



INSTRUCTIONAL PACKAGE

FOR 271

SILVICULTURE

Effective Term  
FALL 2018

# INSTRUCTIONAL PACKAGE

## DEPARTMENTAL MISSION STATEMENT:

### Forestry Management Technology Department & Program Mission Statement

The mission of the Department, the Programs and its faculty is to support the broader College's goals, but also provide a comprehensive silviculturally based environmental education that recognizes the broad multiple uses demanded from the forest environments of South Carolina, the Southeastern United States and the nation.

- We want our graduates to recognize how their daily decisions will have a lasting impact on the social, cultural, economic, and environment fabric of our state, region and country.
- Their natural resource decision making process must be based on the highest professional and ethical standards for the long term protection and promotion of a high demand resource.
- We strive to prepare well trained forest, wildlife and natural resource technicians for both public and private sector employers and promote career opportunities for our graduates.

## PART I: COURSE INFORMATION

Effective Term: 2018-10

COURSE PREFIX: FOR 271

CONTACT HOURS: 3 hours Lecture, 3 hours lab

COURSE TITLE: Silviculture

CREDIT HOURS: 4 credits

### RATIONALE FOR THE COURSE:

Forestry is a profession requiring the manipulation of environmental factors to achieve certain human goals (timber production, water quality improvement, wildlife habitat enhancement, etc.). The Silviculture course is an in-depth look into regeneration, intermediate treatments and harvesting operations performed on a forest property in order to achieve the goals of a landowner or society as a whole, given economic and ecological considerations.

### COURSE DESCRIPTION:

This course covers the treatment of forest stands to achieve prescribed objectives. Specific topics include intermediate forest management practices, the four basic harvest methods, and regeneration of trees.

### PREREQUISITES/CO-REQUISITES:

Credit level FOR 154 Minimum Grade D and Credit level FOR 156 Minimum Grade of C or Instructor Permission.

### REQUIRED MATERIALS:

Please visit the Bookstore online site for most current textbook information. Use the direct link below to find textbooks.

[BOOKSTORE.](#)

Enter the semester, course prefix, number and section when prompted and you will be linked to the correct textbook.

## **TECHNICAL REQUIREMENTS:**

Access to Desire2Learn (D2L), HGTC's student portal for course materials.  
WaveNet and D2L email access.

## **CLASSROOM ETIQUETTE:**

As a matter of courtesy to other students and your professor, please turn off cell phones and other communication/entertainment devices before class begins. If you are monitoring for an emergency, please notify your professor prior to class and switch cell phone ringers to vibrate.

**SAFETY:** Prior to going to the woods for a field lab, the instructor will hold a safety briefing identifying the boundaries of the study area, any known hazards and the proper use of Personal Protective Equipment assigned to that exercise.

**Lab Exercises:** This class has an outdoor lab associated with it. Please come appropriately dressed for lab with long pants and boots at a minimum.

## **Part II: Student Learning Outcomes**

### **COURSE OUTLINE:**

- |    |   |                |
|----|---|----------------|
| I. | INTRODUCTION (Chapter #1&2)                               | <u>Week #1</u> |
|    | A. Purpose of Silviculture                                |                |
|    | B. Basic Terminology                                      |                |
|    | C. Fields of Silviculture Practice                        |                |
|    | 1. Methods of Reproduction                                |                |
|    | 2. Intermediate Cuttings or Treatments                    |                |
|    | 3. Stand Protection                                       |                |
|    | D. Role of Cutting in Silviculture                        |                |
|    | 1. Stand Structure Modification                           |                |
|    | 2. Regulating of Growing Stock                            |                |
|    | E. Relationship of Silviculture to Management & Economics |                |
|    | F. Stand Dynamics   |                |
|    | 1. Stand disturbances                                     |                |
|    | 2. Age Classes  |                |
|    | 3. Stages of Stand Development                            |                |
|    | 4. Crown Classes  |                |
|    | 5. Choices of Developmental Patterns                      |                |

Outcomes:

Unit I: Student will become familiar with how silviculture relates to forest management and economics, tree classification, and the development of a silvicultural system.

1. Relate silviculture practices to forest management in broad terms.
2. Relate cutting practices to the manipulation of stand structure and growing stock.
3. List the purposes of silviculture.
4. Identify the various fields of silvicultural practice.

- |     |  |                |
|-----|--|----------------|
| II. | THINNING A STAND OF FOREST TREES (Chapter # 3&4) | <u>Week #2</u> |
|     | A. Fundamental Objectives of Thinning            |                |
|     | B. Tree Classification                           |                |

- C. Selection of Favored Trees
- D. Effects of Thinning
  - 1. Growth and Yield
  - 2. Economic Yield
  - 3. Tree Physical Development
- E. Three (3) Concerns of Thinning

Outcomes:

Unit II: Student will be able to explain the various impacts thinning has on an individual tree, the forest stand and associated plants.

- 1. Explain the effects of thinning on a stand of trees and on an individual tree.
- 2. Explain the three (3) main concerns of thinning.
- 3. Discuss first and subsequent thinning criteria.
- 4. Describe the practice of crop tree selection.
- 5. Explain the methods of tree classification.
- 6. Identify criteria on which "crop trees" are selected.

