

# Warnell School of Forestry and Natural Resources

## Professional Program Curriculum

### Natural Resource Management and Sustainability Major Program of Study

Course ID	Course Title	Hours
FANR 3000-3000L	Field Orientation, Measurements, and Sampling in Forestry and Natural Resources	4
CRSS (FANR) 3060-3060L	Soils and Hydrology	4
FANR 3200-3200L	Ecology of Natural Resources	4
(FANR 3300-3300D and FANR 3400-3400D)	Economics of Renewable Resources Society and Natural Resources	2 2
FANR 3800-3800L	Spatial Analysis of Natural Resources	3
FANR 4500S <i>or</i> FANR 4990	Senior Project <i>or</i> Senior Thesis	4
FANR 4800	Renewable Resources Policy	2
<b>Computer Programming Requirement – choose one course from:</b>		
PBIO (BINF)(FANR) 4700	Computational Plant Science	3
CSCI 1301-1301L	Introduction to Computing and Programming	4
CSCI 1360	Foundations for Informatics and Data Analytics	4
CSCI 2150-2150L	Introduction to Computational Science	4
<b>Area of Emphasis and Restricted Electives</b> (choose Water and Soil Resources or Geospatial Information Science—see following page)		<b>32</b>
<b>Professional Hours</b>		<b>60</b>
<b>Total with Regents Core</b>		<b>120</b>

## Professional Program Curriculum (continued)

### Natural Resource Management and Sustainability Major Areas of Emphasis

<b>Community Forestry and Arboriculture Area of Emphasis</b>		
Course ID	Course Title	Hours
<b>Required Courses:</b>		<b>23</b>
COFA 5000	Urban Tree Management I <i>(FORS 5005 in Fall 2018)</i>	3
COFA 5300-5300L	Community Soils & Site Development	4
COFA 5010-5010L	Urban Tree Management II	4
COFA 5500	Community Forest Management	3
COFA 4650	Community Forestry & Arboriculture Practicum	3
COFA 3900	Community Forestry & Arboriculture Internship*	3
FORS 3010 and 3010L	Dendrology and Dendrology Lab	3
<b>Community Forestry and Arboriculture Electives (choose from the list below):</b>		<b>9**</b>
AAEC 3980 or 3980E	Introduction to Agribusiness Management	3
AAEC 4040-4040L	Statistics for Agribusiness Management	4
AAEC 4980	Agribusiness Management	3
ACCT 2101 or 2101E	Principles of Accounting I	3
ACCT 2102 or 2102E	Principles of Accounting II	3
CVLE 4770	Urban Infrastructure Systems	3
ECOL 3770S	Urban Ecology	3
ECON 4010	Intermediate Microeconomics	3
ECON 4150	Environmental Economics	3
ECON 4160	Urban Economics	3
EDES 4270	Environmental Design Uses of Geographic Information Systems	3
EDES 4640	The History of Urban Planning	3
EDES(PLAN) 4650	City Planning	3
ENTO 3740-3740L	Insect Pest Management	4
ENTO 4500E/6500E	Biological Control	3
ENTO(CRSS)(PATH) 4740	Integrated Pest Management	3
ENTR 5500	Introduction to Entrepreneurship	3
FANR 4220	Foundations of Restoration Ecology	3
FANR 5620	GIS Applications for Natural Resources	3
FORS 4210	Forest Health and Protection	3
FORS 4530	Wood Properties and Utilization	3
FORS 5760	Forest Products Marketing	3
GEOG 3630	Introduction to Urban Geography	3
GEOG(CRSS) 4375	GIS Applications in Agriculture	4
GEOG 4385	Community GIS	3
GEOG 4630	Advanced Urban Geography	3
GEOG 4631	Race, Inequality, and the American City	3
GEOG 4632	Urban Social Movements	3
GEOG 4633	Urban Political Ecology	3
GEOG 4660	Urban and Regional Development	3
HIST 3170	History of American Cities	3
HORT(LAND) 3450	Residential Design	3
HORT 4030S	Sustainable Community Food Production	3
HORT 4090	Landscape Horticulture	3
HORT 4095	GPS/GIS Applications for Landscape Managers	3
HORT(CRSS) 4440-4440L	Environmental Physiology	4
JURI 4790	Land Use Planning	2-3
LAND 3410	Plants of the South	3
LAND 4120	Designing Healthy Places	3
LAND 4360	Applied Landscape Ecology	3

*elective list continues on following page*

## Professional Program Curriculum (continued)

### Natural Resource Management and Sustainability Major Areas of Emphasis

Community Forestry and Arboriculture Area of Emphasis		
Course ID	Course Title	Hours
<i>elective list continued from previous page</i>		
LAND 4370	Applied Landscape Construction	2
MGMT 3001	Principles of Management	3
POLS 4640	Urban Politics	3
POLS 4645E	Applied Civic Engagement	3
PRTM 4400	Park Management	3
PRTM 5900	Ecotourism and Sustainable Development	3
RMIN 4000	Risk Management and Insurance	3
SOCI 3320	Sociology of Urban Life	3
SPAN 3010	Spanish Conversation and Composition	3
SPAN 4150	Business Spanish	3
STAT 4210	Statistical Methods	3
WASR(FORS) 4000	Forest Soil Management	3
WASR(FORS) 4110	Forest Hydrology	4
WASR 4400-4400L	Introduction to Wetlands	3
or	other faculty mentor-approved course	

\* No more than 3 hours of COFA 3900 may count towards graduation.

