

# Forest Management (BS): Ecology Concentration

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

The forest management, ecology concentration, trains professionals who will work as researchers, resource managers, and practitioners in varied agencies and non-governmental firms or organizations. Not focused on commodity production, this program provides more depth in scientific examination of forest communities. Subjects upon which forest management depends include botany, chemistry, ecology, economics, entomology, forest measurements, hydrology, mapping, mathematics, plant physiology, soil science, and statistics.

Both concentrations in the forest management program include a nine-week summer practicum between the second and third years of coursework. The purpose of the practicum is to study forest measurement and management skills in the field during concentrated hands-on experiences. Seven weeks of this residential practicum occurs at George Watts Hill Forest north of Durham, North Carolina.

The Society of American Foresters accredits the North Carolina State forest management program.

## Contact

For more information examine our website (<https://cnr.ncsu.edu/fer/>) or contact one of the following:

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### Department of Forestry and Environmental Resources

Box 8008  
North Carolina State University  
Raleigh, North Carolina 27695-8008

## Plan Requirements

First Year	Hours
ENV 101 Exploring the Environment	2
ENV 100 Student Success in Environmental First Year	1
PB 200 Plant Life or BIO 181 or Introductory Biology: Ecology, Evolution, and Biodiversity	4
MA 114 Introduction to Finite Mathematics with Applications	3
CH 101 Chemistry - A Molecular Science & CH 102 and General Chemistry Laboratory	4
ST 311 Introduction to Statistics	3
FOR 150 Critical Thinking and Data Analysis <sup>1</sup>	2
Acad Writing Research (p. 2) <sup>1</sup>	4
<b>Hours</b>	<b>23</b>

Second Year	Hours
Chemistry or Physics Elective (p. 2)	4
FOR 172 Forest System Mapping and Mensuration I <sup>1</sup>	2
FOR 339 Dendrology <sup>1</sup>	4
ST 312 Introduction to Statistics II	3
Economics Elective (p. 2)	3
FOR 260 Forest Ecology <sup>1</sup>	4
FOR 250 Professional Development II: Communications in Natural Resources <sup>1</sup>	1
Soil Science & Lab (p. 2)	4
MA 121 Elements of Calculus or MA 131 or Calculus for Life and Management Sciences A	3
Technical Electives (p. 2)	3
<b>Hours</b>	<b>31</b>

Summer	Hours
FOR 204 Silviculture <sup>1</sup>	2
FOR 261 Forest Communities	2
FOR 264 Forest Wildlife <sup>1</sup>	1
FOR 265 Fire Management <sup>1</sup>	1
FOR 273 Forest System Mapping and Mensuration II <sup>1</sup>	3
<b>Hours</b>	<b>9</b>

Third Year	Hours
FOR 303 Silvics and Forest Tree Physiology <sup>1</sup>	3
FOR 374 Forest Measurement, Modeling, and Inventory <sup>1</sup>	3
PB 220 Local Flora	3
NR 301 Practicum for Professional Development I	1
Advanced Communication Elective (p. 14)	3
Spatial Technology Elective (p. 14)	3
FOR 350 Professional Development III: Ethical Dilemmas in Natural Resource Management <sup>1</sup>	1
FOR 304 Theory of Silviculture <sup>1</sup>	4
Technical Electives (p. 2)	4
<b>Hours</b>	<b>25</b>

Fourth Year	Hours
FW 404 Wildlife Habitat Management	3
NR 460 Renewable Natural Resource Management and Policy <sup>1</sup>	3
FOR 430 Forest Health and Protection <sup>1</sup>	3
Technical Electives (p. 2)	4
Capstone Elective (p. 14)	4
Technical Electives (p. 2)	3
Technical Electives (p. 2)	4
<b>Hours</b>	<b>24</b>
<b>Total Hours</b>	<b>112</b>

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

Code	Title	Hours	Counts towards
<b>GEP Courses</b>			
	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 Health and Exercise Studies ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/</a> )	2	
	GEP US Diversity, Equity, and Inclusion ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-usdei/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-usdei/</a> )	3	
	GEP Interdisciplinary Perspectives ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-interdisciplinary-perspectives/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-interdisciplinary-perspectives/</a> )	5	
	GEP Global Knowledge ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-global-knowledge/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-global-knowledge/</a> ) (verify requirement)		
	Foreign Language Proficiency ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/foreign-language-proficiency/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/foreign-language-proficiency/</a> ) Foreign (verify requirement)		
<b>Total Hours</b>		<b>16</b>	

