
AN_SCI4437	Introduction to Ruminant Livestock Production
AN_SCI4437	Introduction to Monogastric Production
AN_SCI4910	Equine Facility Management and Marketing
AN_SCI4940	Topics in Animal Science
AN_SCI4973	Problems in Animal Science
AN_SCI4975	Problems in Animal Science - Writing Intensive
AN_SCI4975W	Study Abroad: International Meat, Dairy and Enology
AN_SCI4976	Principles of Animal Nutrition
AN_SCI4976W	Genetics of Agricultural Plants and Animals
AN_SCI4977	Principles of Meat Science
AN_SCI4978W	Principles of Dairy Foods Science
AN_SCI4979	Animal Feeds and Feeding
AN_SCI7001	Principles and Applications of Animal Nutrition
AN_SCI7010	Physiology of Domestic Animals
AN_SCI7312	Physiology of Domestic Animals - Honors
AN_SCI7314	Physiology of Domestic Animals Laboratory
AN_SCI7323	Meat Animal Evaluation
AN_SCI7324	Topics in Animal Science
AN_SCI7332	Topics in Animal Science - Writing Intensive
AN_SCI7344	Pasture-Based Dairy Management
AN_SCI7354	Pasture Based Dairy Management Lab
AN_SCI7384	Monogastric Nutrition
AN_SCI7437	Physiology of Reproduction
AN_SCI7975	Physiology of Reproduction - Honors
AN_SCI7976	Applied Livestock Genetics
AN_SCI7977	Genomics of Plants and Animals
AN_SCI7978	Ruminant Nutrition
AN_SCI7979	Processing Muscle Foods
AN_SCI8085	Physiology and Biochemistry of Muscle as Food
AN_SCI8087	Reproductive Management
AN_SCI8413	Equine Reproduction
AN_SCI8414	Equine Breeding Management
AN_SCI8415	Stress Physiology
AN_SCI8420	Environmental Physiology
AN_SCI8424	Senior Seminar in Captive Wild Animal Management
AN_SCI8430	Management
AN_SCI8431	Internship in Animal Science & Technology
AN_SCI8438	Molecular and Cellular Techniques in Animal Science
AN_SCI8441	Beef Production and Management
AN_SCI8443	Beef Production and Management - Writing Intensive
AN_SCI8447	Stress Physiology
AN_SCI8450	Environmental Physiology
AN_SCI8472	Senior Seminar in Captive Wild Animal Management
AN_SCI8633	Management
AN_SCI8725	Internship in Animal Science & Technology
AN_SCI ELEC(X)	Molecular and Cellular Techniques in Animal Science
PLNT_S1002	Beef Production and Management
PLNT_S1010	Beef Production and Management - Writing Intensive
PLNT_S1020	Stress Physiology
PLNT_S1120	Dairy Production

PLNT_S1125	Dairy Production - Writing Intensive
PLNT_S2002	Horse Production
PLNT_S2075	Swine Production
PLNT_S2100	Swine Production - Writing Intensive
PLNT_S2110	Poultry Production
PLNT_S2125	Poultry Production Writing Intensive
PLNT_S2150	Topics in Animal Science
PLNT_S2195	Pasture-Based Dairy Management
PLNT_S2210	Monogastric Nutrition
PLNT_S2215	Physiology of Reproduction
PLNT_S2220	Applied Livestock Genetics
PLNT_S2221	Genomics of Plants and Animals
PLNT_S2240	Ruminant Nutrition
PLNT_S2250	Processing Muscle Foods
PLNT_S2254	Physiology and Biochemistry of Muscle as Food
PLNT_S2710	Reproductive Management
PLNT_S3110	Environmental Physiology
PLNT_S3130	Beef Production and Management
PLNT_S3210	Dairy Production
PLNT_S3213	Horse Production
PLNT_S3220	Swine Production
PLNT_S3221	Poultry Production
PLNT_S3222	Problems in Animal Science
PLNT_S3225	Seminar in Animal Science
PLNT_S3230	Reproductive Biology Seminar
PLNT_S3230W	Meat Quality
PLNT_S3240	Survey of Epigenetics
PLNT_S3250	Endocrinology
PLNT_S3252	Meat Investigations
PLNT_S3254	Introduction to Bioinformatics Programming
PLNT_S3260	Nutritional Biochemistry of Lipids
PLNT_S3270	Nutrient Regulation of Gene Expression
PLNT_S3275	Livestock Production and Management
PLNT_S3355	Research Methods
PLNT_S3385	Functional Genomics of Mammalian
PLNT_S3500	Genomes: Focus on Microarray
PLNT_S3510	Recent Advances in Environmental and
PLNT_S3710	Endocrine Physiology