\*\* Total hours for Area of Emphasis and Restricted Electives must equal 32.

## Professional Program Curriculum (continued)

### Natural Resource Management and Sustainability Major Areas of Emphasis

<b>Geospatial Information Science Area of Emphasis</b>		
Course ID	Course Title	Hours
<b>Required Courses:</b>		<b>12</b>
FANR 5620-5620L	GIS Applications for Natural Resources	3
FANR 5630	Statistical Software for Natural Resource Management	3
GEOG 4590-4590L	Programming for Geographic Information Science	3
<b>Required Option—choose one from the following:</b>		
GEOG 4350-4350L or GEOG 4460	Remote Sensing of Environment, or Field Methods in Remote Sensing	3 3
<b>Natural Resources Electives (choose from the list below):</b>		<b>10*</b>
ECOL 4050	Ichthyology	4
FANR 4800	Renewable Resources Policy	2
WILD (FISH) 3000	Introduction to Fish and Wildlife Management	2
FISH 4200, 4200L	Aquatic Biology, Aquatic Biology Lab	2, 1
FISH (WILD) 4300, 4300L	Environmental Biology of Fishes, Environmental Biology of Fishes Lab	3, 1
ECOL (FISH) 4310-4310L	Freshwater Ecosystems	4
FISH 4500, 4500L	Fish Physiology, Fish Physiology Lab	3, 1
FISH (WILD) 4520-4520L	Conservation Decision-Making	3
FISH (WILD) 4550-4550L	Sustainable Aquaculture	4
FISH (EHSC) 4600	Ecotoxicology	3
FISH 4650L	Georgia Fishes Field Study	4
FORS 3010, 3010L	Dendrology, Dendrology Lab	2, 1
FORS 4010-4010L	Silviculture	4
FORS 4210	Forest Health and Protection	3
FORS 4610-4610L	Forest Mensuration	4
FORS 4620	Timber Management	4
FORS 4700-4700L	Forest Economics	3
PRTM 3310	Humans, Nature and Environmental Awareness	3
PRTM 4400	Park Management	3
PRTM 5410-5410L	Stewardship and Protection of Natural Resources	3
PRTM 5800S	Environmental Interpretation	3
PRTM 5900	Ecotourism and Sustainable Development	3
WASR (FORS) 4110-4100L	Forest Soil Management	3
WILD (ECOL) 3580, 3580L	Vertebrate Natural History, Vertebrate Natural History Lab	3, 1
WILD 4000-4000L	Management of Wildlife Habitat	4
WILD (ECOL) 4040-4040L	Herpetology	4
WILD (BIOL) 4050, 4050L	Mammalogy, Mammalogy Lab	3, 1
WILD (ECOL) 4060-4060L	Ornithology	4
WILD 4400	Wildlife Physiology and Nutrition	3
WILD 4500	Nongame and Endangered Species Management	3
WILD 4700, 4700L	Techniques in Wildlife Population Management, Techniques Lab	2, 1
WILD (POPH) 5100	Principles and Management of Wildlife Diseases	3
WILD (CRSS) 5330-5330L	Conserving Wildlife in Agricultural Landscapes	3
WILD 5350, 5350L	Wetland Management for Wildlife, Wetland Management Lab	2, 1
WILD 5700, 5700L or	Applied Population Dynamics, Applied Population Dynamics L other faculty mentor-approved course	2, 1
<b>Geospatial Electives (choose from the list below):</b>		<b>10*</b>

*See next page for a list of pre-approved courses.*

\* Total hours for Area of Emphasis, including Natural Resources Electives and Major Electives, must equal 32.

Effective for students entering Fall 2017 and later.