## Acad Writing Research

Code	Title	Hours	Counts towards
<b>Acad Writing Research</b>			
ENG 101	Academic Writing and Research	4	
FLE 101	Academic Writing and Research	4	
<b>Transfer Sequence</b>			
ENG 202	Disciplinary Perspectives in Writing	3	
ENG 1GEP	100 Level English Composition	3	

## Chemistry or Physics Electives

Code	Title	Hours	Counts towards
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	
PY 131	Conceptual Physics	4	
PY 211	College Physics I	4	

## Economics Electives

Code	Title	Hours	Counts towards
ARE 201	Introduction to Agricultural & Resource Economics	3	
ARE 201A	Introduction to Agricultural & Resource Economics	3	
EC 201	Principles of Microeconomics	3	
EC 205	Fundamentals of Economics	3	
NR 219	Natural Resource Markets	3	

## Soil and Science Labs

Code	Title	Hours	Counts towards
FOR 472	Forest Soils	4	
NR 460	Renewable Natural Resource Management and Policy	3	
NR 560	Renewable Natural Resource Management and Policy	3	
SSC 200	Soil Science	3	
SSC 201	Soil Science Laboratory	1	

## Technical Electives

Code	Title	Hours	Counts towards
<b>FOR/FW/NR Technical Electives</b>			
AEC 420	Introduction to Fisheries Science	3	
AEC 423	Introduction to Fisheries Sciences Laboratory	1	
ENT 402	Forest Entomology	3	
FOR 204	Silviculture	2	

FOR 248	Forest History, Technology and Society	3	FOR 405	Forest Management	4
FOR 250	Professional Development II: Communications in Natural Resources	1	FOR 406	Forest Inventory, Analysis and Planning	4
FOR 252	Introduction to Forest Science	3	FOR 408	Hardwood Management	3
FOR 260	Forest Ecology	4	FOR 411	Forest Tree Genetics and Biology	3
FOR 261	Forest Communities	2	FOR 414	World Forestry	3
FOR 264	Forest Wildlife	1	FOR 415	World Forestry Study Tour	1
FOR 265	Fire Management	1	FOR 420	Watershed and Wetlands Hydrology	4
FOR 273	Forest System Mapping and Mensuration II	3	FOR 422	Consulting Forestry	3
FOR 293	Independent Study in Forest Management	1-6	FOR 430	Forest Health and Protection	3
FOR 294	Independent Study in Forest Management	1-6	FOR 434	Forest Operations and Analysis	3
FOR 295	Special Topics in Forestry	1-6	FOR 472	Forest Soils	4
FOR 303	Silvics and Forest Tree Physiology	3	FOR 491	Special Topics in Forestry and Related Natural Resources	1-4
FOR 304	Theory of Silviculture	4	FOR 493	Independent Study in Forest Management	1-6
FOR 318	Forest Pathology	3	FOR 494	Independent Study in Forest Management	1-6
FOR 319	Forest Economics	3	FOR 505	Forest Management	4
FOR 330	North Carolina Forests	3	FOR 508	Hardwood Management	3
FOR 334	Operations Research Applications in Natural Resources	1	FOR 520	Watershed and Wetlands Hydrology	4
FOR 339	Dendrology	4	FOR 522	Consulting Forestry	3
FOR 350	Professional Development III: Ethical Dilemmas in Natural Resource Management	1	FOR 534	Forest Operations and Analysis	3
FOR 353	GIS and Remote Sensing for Environmental Analysis and Assessment	3	FW 221	Conservation of Natural Resources	3
FOR 374	Forest Measurement, Modeling, and Inventory	3	FW 293	Independent Study in Fisheries, Wildlife, and Conservation Biology	1-6
FOR 402	Forest Entomology	3			