PLNT_S3715	Research in Animal Science
PLNT_S4002	Amino Acid Metabolism
PLNT_S4313	Molecular and Network Evolution
PLNT_S4314	Science Outreach: Public Understanding of
PLNT_S4315	Science
PLNT_S4320	Animal Science Elective (Transfer)
PLNT_S4325	Topics In Plant Science -
PLNT_S4330	Biological/Physical/Mathematics
PLNT_S4340	Plant Science Orientation
PLNT_S4345	World Food and You
PLNT_S4350	Career Development
PLNT_S4355	People, Plants and the Environment
PLNT_S4360	Topics in Plant Science -
PLNT_S4365	Biological/Physical/Mathematics
PLNT_S4385	Environmental Horticulture
PLNT_S4400	Introduction to Soils
PLNT_S4500	Plants and their Cultivation
PLNT_S4520	Plant Structure and Function
PLNT_S4550	Plants for Interior Design
PLNT_S4710	Grapes and Wines of the World
PLNT_S4720	Ornamental Woody Plants
PLNT_S4730	Ornamental Herbaceous Plants
PLNT_S4940	Introduction to Floral Design
PLNT_S4965	Everyday Floral Design
PLNT_S4970	Landscape Graphic Communication
PLNT_S4975	Landscape Site Analysis
PLNT_S7001	Landscape Design
PLNT_S7085	Insects in the Environment
PLNT_S7087	Topics in Plant Science -
PLNT_S7313	Biological/Physical/Mathematics
PLNT_S7314	Horticultural Drainage and Irrigation Systems
PLNT_S7315	Undergraduate Seminar in Plant Science
PLNT_S7320	Principles of Weed Science
PLNT_S7325	Genetics of Agricultural Plants and Animals
PLNT_S7330	Special Occasion Floral Design
PLNT_S7345	Wedding Floral Design
PLNT_S7350	Retail Floral Management
PLNT_S7355	Plant Breeding and Genetics
PLNT_S7360	Plant Propagation

	PLNT_S7365 PLNT_S7370 PLNT_S7400 PLNT_S7500 PLNT_S7550 PLNT_S7710 PLNT_S7720 PLNT_S7730 PLNT_S7820 PLNT_S7965 PLNT_S7970 PLNT_S7975 PLNT_S8001 PLNT_S8010 PLNT_S8330 PLNT_S8362 PLNT_S8365 PLNT_S8410 PLNT_S8420 PLNT_S8430 PLNT_S8505 PLNT_S8530 PLNT_S8650 PLNT_S8720 PLNT_S ELEC(X) SOIL2100 SOIL2106 SOIL3001 SOIL3085 SOIL3290 SOIL3290W SOIL4001 SOIL4085 SOIL4305 SOIL4306 SOIL4308 SOIL4312 SOIL4313 SOIL4314 SOIL4318 SOIL4320 SOIL4360 SOIL4940 SOIL7001 SOIL7085 SOIL7305 SOIL7306 SOIL7308 SOIL7312 SOIL7313 SOIL7314 SOIL7318 SOIL7320 SOIL7360 SOIL8001 SOIL8085 SOIL8400 SOIL8500 SOIL ELEC(X)	Plant Propagation - Writing Intensive Principles of Viticulture I Green Industry Bidding Arboriculture and Pruning Landscape AutoCAD Greenhouse Management Forage Crops Grain Crops Introductory Turfgrass Management Problems in Plant Science Forest Pathology Biology of Fungi Introductory Entomology Insect Diversity Topics in Plant Science - Biological/Physical/Mathematics Soil Fertility and Plant Nutrition Soil Fertility and Plant Nutrition Laboratory Crop Physiology Molecular Plant Physiology Field Crop Breeding Plant Breeding Theory Principles of Viticulture II Principles of Viticulture and Winemaking Nursery Crop Production and Management Advanced Turfgrass Management Precision Agriculture Science and Technology Greenhouse Crops Production Problems in Plant Science Plant Anatomy Biology and Pathogenesis of Plant- Associated Microbes Environmental Microbiology Plant Biotechnology Systematic Entomology Aquatic Entomology Insect Pest Management for Plant Protection Internship in Plant Science Special Readings in Plant Pathology Readings in Molecular Ecology of Herbivory Advanced Landscape Design Topics Problems Seminar Soil Fertility and Plant Nutrition Soil Fertility and Plant Nutrition Laboratory Crop Physiology Molecular Plant Physiology Field Crop Breeding Plant Breeding Theory Principles of Viticulture and Winemaking Readings Advanced Turfgrass Management Precision Agriculture Science and Technology Greenhouse Crops Production Small Fruit and Vegetable Production Plant Anatomy Biology and Pathogenesis of Plant- Associated Microbes Plant Biotechnology Systematic Entomology Aquatic Entomology Insect Pest Management for Plant Protection Principles of Insect Physiology Readings in Plant Stress Biology Readings in Molecular Ecology of Herbivory Advanced Landscape Design Topics Professionalism and Ethics Molecular Breeding Introduction to Plant Metabolism Introduction to Molecular Cell Biology Advanced Weed Science Herbicide Mode of Action and Symptomology Introduction to Bioinformatics Programming Introduction to Plant Stress Biology	
