

**Agriculture, Food & Natural Resources Career Cluster**  
**Forestry Science II**  
**Course Number: 03.45200**

**Course Description:**

This laboratory course provides students with entry-level skills for employment in the forest industry; including instruction in establishment of the forest by natural and artificial means, forest maintenance and surveillance, tree identification, protection, silviculture, tree and land measurement, mapping, preparation for timber sales and harvest, multiple use resource management, record keeping, and taxation.

**Course Standard 1**

**AFNR-FSII-1**

The following standard is included in all CTAE courses adopted for the Career Cluster/Pathways. Teachers should incorporate the elements of this standard into lesson plans during the course. The topics listed for each element of the standard may be addressed in differentiated instruction matching the content of each course. These elements may also be addressed with specific lessons from a variety of resources. This content is not to be treated as a unit or separate body of knowledge but rather integrated into class activities as applications of the concept.

**Standard: Demonstrate employability skills required by business and industry.**

The following elements should be integrated throughout the content of this course.

**1.1 Communicate effectively through writing, speaking, listening, reading, and interpersonal abilities.**

Person-to-Person Etiquette	Telephone and Email Etiquette	Cell Phone and Internet Etiquette	Communicating At Work	Listening
Interacting with Your Boss	Telephone Conversations	Using Blogs	Improving Communication Skills	Reasons, Benefits, and Barriers
Interacting with Subordinates	Barriers to Phone conversations	Using Social Media	Effective Oral Communication	Listening Strategies
Interacting with Co-workers	Making and Returning Calls		Effective Written Communication	Ways We Filter What We Hear
Interacting with Suppliers	Making Cold Calls		Effective Nonverbal Skills	Developing a Listening Attitude
	Handling Conference Calls		Effective Word Use	Show You Are Listening
	Handling Unsolicited Calls		Giving and Receiving Feedback	Asking Questions
				Obtaining Feedback
				Getting Others to Listen

Nonverbal Communication	Written Communication	Speaking	Applications and Effective Résumés
Communicating Nonverbally	Writing Documents	Using Language Carefully	Completing a Job Application
Reading Body Language and mixed Messages	Constructive Criticism in Writing	One-on-One Conversations	Writing a Cover Letter
Matching Verbal and Nonverbal communication		Small Group Communication	Things to Include in a Résumé
Improving Nonverbal Indicators		Large Group Communication	Selling Yourself in a Résumé
Nonverbal Feedback		Making Speeches	Terms to Use in a Résumé

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Showing Confidence Nonverbally		Involving the Audience	Describing Your Job Strengths
Showing Assertiveness		Answering Questions	Organizing Your Résumé
		Visual and Media Aids	Writing an Electronic Résumé
		Errors in Presentation	Dressing Up Your Résumé

### 1.2 Demonstrate creativity by asking challenging questions and applying innovative procedures and methods.

Teamwork and Problem Solving	Meeting Etiquette
Thinking Creatively	Preparation and Participation in Meetings
Taking Risks	Conducting Two-Person or Large Group Meetings
Building Team Communication	Inviting and Introducing Speakers
	Facilitating Discussions and Closing
	Preparing Visual Aids
	Virtual Meetings

### 1.3 Exhibit critical thinking and problem solving skills to locate, analyze and apply information in career planning and employment situations.

Problem Solving	Customer Service	The Application Process	Interviewing Skills	Finding the Right Job
Transferable Job Skills	Gaining Trust and Interacting with Customers	Providing Information, Accuracy and Double Checking	Preparing for an Interview	Locating Jobs and Networking
Becoming a Problem Solver	Learning and Giving Customers What They Want	Online Application Process	Questions to Ask in an Interview	Job Shopping Online
Identifying a Problem	Keeping Customers Coming Back	Following Up After Submitting an Application	Things to Include in a Career Portfolio	Job Search Websites
Becoming a Critical Thinker	Seeing the Customer's Point	Effective Résumés:	Traits Employers are Seeking	Participation in Job Fairs
Managing	Selling Yourself and the Company	Matching Your Talents to a Job	Considerations Before Taking a Job	Searching the Classified Ads
	Handling Customer Complaints	When a Résumé Should be Used		Using Employment Agencies
	Strategies for Customer Service			Landing an Internship
				Staying Motivated to Search

### 1.4 Model work readiness traits required for success in the workplace including integrity, honesty, accountability, punctuality, time management, and respect for diversity.