FW 294	Independent Study in Fisheries, Wildlife, and Conservation Biology	1-6	FW 493	Independent Study in Fisheries, Wildlife, and Conservation Biology	1-6
FW 311	Piedmont Wildlife Ecology and Management	3	FW 494	Independent Study in Fisheries, Wildlife, and Conservation Biology	1-6
FW 312	Fisheries Techniques and Management	1	FW 495	Special Topics in Fisheries and Wildlife Science	1-3
FW 313	Mountain Wildlife Ecology and Management	1	FW 511	Human Dimensions of Wildlife and Fisheries	3
FW 314	Coastal Ecology and Management	1	FW 544	Mammalogy	3
FW 333	Conservation Biology in Practice	3	FW 560	International Wildlife Management and Conservation	3
FW 353	Wildlife Management	3	FW 565	African Ecology and Conservation	4
FW 373	Vertebrate Natural History	3	IDS 303	Humans and the Environment	3
FW 403	Urban Wildlife Management	3	NR 219	Natural Resource Markets	3
FW 404	Wildlife Habitat Management	3	NR 293	Independent Study in Natural Resources	1-6
FW 405	Tropical Wildlife Ecology	3	NR 294	Independent Study in Natural Resources	1-6
FW 411	Human Dimensions of Wildlife and Fisheries	3	NR 295	Special Topics in Natural Resources	1-3
FW 415	Professional Development in Fisheries, Wildlife, and Conservation Biology	1	NR 300	Natural Resource Measurements	4
FW 444	Mammalogy	3	NR 301	Practicum for Professional Development I	1
FW 445	Human Dimensions of Conservation Biology in the Bahamas	3	NR 303	Humans and the Environment	3
FW 453	Principles of Wildlife Science	4	NR 350	International Sustainable Resource Use	4
FW 460	International Wildlife Management and Conservation	3	NR 360	Internship Experience	3
FW 465	African Ecology and Conservation	4	NR 400	Natural Resource Management	4
FW 492	External Learning Experience	1-6	NR 406	Conservation of Biological Diversity	3

NR 420	Watershed and Wetlands Hydrology	4
NR 421	Wetland Science and Management	3
NR 460	Renewable Natural Resource Management and Policy	3
NR 484	Environmental Impact Assessment	4
NR 491	Special Topics in Forestry and Related Natural Resources	1-4
NR 493	Independent Study in Natural Resources	1-6
NR 494	Independent Study in Natural Resources	1-6
NR 500	Natural Resource Management	4
NR 520	Watershed and Wetlands Hydrology	4
NR 521	Wetland Science and Management	3
NR 560	Renewable Natural Resource Management and Policy	3
PP 318	Forest Pathology	3
SMT 202	Anatomy and Properties of Renewable Materials	3
<b>Technical Electives-Other</b>		
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
AEC 360	Ecology	4
AEE 208	Agricultural Biotechnology: Issues and Implications	3
BAET 323	Water Management	3
ANS 208	Agricultural Biotechnology: Issues and Implications	3
ANS 215	Agricultural Genetics	3
ARE 201	Introduction to Agricultural & Resource Economics	3
ARE 201A	Introduction to Agricultural & Resource Economics	3
ARE 215	Small Business Accounting	3

ARE 260	Marketing and Risk Management in the Pork Industry	1	ARE 415	Introduction to Commodity Futures Markets	3
ARE 270	Principles of Agribusiness Entrepreneurship	3	ARE 420	Taxation in Agriculture, Production, and Agribusiness	3
ARE 295	Special Topics in Agricultural & Resource Economics (200 Level)	1-6	ARE 425	Contracts and Organizations in Agriculture	3
ARE 301	Intermediate Microeconomics	3	ARE 433	U.S. Agricultural Policy	3
ARE 303	Farm Management	3	ARE 444	Ethics in Agribusiness	3
ARE 304	Agribusiness Management	3	ARE 448	International Agricultural Trade	3
ARE 306	Agricultural Law	3	ARE 455	Agribusiness Analytics	3
ARE 309	Environmental Law & Economic Policy	3	ARE 470	Agribusiness Entrepreneurship Clinical Skills Development	3
ARE 311	Agricultural Markets	3	ARE 475	Food Policy	3
ARE 312	Agribusiness Marketing	3	ARE 490	Career Seminar in Agriculture & Resource Economics	1
ARE 321	Agricultural Financial Management	3	ARE 492	External Learning Experience	1-6
ARE 323	Agribusiness Finance	3	ARE 493	Special Problems/ Research Exploration	1-6
ARE 332	Human Resource Management for Agribusiness	3	ARE 494	Agribusiness Study Abroad	1-6
ARE 336	Introduction to Resource and Environmental Economics	3	ARE 495	Special Topics in Agricultural and Resource Economics	1-6
ARE 345	Global Agribusiness Management	3	BAE 435	Precision Agriculture Technology	3
ARE 370	Agribusiness New Venture Development	3	BAE 473	Introduction to Hydrologic and Water Quality Modeling	3
ARE 395	Special Topics in Agricultural and Resource Economics (300 level)	1-6	BAE 535	Precision Agriculture Technology	3
ARE 404	Advanced Agribusiness Management	3	BAE 573	Introduction to Hydrologic and Water Quality Modeling	3
ARE 412	Advanced Agribusiness Marketing	3	BIO 330	Evolutionary Biology	3
ARE 413	Applied Agribusiness Marketing	3	BIO 414	Cell Biology	3
			BIT 476	Applied Bioinformatics	2