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		Research with Plant Stress Agents Ecological and Evolutionary Genomics Insect Behavior Plant Science Elective (Transfer) Introduction to Soils Soil Science Laboratory Topics in Soil Science Problems in Soil Science Soils and the Environment Soils and the Environment - Writing Intensive Topics in Soil Science Problems in Soil Science Environmental Soil Physics Environmental Soil Physics Laboratory Soil Conservation Environmental Soil Microbiology Soil Fertility and Plant Nutrition Soil Fertility and Plant Nutrition Laboratory Environmental Soil Chemistry Genesis of Soil Landscapes Precision Agriculture Science and Technology Soil Science Internship Topics in Soil Science Problems in Soil Science Environmental Soil Physics Environmental Soil Physics Laboratory Soil Conservation Environmental Soil Microbiology Soil Fertility and Plant Nutrition Soil Fertility and Plant Nutrition Laboratory Environmental Soil Chemistry Genesis of Soil Landscape Precision Agriculture Science and Technology Topics in Soil Science Problems in Soil Science Solute Transport in the Vadose Zone Chemistry of the Vadose Zone Soil Science Elective (Transfer)	
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Agriculture Content Knowledge Area - Total Semester Hours

30-42

B. Electives from the following suggested areas: (15 semester hours)

	Course Number	Course Title	Semester Hours
1. Forestry	FOREST1102 FOREST1104 FOREST2151 FOREST2540 FOREST2541 FOREST2542 FOREST2543 FOREST2544 FOREST2545 FOREST3201 FOREST3207 FOREST3212 FOREST3212W FOREST3217 FOREST3240 FOREST3290 FOREST3300 FOREST3350 FOREST4301 FOREST4320 FOREST4320W FOREST4330 FOREST4340 FOREST4350 FOREST4360 FOREST4365 FOREST4370 FOREST4375 FOREST4380 FOREST4385 FOREST4387 FOREST4390 FOREST4940	Topics in Forestry - Biological/Physical/Mathematical Topics in Forestry - Social Science Dendrology Forest Hydrology Field Studies Forest Utilization Forest Measurement and Inventory Forest Ecology Field Studies Introduction to Silviculture and Management Forest Management Planning Topics in Forestry Forest Fire Control and Use Forest Health and Protection Forest Health and Protection - Writing Intensive Fire and Society Wood Technology Urban Forestry Problems in Forestry Special Readings in Forestry Topics in Forestry Forest Ecology Forest Ecology - Writing Intensive Practice of Silviculture Tree Physiology Forest Economics Photogrammetry, Inventory and Models Logging Systems: Operations and Analyses Wildland Fire Management Forest Stand Dynamics Forest Resource Management Agroforestry I: Theory, Practice and Adoption Agroforestry Economics and Policy	0-15