Workplace Ethics	Personal Characteristics	Employer Expectations	Business Etiquette	Communicating at Work
Demonstrating Good Work Ethic	Demonstrating a Good Attitude	Behaviors Employers Expect	Language and Behavior	Handling Anger
Behaving Appropriately	Gaining and Showing Respect	Objectionable Behaviors	Keeping Information Confidential	Dealing with Difficult Coworkers
Maintaining Honesty	Demonstrating Responsibility	Establishing Credibility	Avoiding Gossip	Dealing with a Difficult Boss
Playing Fair	Showing Dependability	Demonstrating Your Skills	Appropriate Work Email	Dealing with Difficult Customers
Using Ethical Language	Being Courteous	Building Work Relationships	Cell Phone Etiquette	Dealing with Conflict
Showing Responsibility	Gaining Coworkers' Trust		Appropriate Work Texting	

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Reducing Harassment	Persevering		Understanding Copyright	
Respecting Diversity	Handling Criticism		Social Networking	
Making Truthfulness a Habit	Showing Professionalism			
Leaving a Job Ethically				

### 1.5 Apply the appropriate skill sets to be productive in a changing, technological, diverse workplace to be able to work independently and apply team work skills.

Expected Work Traits	Teamwork	Time Management
Demonstrating Responsibility	Teamwork Skills	Managing Time
Dealing with Information Overload	Reasons Companies Use Teams	Putting First Things First
Transferable Job Skills	Decisions Teams Make	Juggling Many Priorities
Managing Change	Team Responsibilities	Overcoming Procrastination
Adopting a New Technology	Problems That Affect Teams	Organizing Workspace and Tasks
	Expressing Yourself on a Team	Staying Organized
	Giving and Receiving Constructive Criticism	Finding More Time
		Managing Projects
		Prioritizing Personal and Work Life

### 1.6 Present a professional image through appearance, behavior and language.

On-the-Job Etiquette	Person-to-Person Etiquette	Communication Etiquette	Presenting Yourself
Using Professional Manners	Meeting Business Acquaintances	Creating a Good Impression	Looking Professional
Introducing People	Meeting People for the First Time	Keeping Phone Calls Professional	Dressing for Success
Appropriate Dress	Showing Politeness	Proper Use of Work Email	Showing a Professional Attitude
Business Meal Functions		Proper Use of Cell Phone	Using Good Posture
Behavior at Work Parties		Proper Use in Texting	Presenting Yourself to Associates
Behavior at Conventions			Accepting Criticism
International Etiquette			Demonstrating Leadership
Cross-Cultural Etiquette			
Working in a Cubicle			

### Support of CTAE Foundation Course Standards and Georgia Standards of Excellence L9-10RST 1-10 and L9-10WHST 1-10:

Georgia Standards of Excellence ELA/Literacy standards have been written specifically for technical subjects and have been adopted as part of the official standards for all CTAE courses.

## Course Standard 2

### AFNR-FSII-2

**Explore, develop, and implement the comprehensive program of agricultural education, learn and demonstrate safe working habits in the agriculture lab and work sites, demonstrate selected competencies in leadership through the FFA and agricultural industry organizations, and develops plans for a Supervised Agricultural Experience Program (SAEP).**

- 2.1 Illustrate the relationship of the FFA within the Agricultural Education model and describe the role and function of the organizational structure from the chapter to national level.
- 2.2 Design, implement, and document SAE by recording steps, skills acquired, and financial information.
- 2.3 Demonstrate leadership and personal development skills through participation in the FFA.
- 2.4 Analyze skills, education requirements, income, and advantages and disadvantages of careers in natural resources management.
- 2.5 Explore the professional agricultural organizations associated with the course content.
- 2.6 Demonstrate safety practices when working in an outdoor environment.

## Course Standard 3

### AFNR-FSII-3

**Compare interrelationships in the forest environment between plants, soil, animals, water and man.**

- 3.1 Identify and describe characteristics of forest soils.
- 3.2 Describe and give examples of Best Management Practices (BMPs).
- 3.3 Explain the relationships between BMPs and the forest environment.
- 3.4 Discuss environmental concerns of forest production.
- 3.5 Analyze practices that benefit the environment.
- 3.6 Identify wetlands and explain the benefits of wetlands.
- 3.7 Explain policies concerning wetland use.
- 3.8 List and provide examples of endangered plant species of Georgia woodlands.
- 3.9 List and provide examples of endangered animal species of Georgia woodlands.
- 3.10 Explain policies concerning endangered species.