BIT 481	Plant Tissue Culture and Transformation	2	EC 451	Econometrics II	3
BUS 350	Economics and Business Statistics	3	EC 468	Game Theory	3
CS 410	Community Food Systems	3	EC 474	Economics of Financial Institutions and Markets	3
CS 470	Advanced Turfgrass Pest Management	2	EC 480		3
CS 480	Sustainable Food Production (capstone)	1	EC 490	Research Seminar in Economics	3
CSC 416	Introduction to Combinatorics	3	EC 495	Special Topics in Economics	1-6
CSC 427	Introduction to Numerical Analysis I	3	EC 498	Independent Study in Economics	1-6
CSC 428	Introduction to Numerical Analysis II	3	ECE 488	Systems Biology Modeling of Plant Regulation	3
CSC 442	Introduction to Data Science	3	ECE 588	Systems Biology Modeling of Plant Regulation	3
CSSC 490	Senior Seminar in Crop Science and Soil Science	1	ENT 201	Insects and People	3
EC 201	Principles of Microeconomics	3	ENT 203	An Introduction to the Honey Bee and Beekeeping	3
EC 202	Principles of Macroeconomics	3	ENT 207	Insects and Human Disease	3
EC 205	Fundamentals of Economics	3	ENT 212	Basic Entomology	1
EC 301	Intermediate Microeconomics	3	ENT 305	Introduction to Forensic Entomology	3
EC 302	Intermediate Macroeconomics	3	ENT 401	Honey Bee Biology and Management	3
EC 305	A Closer Look at Capitalism	3	ENT 402	Forest Entomology	3
EC 336	Introduction to Resource and Environmental Economics	3	ENT 425	General Entomology	3
EC 348	Introduction to International Economics	3	ENT 470	Advanced Turfgrass Pest Management	2
EC 351	Econometrics I	3	ENT 492	External Learning Experience	1-6
EC 404	Money, Financial Markets, and the Economy	3	ENT 493	Special Problems in Entomology	1-6
EC 410	Public Finance	3	ENT 495	Special Topics in Entomology	1-3
EC 413	Industrial Organization	3	ET 201	Environmental Technology Laboratory I	1
EC 431	Labor Economics	3	ET 202	Environmental Technology Laboratory II	1
EC 437		3	ET 203	Pollution Prevention	1
EC 449	International Finance	3			

ET 220	Solar Photovoltaics Assessment	3	ET 494	Independent Study in Environmental Technology & Management	1-6
ET 255	Hydro, Wind, and Bioenergy Assessment	3	ET 495	Special Topics in Environmental Technology & Management	1-6
ET 262	Renewable Energy Adoption: Barriers and Incentives	3	FOR 318	Forest Pathology	3
ET 293	Independent Study in Environmental Technology & Management	1-6	FOR 402	Forest Entomology	3
ET 294	Independent Study in Environmental Technology & Management	1-6	FS 462	Postharvest Physiology	3
ET 295	Special Topics in Environmental Technology & Management	1-6	FS 562	Postharvest Physiology	3
ET 301	Environmental Technology Laboratory III	1	GIS 205	Spatial Thinking with GIS	3
ET 302	Environmental Technology Laboratory IV	1	GIS 280	Introduction to GIS	3
ET 303	Laboratory Safety Systems and Management	1	GIS 295	Special Topics in Geospatial Information Science	1-4
ET 310	Environmental Monitoring and Analysis	3	GIS 510	Fundamentals of Geospatial Information Science and Technology	3
ET 320	Fundamentals of Air Pollution	3	GPH 404	Epidemiology and Statistics in Global Public Health	3
ET 330	Environmental Technology Practicum	3	HS 200	Home Horticulture	3
ET 401	Environmental Technology Laboratory V	1	HS 201	The World of Horticulture: Principles and Practices	3
ET 455	Adaptive Management and Governance	3	HS 202	Home Plant Identification	3
ET 460	Practice of Environmental Technology	3	HS 203	Home Plant Propagation	3
ET 493	Independent Study in Environmental Technology & Management	1-6	HS 204	Home Landscape Maintenance	3
			HS 205	Home Food Production	3
			HS 215	Agricultural Genetics	3
			HS 242	Introduction to Small Scale Landscape Design	3
			HS 250	Home Landscape Design: Creating Garden Spaces	3