	<p>FOREST4960 FOREST7301 FOREST7320 FOREST7330 FOREST7340 FOREST7350 FOREST7360 FOREST7365 FOREST7370 FOREST7375 FOREST7380 FOREST7385 FOREST7390 FOREST8385 FOREST8390 FOREST8401 FOREST8430 FOREST8450 FOREST8460 FOREST8490 FOREST8515 FOREST8520 FOREST8530 FOREST8540 FOREST8620 FOREST8625 FOREST ELEC(X)</p>	<p>Watershed Management and Water Quality Forestry Internship Special Readings in Forestry Topics in Forestry Forest Ecology Practice of Silviculture Tree Physiology Forest Economics Photogrammetry, Inventory and Models Logging Systems: Operations and Analysis Wildland Fire Management Forest Stand Dynamics Forest Resource Management Agroforestry I: Theory, Practice and Adoption Watershed Management and Water Quality Ecological Principles of Agroforestry Physical Hydrology Topics in Forestry Applied Silviculture Forest Soils Advanced Forest Ecology Advanced Forest Management Advanced Forest Biometrics Social Forestry Ecosystem Management: The Human Dimension Tree Growth-Quality Relationships Plant-Water Relations Plant-Water Relations Laboratory Forestry Elective (Transfer)</p>	
2. Natural Resources	<p>ENV_SC1001 ENV_SC1100 ENV_SC2001 ENV_SC2002 ENV_SC3001 ENV_SC3085 ENV_SC3250 ENV_SC3290 ENV_SC3290W ENV_SC3330 ENV_SC3500 ENV_SC4001 ENV_SC4085 ENV_SC4305 ENV_SC4306 ENV_SC4312 ENV_SC4318 ENV_SC4320 ENV_SC4396 ENV_SC4940 ENV_SC7001 ENV_SC7085 ENV_SC7305 ENV_SC7306 ENV_SC7312 ENV_SC7318 ENV_SC7320 ENV_SC7396 ENV_SC8001 ENV_SC8085 ENV_SC8400 ENV_SC ELEC(X) F_W1002 F_W1012 F_W1100 F_W2002 F_W2500 F_W2600 F_W2700 F_W2900 F_W3002 F_W3085 F_W3090 F_W3200 F_W3300 F_W3350 F_W3400 F_W3500</p>	<p>Topics in Environmental Science - General Introduction to Environmental Science Topics in Environmental Science - General Topics in Environmental Science- Biological/Physical/Mathematical Topics in Environmental Science - General Problems in Environmental Science Pollutant Fate and Transport Soils and the Environment Soils and the Environment - Writing Intensive Environmental Land Use Management Pollutant Fate and Transport Topics in Environmental Science - General Problems in Environmental Science Environmental Soil Physics Environmental Soil Physics Laboratory Environmental Soil Microbiology Environmental Soil Chemistry Hydrologic and Water Quality Modeling Agroforestry for Watershed Restoration Environmental Science Internship Topics in Environmental Science Problems in Environmental Science Environmental Soil Physics Environmental Soil Physics Laboratory Environmental Soil Microbiology Environmental Soil Chemistry Hydrologic and Water Quality Modeling Agroforestry for Watershed Restoration Topics in Environmental Science Problems in Environmental Science Solute Transport in the Vadose Zone Environmental Science Elective (Transfer) Topics in Fisheries and Wildlife Introduction to Captive Wild Animal Management Introductory Zoology with Laboratory Topics in Fisheries and Wildlife- Biological/Physical/Mathematics Introduction to Genetics and Evolution for Conservation Ornithology Ichthyology Principles of Wildlife Management Topics in Fisheries and Wildlife- Biological/Physical/Mathematics Problems in Fisheries and Wildlife International Studies in Conservation</p>	0-15

	F_W3600	Aquaculture	
	F_W3660	Wildlife Damage Management	
	F_W3700	Wildlife Damage Management Lab	
	F_W3900	Water Quality and Natural Resource Management	
	F_W4002	Management	
	F_W4100	Wildlife Conservation in British Cities	
	F_W4200	Introduction to Conservation Biology	
	F_W4200W	Mammalogy	
	F_W4220	Animal Behavior	
	F_W4300	Ecology of Fishes	
	F_W4400	Topics in Fisheries and Wildlife-Biological/Physical/Mathematics	
	F_W4400W	Limnology	
	F_W4500	Urban Wildlife Conservation	
	F_W4600	Urban Wildlife Conservation - Writing Intensive	
	F_W4600W	Intensive	
	F_W4650	Human Dimensions of Fish and Wildlife Conservation	
	F_W4700	Conservation	
	F_W4700W	Fisheries Management	
		Techniques for Fisheries Management and Conservation	
	F_W4800	Conservation	
	F_W4810	Techniques for Fisheries Management and Conservation - Writing Intensive	
	F_W4880	Conservation - Writing Intensive	