## Course Standard 4

### AFNR-FSII-4

**Describe the elements of managing an urban and community forest and identify the primary stakeholders important to the implementation of a successful urban and community forestry program.**

- 4.1 Explain the history or the urban and community forestry program in the U.S.
- 4.2 Identify and describe the geographic boundaries of the urban forest.
- 4.3 Describe the physical and biological elements of the urban forest.
- 4.4 Describe the urban forest ecosystem.
- 4.5 Explain how trees work to improve the environment.
- 4.6 Discuss the value of the urban forest to people.
- 4.7 Classify the basic principles of tree valuation.
- 4.8 Summarize activities associated with managing soil health in the urban forest.
- 4.9 Explain the importance and process of a tree inventory.
- 4.10 Describe the activities of establishing and maintaining the urban forest.
- 4.11 Explain the importance of a risk management program.
- 4.12 Analyze the basis for a street tree ordinance and major components.
- 4.13 Develop a maintenance plan.

- 4.14 Explain the role of volunteers in an urban forestry program.
- 4.15 Research employment opportunities in urban community forest.

## Course Standard 5

### AFNR-FSII-5

**Explain how many cultural practices have been practiced by the forest industry and adopted by private landowners in recent years to increase tree growth and reduce the time required to produce income from the forest.**

- 5.1 Explain the costs and benefits of genetically improved seedlings.
- 5.2 Describe how “morphologically improved” seedlings can produce more income.
- 5.3 Compare maximum volume production versus maximum return on investment.
- 5.4 Explain how chemical site preparation may be superior to mechanical on some sites.
- 5.5 Differentiate between the costs of chemical versus mechanical site preparation.
- 5.6 Explain how site preparation treatments will affect tree growth.
- 5.7 Explain how sub-soiling can benefit the growth of trees.
- 5.8 Describe the primary types of competition for pine stands in the south.
- 5.9 Explain how competition control affects pine tree growth.
- 5.10 Identify and provide examples of the different time periods for controlling competing vegetation.
- 5.11 Demonstrate the different methods of controlling competing vegetation.
- 5.12 Summarize the history of fertilization for forest stands in the south.
- 5.13 Describe the two primary site resources that affect forest productivity.
- 5.14 Determine when the greatest need for nutrients occurs.
- 5.15 Explain how intensive culture may increase the need for fertilization.
- 5.16 Analyze and compare the sources of nutrients used for forest fertilization.
- 5.17 Analyze the economic returns from forest fertilization.

## Course Standard 6

### AFNR-FSII-6

**Demonstrate management practices for wildlife and identify the common game species.**

- 6.1 Define terms used in wildlife management.
- 6.2 Describe the development of wildlife management in the United States.
- 6.3 Identify and categorize the major federal and state agencies directly involved with wildlife management.
- 6.4 Explain the roles of the agencies involved with wildlife management.
- 6.5 Describe the basic habitat requirements of a wildlife species.
- 6.6 Analyze and describe wildlife ecosystems.
- 6.7 Discuss each of the elements necessary for ideal wildlife habitat.
- 6.8 Explain the factors that affect wildlife populations.
- 6.9 Identify and classify the practices used in modern wildlife management.
- 6.10 Describe the factors that limit a wildlife population.
- 6.11 Develop a plan and plant a wildlife plot.
- 6.12 Identify and provide examples of the most common game species found in the southern part of the United States.
- 6.13 Describe the habitat, feeding habits, and life cycles of common game species found in the southern part of the United States.

## Course Standard 7

### AFNR-FSII-7

**Conduct a cruise of a tract of timber, conduct a survival check, conduct a herbicide assessment, and map a traverse using a hand-held data collection instrument.**

- 7.1 Determine the tract boundaries.
- 7.2 Compare and contrast a one-hundred percent cruise, fixed plot radius cruise, strip cruise and a variable plot radius/Prism cruise.
- 7.3 Determine the number of plots needed.
- 7.4 Conduct a cruise.
- 7.5 Calculate the probability that the cruise is accurate.
- 7.6 Determine the number of seedlings planted per acre.
- 7.7 Count the number of seedlings present in the spring and fall.
- 7.8 Determine the survival percentage.
- 7.9 Explain the purpose of conducting survival counts.
- 7.10 Determine the weed species on a tract.
- 7.11 Develop an herbicide treatment plan.
- 7.12 Assess the herbicide treatment.
- 7.13 Evaluate the effectiveness of the herbicide treatment.
- 7.14 Evaluate the pine stands for pine tip moth infestation.
- 7.15 Evaluate prescribed burn areas for bark beetle infestations.
- 7.16 Perform a general insect damage assessment.
- 7.17 Locate a sampling point and establish tract boundaries with a Global Positioning System (GPS) unit.
- 7.18 Locate forest roads and fire boundary lines with a GPS unit.
- 7.19 Delineate a timber sale area.