HS 252	Landscape Graphic Communication	2	HS 462	Postharvest Physiology	3
HS 272	Landscape Design/Build	6	HS 471	Landscape Ecosystem Management	4
HS 280	Hands-On-Horticulture	3	HS 475	Horticulture Entrepreneurship	3
HS 290	Horticulture: Careers and Opportunities	1	HS 476	Crop Physiology and Production in Controlled Environments	3
HS 301	Plant Propagation	4	HS 480	Sustainable Food Production (capstone)	1
HS 302	Gardening with Herbaceous Perennials	3	HS 491	Sustainable Agriculture Entrepreneurship Study Abroad	3
HS 303	Ornamental Plant Identification I	3	HS 492	Horticulture Internship	1-3
HS 304	Ornamental Plant Identification II	3	HS 493	Research Experience in Horticultural Science	1-3
HS 357	Landscape Grading and Drainage	4	HS 494	Teaching Experience in Horticultural Science	1-3
HS 400	Residential Landscaping	6	HS 495	Experimental Courses in Horticultural Science	1-6
HS 410	Community Food Systems	3	HS 516	Planting Design	4
HS 411	Nursery Management	3	HS 520	Green Infrastructure	3
HS 416	Planting Design	4	HS 521	Temperate-Zone Tree Fruits: Physiology and Culture	3
HS 418	Digital Media Graphic for Landscape Designers	3	HS 523	Viticulture	3
HS 420	Green Infrastructure	3	HS 532	Introduction to Permaculture	3
HS 421	Temperate-Zone Tree Fruits: Physiology and Culture	3	HS 533	Public Garden Administration	3
HS 422	Small Fruit Production	3	HS 551	Plant Nutrition	3
HS 423	Viticulture	3	HS 562	Postharvest Physiology	3
HS 428	Service-Learning in Urban Agriculture Systems	1	HS 576	Crop Physiology and Production in Controlled Environments	3
HS 431	Vegetable Production	4	LOG 335	Symbolic Logic	3
HS 432	Introduction to Permaculture	3	MA 205		3
HS 433	Public Garden Administration	3	MA 225	Foundations of Advanced Mathematics	3
HS 440	Greenhouse Management	3			
HS 442	Floriculture Crop Production	3			
HS 451	Plant Nutrition	3			