	F_W4910	Animal Population Dynamics and Management	
	F_W4940	Management	
	F_W4960	Ecosystem Management	
	F_W7002	Ecosystem Management - Writing Intensive	
	F_W7100	Wildlife Management Planning	
	F_W7200	Wildlife Research and Management	
	F_W7220	Evaluation Methods	
	F_W7300	Wildlife Research and Management	
	F_W7400	Evaluation Methods - Writing Intensive	
	F_W7500	Environmental Toxicology	
	F_W7600	Wildlife Disease Ecology	
	F_W7700	Waterfowl Ecology and Management	
	F_W7800	Senior Seminar in Captive Wild Animal Management	
	F_W7810	Management	
	F_W7880	Fisheries and Wildlife Internship	
	F_W8001	Special Readings in Fisheries and Wildlife	
	F_W8085	Graduate Topics in Fisheries and Wildlife	
	F_W8087	Limnology	
	F_W8300	Urban Wildlife Conservation	
	F_W8440	Human Dimensions of Fish and Wildlife Conservation	
	F_W8450	Conservation	
	F_W8460	Fisheries Management	
	F_W8470	Techniques for Fisheries Management and Conservation	
	F_W8510	Conservation	
	F_W8520	Animal Population Dynamics and Management	
	F_W8530	Management	
	F_W8540	Ecosystem Management	
	F_W8550	Wildlife Research and Management	
	F_W8620	Techniques	
	F_W ELEC(X)	Environmental Toxicology	
	NAT_R1040	Wildlife Disease Ecology	
	NAT_R1060	Waterfowl Ecology and Management	
	NAT_R1070	Topics in Fisheries and Wildlife	
	NAT_R2002	Graduate Problems in Fisheries and Wildlife	
	NAT_R2004	Masters Seminar in Fisheries and Wildlife	
	NAT_R2080	Professional Development and Communications	
	NAT_R2160	Communications	
	NAT_R3001	Fish Ecology	
	NAT_R3110	Advanced Limnology	
	NAT_R3220	Wetland Ecology	
	NAT_R3290	Fish Bioenergetics: Concepts and Applications	
	NAT_R3290W	Applications	
	NAT_R4000	Ecology, Conservation, and Environmental Justice	
	NAT_R4001	Justice	
	NAT_R4024	Stream Ecology	
	NAT_R4320	Quantitative Fish and Wildlife Assessment	
	NAT_R4325	Wildlife Nutritional Ecology	
	NAT_R4353	Advanced Waterfowl Ecology	
	NAT_R4365	Vertebrate Behavioral Ecology	
	NAT_R4385	Fisheries and Wildlife Elective (Transfer)	
	NAT_R4940	Conservation Studies	
	NAT_R4970	Ecology and Conservation of Natural Resources	
	NAT_R7001	Resources	
	NAT_R7024	Ecology and Renewable Resource Management	
	NAT_R7320	Management	

	<p>NAT_R7325 NAT_R7353 NAT_R7365 NAT_R7385 NAT_R8001 NAT_R8290 NAT_R8395 NAT_R8448 NAT_R ELEC(X)</p>	<p>Topics in Natural Resources - Biological/Physical/Mathematical Topics in Natural Resources - Social Science Outdoor Recreation Consortium Issues in Natural Resources and the Environment Topics in Natural Resources Natural Resource Biometrics Public Relations for Natural Resource Managers Hydrologic Measurement Techniques Hydrologic Measurement Techniques - Writing Intensive Problems in Natural Resources Topics in Natural Resources Foundations of Environmental Education Hydrologic and Water Quality Modeling Introduction to Geographic Information Systems Natural Resource Policy/Administration GIS Applications Landscape Ecology and GIS Analysis I Natural Resources Internship Resource Practicum in Natural Resources Topics in Natural Resources Foundations of Environmental Education Hydrologic and Water Quality Modeling Introduction to Geographic Information Systems Natural Resource Policy/Administration GIS Applications Landscape Ecology and GIS Analysis I Topics in Natural Resources Hydrologic Measurement and Synthesis Landscape Ecology and GIS Analysis II Society and Ecosystems Research Seminar Natural Resources Elective (Transfer)</p>	