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<b>Geospatial Electives (choose from the list below):</b>		<b>10*</b>
CBIO (CSCI) 4835	Introduction to Computational Biology	3
CRSS 4050	Improving Nutrient and Energy Efficiency with G.I.S.	4
EDES 4270	Environmental Design Uses of Geographic Information Systems	3
EDES 4280E	Environmental Design Uses of Geographic Information Systems	3
ENGR 3120	Spatial Data Analysis	3
ENGR 5930	GPS with Engineering and GIS Applications	3
FANR 5640-5640L	Unmanned Aerial Systems' (UAS) Role in Natural Resources Mgmt.	3
FORS 5650-5650L	Aerial Photogrammetry in Forestry	3
FORS 5670	Forestry Information Systems	3
WILD (FISH) 5750	Statistical Software for Fish and Wildlife Population Analysis	1-3
GEOG 3510-3510L	Cartography and Graphics	3
GEOG 4140	Satellite Meteorology and Climatology	3
GEOG 4330-4330L	Aerial Photographs and Image Interpretation	3
GEOG 4380-4380L	Transportation Modeling and GIS	3
GEOG 4385	Community GIS	3
GEOG 4410-4410L	Cartographic Visualization Methods	3
GEOG 4430-4430L	Advanced Image Analysis and Photogrammetry	3
GEOG 4450	Digital Image Analysis	3
GEOG 4460	Field Methods in Remote Sensing	3
GEOG 4470-4470L	Geospatial Analysis	3
GEOG 4570-4570L	Advanced Geographic Information Science	3
HORT 4095	GPS/GIS Applications for Landscape Managers	3
STAT 4360	Statistical Software Programming	3
or	other faculty mentor-approved course	

\* Total hours for Area of Emphasis, including Required Courses, Natural Resources Electives and Geospatial Electives, must equal 32.

*Students pursuing the Geospatial Information Science area of emphasis are encouraged to also enroll in the GIS Certificate Program through the Department of Geography.*

## Professional Program Curriculum (continued)

### Natural Resource Management and Sustainability Major Areas of Emphasis

<b>Water and Soil Resources Area of Emphasis</b>		
Course ID	Course Title	Hours
<b>Required Courses:</b>		<b>23</b>
PHYS 1111-1111L	Introductory Physics—Mechanics, Waves, Thermodynamics	4
CRSS 4670	Environmental Soil Chemistry	3
GEOL 4220	Hydrogeology	3
WASR(FORS) 4110-4110L	Forest Hydrology	4
<b>Required Option #1—choose one from the following:</b>		
(CRSS 4600 and 4600L) or	Soil Physics <i>and</i> Soil Physics Laboratory, <i>or</i>	4
WASR 4500	Quantitative Methods in Hydrology	3
<b>Required Option #2—choose one from the following:</b>		
GEOG 3010 or	General Geomorphology <i>or</i>	3
CRSS(GEOL) 4540-4540L	Pedology	3
<b>Required Option #3—choose one from the following:</b>		
EHSC(MIBO) 4310-4310L or	Environmental Microbiology <i>or</i>	4
ECOL(WASR) 4310-4310L or	Freshwater Ecosystems <i>or</i>	4
CRSS(MIBO) 4610-4610L	Soil Microbiology	3
<b>Water &amp; Soil Resources Electives (choose from the list below):</b>		<b>9*</b>
CRSS 2010-2010L	Crop Science	4
CRSS 3540	Soil Morphology and Interpretation	1
CRSS(GEOL) 4540-4540L	Pedology	3
CRSS 4580	Soil Erosion and Conservation	3
CRSS 4600	Soil Physics	3
CRSS 4600L	Soil Physics Laboratory	1
CRSS(MIBO) 4610-4610L	Soil Microbiology	3
CRSS(WASR) 4660	Hydrogeochemical Characterization of Environmental Field Sites	3
ECOL(WASR) 4310-4310L	Freshwater Ecosystems	4
EHSC(MIBO) 4310-4310L	Environmental Microbiology	4
EHSC 4350-4350L	Environmental Chemistry	3
EHSC 4490	Environmental Toxicology	3
EHSC 4610	Water Pollution and Human Health	3
FORS 3010	Dendrology	2
FORS 3010L	Dendrology Laboratory	1
GEOG 3010	General Geomorphology	3
GEOG 4060	Field Methods: Environmental Monitoring and Assessment	3
GEOG 4300	Introductory Spatial Analysis	3
GEOG 4330-4330L	Aerial Photographs and Image Interpretation	3
GEOG 4350	Remote Sensing of Environment	3
GEOL 3010-3010L	Earth Materials	4
GEOL 3020-3020L	Surficial and Near-Surficial Processes	4
GEOL 4110	Principles of Geochemistry	3
WASR 3000+	any WASR course numbered 3000-5999	
WASR 3900**	Water and Soil Resources Internship	1-3
WASR(FORS) 4000-4000L	Forest Soil Management	3
WASR 4500	Quantitative Methods in Hydrology	3
WASR(CRSS) 4700/4700L or	Hydrology, Geology, and Soils of Georgia other faculty mentor-approved course	3

\* Total hours for Area of Emphasis and Restricted Electives must equal 32.

\*\* No more than 3 hours of WASR 3900 may count towards graduation.

Effective for students entering Fall 2017 and later.