MA 231	Calculus for Life and Management Sciences B	3	MA 425	Mathematical Analysis I	3
MA 241	Calculus II	4	MA 426	Mathematical Analysis II	3
MA 242	Calculus III	4	MA 427	Introduction to Numerical Analysis I	3
MA 302	Numerical Applications to Differential Equations	1	MA 428	Introduction to Numerical Analysis II	3
MA 303	Linear Analysis	3	MA 430	Mathematical Models in the Physical Sciences	3
MA 305	Introductory Linear Algebra and Matrices	3	MA 432	Mathematical Models in Life Sciences	3
MA 315	Mathematics Methods in Atmospheric Sciences	4	MA 437	Applications of Algebra	3
MA 325	Introduction to Applied Mathematics	3	MA 440		3
MA 331	Differential Equations for the Life Sciences	3	MA 444	Problem Solving Strategies for Competitions	1
MA 335	Symbolic Logic	3	MA 450	Methods of Applied Mathematics I	3
MA 341	Applied Differential Equations I	3	MA 451	Methods of Applied Mathematics II	3
MA 351	Introduction to Discrete Mathematical Models	3	MA 491	Reading in Honors Mathematics	1-6
MA 401	Applied Differential Equations II	3	MA 493	Special Topics in Mathematics	1-6
MA 402	Mathematics of Scientific Computing	3	MA 494	Major Paper in Math	1
MA 403	Introduction to Modern Algebra	3	MA 499	Independent Research in Mathematics	1-6
MA 405	Introduction to Linear Algebra	3	MEA 315	Mathematics Methods in Atmospheric Sciences	4
MA 407	Introduction to Modern Algebra for Mathematics Majors	3	MEA 320	Fundamentals of Air Pollution	3
MA 408	Foundations of Euclidean Geometry	3	PB 200	Plant Life	4
MA 410	Theory of Numbers	3	PB 205	Our Green World	3
MA 412	Long-Term Actuarial Models	3	PB 208	Agricultural Biotechnology: Issues and Implications	3
MA 413	Short-Term Actuarial Models	3	PB 213	Plants and Civilization	3
MA 416	Introduction to Combinatorics	3	PB 215	Medicinal Plants	3
MA 421	Introduction to Probability	3	PB 219	Plants in Folklore, Myth, and religion	3

PB 220	Local Flora	3	PP 241	The Worm's Tale: Parasites In Our Midst	3
PB 250	Plant Biology	4	PP 315	Principles of Plant Pathology	4
PB 277	Space Biology	3	PP 318	Forest Pathology	3
PB 295	Special Topics in Botany	1-4	PP 470	Advanced Turfgrass Pest Management	2
PB 321	Introduction to Whole Plant Physiology	3	PP 492	External Learning Experience	1-6
PB 325	Culinary Botany	3	PP 493	Special Problems in Plant Pathology	1-6
PB 345	Economic Botany	3	PP 495	Special Topics in Plant Pathology	1-3
PB 346	Economic Botany Lab	1	PSY 240	Introduction to Behavioral Research I	3
PB 360	Ecology	4	PSY 241	Introduction to Behavioral Research I Lab	1
PB 400	Plant Diversity and Evolution	4	PSY 242	Introduction to Behavioral Research II	3
PB 403	Systematic Botany	4	PSY 243	Introduction to Behavioral Research II Lab	2
PB 413	Plant Anatomy	2	SMT 200	Introduction to Sustainable Materials and Technology	3
PB 421	Plant Physiology	3	SMT 201	Sustainable Materials for Green Housing	2
PB 445	Paleobotany	4	SMT 202	Anatomy and Properties of Renewable Materials	3
PB 464	Rare Plants of North Carolina	3	SMT 203	Physical Properties of Sustainable Materials	4
PB 480	Introduction to Plant Biotechnology	3	SMT 206	Wood Manufacturing Site Visits	1
PB 481	Plant Tissue Culture and Transformation	2	SMT 210	Sustainable Materials Internship	1
PB 488	Systems Biology Modeling of Plant Regulation	3	SMT 232	Recycling to Create a Sustainable Environment	2
PB 492	External Learning Experience	1-6	SMT 240	Introduction to Wood Products Industries	2
PB 493	Plant Biology Supervised Undergraduate Research Experience	1-6			
PB 495	Special Topics in Plant Biology	1-6			
PB 503	Systematic Botany	4			
PB 513	Plant Anatomy	2			
PB 545	Paleobotany	4			
PB 564	Rare Plants of North Carolina	3			
PB 580	Introduction to Plant Biotechnology	3			
PB 588	Systems Biology Modeling of Plant Regulation	3			
PP 222	Kingdom of Fungi	3			
PP 232	Big Data in Your Pocket: Call it a Smartphone	3			