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<p>3. Agriculture Journalism</p>	<p>SCI_AG_J1160 SCI_AG_J2150 SCI_AG_J2210 SCI_AG_J2940 SCI_AG_J3201 SCI_AG_J3210 SCI_AG_J3210W SCI_AG_J3240 SCI_AG_J3385 SCI_AG_J4301 SCI_AG_J4301H SCI_AG_J4301HW SCI_AG_J4301W SCI_AG_J4410 SCI_AG_J4414 SCI_AG_J4415 SCI_AG_J4940 SCI_AG_J4970 SCI_AG_J7301 SCI_AG_J7414 SCI_AG_J ELEC(X) AG_ED_LD2220 AG_ED_LD2250 AG_ED_LD2260 AG_ED_LD2260W AG_ED_LD3010 AG_ED_LD 7350</p>	<p>Introduction to Science and Agricultural Journalism Problems in Science and Agricultural Journalism Communicating Science to the Public Internships in Science and Agricultural Journalism Topics in Science and Agricultural Journalism Fundamentals of Communications Fundamentals of Communications - Writing Intensive Communicating on the Web Problems in Science and Agricultural Journalism Topics in Science and Agricultural Journalism Topics in Science and Agricultural Journalism-Honors Topics in Science and Agricultural Journalism - Honors/Writing Intensive Topics in Science and Agricultural Journalism - Writing Intensive Readings in Science and Agricultural Journalism Field Reporting on the Food System and Environment Current Issues in Science Journalism Internships in Science and Agricultural Journalism Agriculture and the Media Senior Seminar Capstone Topics in Science and Agricultural Journalism Field Reporting on the Food System and Environment Science and Ag Journalism Elective (Transfer) Verbal Communication in Agriculture, Food and Natural Resources Introduction to Leadership Team and Organizational Leadership Team and Organizational Leadership - Writing Intensive Leadership in Today's World Inservice Course in Agricultural Education and Leadership</p>	<p>0-15</p> <p>0</p>
<p>4. Integrated Pest Management</p>			<p>0</p>

	AFNR1101 AFNR1111 AFNR1120 AFNR2120 AFNR2190 AFNR2191 AFNR2191W AFNR2192 AFNR2215 AFNR3215 AFNR3315 AFNR4001 AFNR4972 AFNR4993 AFNR7190 AFNR ELEC(X) BIOCHM1090 BIOCHM1094 BIOCHM2110 BIOCHM2112 BIOCHM2480 BIOCHM2484 BIOCHM2484H BIOCHM2484HW BIOCHM3630 BIOCHM4001 BIOCHM4120 BIOCHM4270 BIOCHM4272 BIOCHM4300 BIOCHM4376 BIOCHM4385 BIOCHM4460 BIOCHM4510 BIOCHM4940 BIOCHM4964 BIOCHM4970 BIOCHM4974 BIOCHM4974W BIOCHM ELEC(X) F_S1010 F_S1030 F_S2114 F_S2131 F_S2172 F_S2195 F_S2199 F_S3190 F_S3190H F_S3210 F_S3214 F_S3231 F_S3240 F_S3250 F_S3385 F_S4199 F_S4301 F_S4310 F_S4311 F_S4315 F_S4315W F_S4330 F_S4331 F_S4340 F_S4344 F_S4345 F_S4354 F_S4370 F_S4375 F_S4380 F_S4385 F_S4390 F_S4440 F_S4441 F_S4940 F_S4941	Special Topics in Agriculture Computing and Information Systems I Computing and Information Technology Working with Data Using Excel International Agriculture and Natural Resources International Agriculture and Natural Resources – Humanities International Agriculture and Natural Resources - Humanities - Writing Intensive International Agriculture/Natural Resources- Social Science Introduction to the Theory and Practice of Sustainable Agriculture Community Food Systems Advanced Practices in Sustainable Agriculture Topics in Agriculture-General Capstone Project in Agriculture, Food and Natural Resources Internship in Agriculture, Food and Natural Resources International Agriculture/Natural Resources AFNR Elective (Transfer) Introduction to Biochemistry Introductory Biochemistry Laboratory The Living World: Molecular Scale Biotechnology in Society Introduction to Macromolecular Structure and Function Macromolecular Techniques Laboratory Macromolecular Techniques Laboratory - Honors Macromolecular Techniques Laboratory - Honors/Writing Intensive General Biochemistry Topics in Biochemistry Medicinal Plant Science Biochemistry Biochemistry Physical Chemistry of Biological Systems Computer Assisted Sequence Analysis and Molecular Modeling Problems in Biochemistry Cancer Biology Single Molecule Biophysics