## Course Standard 8

### AFNR-FSII-8

**Outline major processes in the harvesting and manufacturing of forest products.**

- 8.1 Identify and describe the parts of the digestive system of fish.
- 8.2 Research the protein, energy, vitamin and mineral requirements for fish.
- 8.3 Draw conclusions on how anatomy and behavior affect feeding.
- 8.4 List and provide the ten essential amino acids.
- 8.5 Categorize essential fatty acids, fat-soluble and water soluble vitamins.
- 8.6 Research methods for preparing feed and feeding fish.
- 8.7 Evaluate ingredients in fish feed.
- 8.8 Assess the importance of winter feeding catfish.
- 8.9 Compare the different feeding practices of different species of fish.
- 8.10 Calculate the amount of feed needed.
- 8.11 Formulate a feed conversion ratio.
- 8.12 Formulate feed cost.

## Course Standard 9

### AFNR-FSII-9

**Describe alternative crops that can be produced in the forest.**

- 9.1 Identify and describe the factors affecting the production of pine straw.
- 9.2 Describe the procedure of harvesting of pine straw.
- 9.3 Evaluate marketing situations and techniques and how they affect soil fertilization.
- 9.4 Explain how removal of pine straw may require additional nutrients.
- 9.5 Identify species of trees grown in Georgia for Christmas trees.

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- 9.6 List and explain factors affecting production of Christmas trees.
- 9.7 Describe cultural practices used in the Christmas tree industry.
- 9.8 Develop a marketing plan for Christmas trees.
- 9.9 Discuss the history of the naval store industry in the South.
- 9.10 Describe the factors affecting collection of naval stores.
- 9.11 Demonstrate the skills necessary for collecting gum.
- 9.12 Analyze factors affecting marketing of naval stores.
- 9.13 Describe factors affecting economic return for wildlife enterprises.
- 9.14 Describe habitats suitable for wildlife enterprises.
- 9.15 Identify wildlife enterprises suitable for marketing.

### Course Standard 10

#### AFNR-FSII-10

#### **Demonstrate knowledge of the major factors affecting the economics of forest resources management.**

- 10.1 Identify and explain primary timber growing variables.
- 10.2 Determine timber growing costs with different variables.
- 10.3 Calculate the highest price that can be paid for bare land.
- 10.4 Explain the purpose of ad valorem taxes.
- 10.5 Describe three methods of determining bare land value.
- 10.6 Explain the differences between the preferential assessment program for forest properties and the conservation use valuation of forest properties.
- 10.7 Calculate timber harvest tax for a timber sale.
- 10.8 Explain allocation of capital costs to basis.
- 10.9 Explain the difference between land and timber accounts.
- 10.10 Explain expensing versus capitalization.
- 10.11 Explain how a timber sale can qualify for capital gains qualification.
- 10.12 Compare simple and compound interest.
- 10.13 Calculate the present and future value of a single sum.

### Course Standard 11

#### AFNR-FSII-11

#### **Identify and explain the major factors of managing and producing hardwoods.**

- 11.1 Identify and provide examples of the uses of hardwoods.
- 11.2 Identify and describe the types of southern hardwood forests.
- 11.3 Evaluate hardwood sites.
- 11.4 Determine site quality.
- 11.5 Determine site requirement characteristics.
- 11.6 Determine stocking guides.
- 11.7 Evaluate regeneration.
- 11.8 Conduct a timber stand improvement.
- 11.9 Demonstrate artificial regeneration techniques.

### Course Standard 12

#### AFNR-FSII-12

#### **Describe the latest trends in forestry primarily concerning national planning.**

- 12.1 Define the sustainable forestry initiative.
- 12.2 Explain why reforestation is most important.
- 12.3 Explain how water quality will be protected.
- 12.4 Explain how wildlife habitat will be enhanced.

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- 12.5 Describe how the visual impact of harvesting will be improved.
- 12.6 Explain why certain sites will be protected.
- 12.7 Describe how biodiversity conservation will be integrated.
- 12.8 Explain why wood utilization will be improved.
- 12.9 Describe the prudent use of forest chemicals to help ensure forest health.
- 12.10 Explain why sustainable forestry will be broadened to all forest lands.
- 12.11 Describe the benefits to companies for complying with sustainable forestry.
- 12.12 Explain why education is important for the sustainable forestry initiative.