SMT 293	Independent Study in Sustainable Materials & Technology	1-6	SSC 201	Soil Science Laboratory	1
SMT 294	Independent Study in Sustainable Materials & Technology	1-6	SSC 332	Environmental Soil Microbiology	3
SMT 295	Special Topics in Sustainable Materials and Technology	1-3	SSC 341	Soil Fertility and Nutrient Management	3
SMT 301	Chemistry of Sustainable Materials	3	SSC 342	Soil and Plant Nutrient Analysis	1
SMT 302	Processing of Biomaterials	4	SSC 410	Soil Judging for Land Evaluation	1
SMT 308	Wood Processing	4	SSC 421	Role of Soils in Environmental Management	3
SMT 310	Introduction to Industrial Ecology	3	SSC 427	Biological Approaches to Sustainable Soil Systems	3
SMT 320	Industrial Chemical Pollutants	2	SSC 428	Service-Learning in Urban Agriculture Systems	1
SMT 330	Project Management for Sustainability	3	SSC 440	Geographic Information Systems (GIS) in Soil Science and Agriculture	3
SMT 346	Sustainable Materials Business Marketing	3	SSC 442	Soil and Environmental Biogeochemistry	3
SMT 441	Mechanical Properties of Sustainable Materials	4	SSC 452	Soil Classification	4
SMT 444	Sustainable Composites and Biopolymers	3	SSC 455	Soils, Environmental Quality and Global Challenges	3
SMT 450	Sustainable Business and Innovation	2	SSC 461	Soil Physical Properties and Plant Growth	3
SMT 483	Capstone in Sustainable Materials and Technology	3	SSC 462	Soil-Crop Management Systems	3
SMT 493	Independent Study in Sustainable Materials & Technology	1-6	SSC 470	Wetland Soils	3
SMT 494	Independent Study in Sustainable Materials & Technology	1-6	SSC 473	Introduction to Hydrologic and Water Quality Modeling	3
SSC 200	Soil Science	3	SSC 540	Geographic Information Systems (GIS) in Soil Science and Agriculture	3
			SSC 570	Wetland Soils	3
			SSC 573	Introduction to Hydrologic and Water Quality Modeling	3

ST 305	Statistical Methods	4	ST 433	Applied Spatial Statistics	3
ST 307	Introduction to Statistical Programming-SAS	1	ST 434	Applied Time Series	3
ST 308	Introduction to Statistical Programming - R	1	ST 435	Statistical Methods for Quality and Productivity Improvement	3
ST 311	Introduction to Statistics	3	ST 437	Applied Multivariate and Longitudinal Data Analysis	3
ST 312	Introduction to Statistics II	3	ST 440	Applied Bayesian Analysis	3
ST 350	Economics and Business Statistics	3	ST 442	Introduction to Data Science	3
ST 370	Probability and Statistics for Engineers	3	ST 445	Introduction to Statistical Computing and Data Management	3
ST 371	Introduction to Probability and Distribution Theory	3	ST 446	Intermediate SAS Programming with Applications	3
ST 372	Introduction to Statistical Inference and Regression	3	ST 491	Statistics in Practice	3
ST 380	Probability and Statistics for the Physical Sciences	3	ST 495	Special Topics in Statistics	1-6
ST 401	Experiences in Data Analysis	4	ST 497	Professional Experience in Statistics	1-3
ST 404	Epidemiology and Statistics in Global Public Health	3	ST 498	Independent Study In Statistics	1-6
ST 405	Applied Nonparametric Statistics	3	ST 499	Research Experience in Statistics	1-3
ST 412	Long-Term Actuarial Models	3	ST 505	Applied Nonparametric Statistics	3
ST 413	Short-Term Actuarial Models	3	ST 533	Applied Spatial Statistics	3
ST 421	Introduction to Mathematical Statistics I	3	ST 534	Applied Time Series	3
ST 422	Introduction to Mathematical Statistics II	3	ST 535	Statistical Methods for Quality and Productivity Improvement	3
ST 430	Introduction to Regression Analysis	3	ST 537	Applied Multivariate and Longitudinal Data Analysis	3
ST 431	Introduction to Experimental Design	3	ST 540	Applied Bayesian Analysis	3
ST 432	Introduction to Survey Sampling	3			

## Advanced Communication Electives

Code	Title	Hours	Counts towards
COM 289	Science Communication and Public Engagement	3	
ENG 331	Communication for Engineering and Technology	3	
ENG 332	Communication for Business and Management	3	
ENG 333	Communication for Science and Research	3	

## Spatial Technology Electives

Code	Title	Hours	Counts towards
FOR 353	GIS and Remote Sensing for Environmental Analysis and Assessment	3	
GIS 280	Introduction to GIS	3	
SSC 440	Geographic Information Systems (GIS) in Soil Science and Agriculture	3	
SSC 540	Geographic Information Systems (GIS) in Soil Science and Agriculture	3	

## Capstone Electives

Code	Title	Hours	Counts towards
ES 400	Analysis of Environmental Issues	3	
FOR 406	Forest Inventory, Analysis and Planning	4	
NR 400	Natural Resource Management	4	
NR 406	Conservation of Biological Diversity	3	
NR 500	Natural Resource Management	4	

## Semester Sequence

This is a sample.