Internship in Biochemistry Industrial Internship with ABC Laboratories Senior Capstone in Biochemistry Biochemistry Laboratory Biochemistry Laboratory - Writing Intensive Biochemistry Elective (Transfer) Introduction to Viticulture and Enology Food Science and Nutrition Live Animal and Meat Evaluation Dairy Products Evaluation Elements of Food Microbiology Grapes and Wines of the World Seminar in Professional Development Study Abroad: International Meat, Dairy and Enology Study Abroad: International Meat, Dairy and Enology - Honors Kitchen Chemistry Principles of Meat Science Principles of Dairy Foods Science Principles of Viticulture I Physical Principles for Food Processing Problems in Food Science Food Industry Senior Seminar Topics in Food Science Food Chemistry and Analysis Investigation of Food Properties Food Chemistry and Analysis Laboratory Food Chemistry and Analysis Laboratory - Writing Intensive Principles of Food Processing	0-15
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	<p>F_S4970 F_S4970W F_S4980 F_S7310 F_S7311 F_S7315 F_S7330 F_S7331 F_S7344 F_S7345 F_S7354 F_S7360 F_S7370 F_S7375 F_S7380 F_S7390 F_S7440 F_S7441 F_S7941 F_S7970 F_S ELEC(X)</p>	<p>Technology of Dairy Products and Ingredients Principles of Viticulture II Processing Muscle Foods Principles of Viticulture and Winemaking Physiology and Biochemistry of Muscle as Food Food Microbiology Food Microbiology Laboratory Sensory Analysis of Food and Beverages Problems in Food Science Optimization and Management of Food and Agricultural Systems Principles of Winemaking and Wine Chemical Analysis Cellar Operations and Special Vinifications Field Training Internship in Food Science Food Product Development Food Product Development - Writing Intensive Food Quality Assurance Food Chemistry and Analysis Investigation of Food Properties Food Chemistry and Analysis Laboratory Principles of Food Processing Technology of Dairy Products and Ingredients Processing Muscle Foods Principles of Viticulture and Winemaking Physiology and Biochemistry of Muscle as Food Food Quality Assurance Food Microbiology Food Microbiology Laboratory Sensory Analysis of Food and Beverages Optimization and Management of Food and Agriculture Systems Principles of Winemaking and Wine Chemical Analysis Cellar Operations and Special Vinifications Internship in Food Science Food Product Development Food Science Elective (Transfer)</p>	
Electives - Total Semester Hours			15

C. Professional Vocational Education (Minimum of eight semester hours)			
	Course Number	Course Title	Semester Hours
1. Methods of Teaching Vocational Agriculture	AG_ED_LD 4320/7320	Methods of Teaching 1	1
2. Program Planning	AG_ED_LD 2270 AG_ED_LD 4310/7310	Leadership Development in Youth Organizations Intracurricular Program Management in Agricultural Education	1 0.5
3. Developing and Supervising Occupational Experience Programs			
a. Ownership (Entrepreneurship)	AG_ED_LD 4310/7310	Intracurricular Program Management in Agricultural Education	1
b. Placement	AG_ED_LD 4310/7310	Intracurricular Program Management in Agricultural Education	1
4. Developing and Using Instructional Materials and Teaching Aids	AG_ED_LD 3320	Metal Fabrication and Laboratory Management	1
5. Supervising Student Organizations	AG_ED_LD 2270	Leadership Development in Youth Organizations	1
6. Teaching Agriculture Mechanics	AG_ED_LD 3320	Metal Fabrication and Laboratory Management	2
7. Planning and Conducting Adult Programs for Young and Adult Farmers	AG_ED_LD 4310/7310	Intracurricular Program Management in Agricultural Education	0.5
Professional Vocational Education - Total Semester Hours			9