### First Year

Fall Semester		Hours
ENV 101	Exploring the Environment	2
MA 114	Introduction to Finite Mathematics with Applications	3
ENV 100	Student Success in Environmental First Year	1
PB 200 or BIO 181	Plant Life or Introductory Biology: Ecology, Evolution, and Biodiversity	4
GEP Requirement ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/</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
<b>Hours</b>		<b>14</b>

### Spring Semester

CH 101 & CH 102	Chemistry - A Molecular Science and General Chemistry Laboratory	4
ENG 101	Academic Writing and Research <sup>1</sup>	4
FOR 150	Critical Thinking and Data Analysis <sup>1</sup>	2
ST 311	Introduction to Statistics	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
GEP Requirement ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/</a> )		2
<b>Hours</b>		<b>16</b>

### Second Year

Fall Semester		Hours
Chemistry or Physics Elective (p. 2)		4
FOR 172	Forest System Mapping and Mensuration I <sup>1</sup>	2
FOR 339	Dendrology <sup>1</sup>	4
Technical Elective (p. 2)		3
ST 312	Introduction to Statistics II	3
<b>Hours</b>		<b>16</b>

### Spring Semester

Economics Elective (p. 2)		3
FOR 250	Professional Development II: Communications in Natural Resources <sup>1</sup>	1
FOR 260	Forest Ecology <sup>1</sup>	4
SSC 200 & SSC 201	Soil Science and Soil Science Laboratory	4
MA 121 or MA 131	Elements of Calculus or Calculus for Life and Management Sciences A	3
<b>Hours</b>		<b>15</b>

### Summer

FOR 204	Silviculture <sup>1</sup>	2
FOR 261	Forest Communities <sup>1</sup>	2
FOR 264	Forest Wildlife <sup>1</sup>	1
FOR 265	Fire Management <sup>1</sup>	1

FOR 273	Forest System Mapping and Mensuration II <sup>1</sup>	3
<b>Hours</b>		<b>9</b>
<b>Third Year</b>		
<b>Fall Semester</b>		
FOR 303	Silvics and Forest Tree Physiology <sup>1</sup>	3
PB 220	Local Flora	3
Technical Elective (p. 2)		4
NR 301	Practicum for Professional Development I	1
FOR 374	Forest Measurement, Modeling, and Inventory <sup>1</sup>	3
<b>Hours</b>		<b>14</b>
<b>Spring Semester</b>		
Advanced Communication Elective (p. 14)		3
FOR 304	Theory of Silviculture <sup>1</sup>	4
FOR 350	Professional Development III: Ethical Dilemmas in Natural Resource Management <sup>1</sup>	1
Spatial Technology Elective (p. 14)		3
GEP Requirement ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/</a> )		3
<b>Hours</b>		<b>14</b>
<b>Fourth Year</b>		
<b>Fall Semester</b>		
FW 404	Wildlife Habitat Management	3
FOR 430	Forest Health and Protection <sup>1</sup>	3
NR 460	Renewable Natural Resource Management and Policy <sup>1</sup>	3
GEP Requirement ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/</a> )		3
Technical Elective (p. 2)		4
<b>Hours</b>		<b>16</b>
<b>Spring Semester</b>		
Capstone Elective (p. 14)		4
Technical Electives (p. 2)		7
GEP Requirement ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/</a> )		3
<b>Hours</b>		<b>14</b>
<b>Total Hours</b>		<b>128</b>

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

## Career Opportunities

Graduates in Forest Management are in high demand by state and federal land management agencies, forest products companies growing wood as a raw material, investment firms and insurance companies with land ownership portfolios, state forestry and agriculture extension services, the Peace Corps, environmental and wetland consulting firms, wood procurement companies, nursery and landscape management firms, and environmental organizations. After several years of experience, many graduates start their own businesses in forestry and land management consulting. Some graduates continue their education in graduate school to specialize in a wide variety of forestry and related programs.