### III. METHODS AND APPLICATION OF COMMERCIAL THINNING (Chapter #5)

Weeks #3-4

- A. Advantages/Disadvantages Associated with Different Thinning Methods
  - 1. Low or German Method
  - 2. Crown or French Method
  - 3. Selection Method
  - 4. Mechanical Method
  - 5. Free Method
- B. Analysis of Stand for Thinning Method Selection
  - 1. Plantations
  - 2. Natural Seeded Stands
  - 3. Stand Age
  - 4. Landowner Objectives
  - 5. Understory Condition & Composition
  - 6. Tree Classification
  - 7. Stand Measurements
- C. Criteria for Thinning Applications
  - 1. Landowner Objectives
  - 2. Crown Class Distribution
  - 3. Timing of First Thinning
  - 4. Timing of Subsequent Thinnings
- D. Regulation of Stand Density
  - 1. Types of Approaches
  - 2. Parameters of Stand Density
- E. Effects of Thinning on Forest Protection Efforts
  - 1. Impacts on Future Stand Development
  - 2. Slash Disposal
  - 3. Fire Risk
  - 4. Watershed (+/-)
  - 5. Understory development

Outcomes:

Oct. 2017

Unit III: Student will become familiar with the various thinning approaches used in forest management, the stand conditions that identify a need for a thinning and how to match a thinning system to a forest stand's condition, composition and the landowner's objectives.

1. Identify various methods and modifications of thinning.
2. Identify stand conditions which create a need for thinning.
3. Identify other conditions which control the thinning method selected.
4. Describe the objectives, advantages and disadvantages of each thinning method.
5. Compare thinning methods and objectives desired.
6. Identify and describe stand conditions and composition, through measurements and observation.
7. Relate stand conditions and composition to correct thinning application.
8. Identify tree classification systems.
9. Relate application of thinning to landowner objectives.
10. Relate effect of thinning to intermediate and long term forest development.
11. Identify environmental impacts of thinning operations.

IV. RELEASE CUTTINGS & HERBICIDES (Chapter #6)

Week #5

A. Types of Cuttings to Release Stands

1. Release Cutting
2. Liberation Cutting
3. Weeding
4. Cleaning

B. Chemicals Used to Release Stands

1. Chemicals Used in Forestry Operations
2. Chemical Application Techniques
3. Chemical Action on Plants
4. Environmental Concerns

Outcomes:

Unit IV: Student should be able to identify the type of release cuttings to be used by stand conditions, the class of stems to be removed by cutting or chemical treatment and any potential environmental impacts.

1. Identify the types of release cuttings.
2. Describe the objectives of each type of release cutting and the class of stems to be removed.
3. Identify the ways and means of stem removal or chemical eradication.
4. Describe chemical activity on plants when used for stem removal.
5. Identify various means of chemical application.
6. Identify potential environmental impacts of chemicals used in release operations.

V. FINAL HARVEST, IMPROVEMENT AND SALVAGE CUTTINGS (Chapter #7)

Week #6

A. Types of Operations

1. Implement Cuttings
  - a) When to apply
  - b) Stems removed in operation
  - c) Objective of operation
  - d) Application in Even-aged stands
  - e) Application in Irregular stands
2. Salvage cuttings
  - a) Types of operations

- b) Objectives of operation
    - c) Application
  - 3. Sanitation cuttings
    - a) Objectives
    - b) Application
  - 4. Final Harvest Determinations
    - a) Determining rotation length based on Silvicultural, Economic or Biological goals
- B. Control of Cutting
  - 1. Means of Control
  - 2. Control of Waste and Value Loss
  - 3. Damage to Stand and Soil by Cutting

Outcomes:

Unit V: Student should be able to identify the goals of improvement cutting and given particular stand conditions, which trees are identified for removal. Student should also be able to identify the differences between salvage and sanitation cutting and potential damage that can happen to a site during forestry operations.

1. Identify types of improvement cuttings.
2. Describe objectives of each type of improvement cutting.
3. Identify classes of stems to be removed.
4. Compare improvement operations in Even-aged versus Uneven-aged stands and when to use each type of operation.
5. Identify the properties of salvage and sanitation cutting.
6. Identify means of cutting control.
7. Identify means of waste and destruction in harvesting operations.
8. Describe damage to stand and site by operations.

#### UNIT VI. REGENERATION (Chapter 7-10)

Weeks #7-10

- A. Artificial Methods of Regeneration
  1. Planting Seedlings
    - a) Reproduction of regeneration type
    - b) Seed collection, storage & treatment
    - c) Planting methods
    - d) Site Factors to be considered
  2. Direct Seeding
    - a) Seed source
    - b) Seeding practices
    - c) Site improvement
- B. Natural Regeneration
  1. Seed Tree Criteria
  2. Climatic Factors
  3. Silvicultural systems
- C. Preparation & Treatment of Site by Mechanical, Chemical and/or Burning
  1. Competition Control
  2. Slash Disposal
  3. Improvements to Site
- D. Seed Orchard Operations
  1. Wild vs. Genetically Improved Seed

- 2. Collection & Processing
- E. Nursery Operations
  - 1. Sowing & Development
  - 2. Grading, Storage & Transportation
  - 3. Care During Planting
- D. Genetic Improvement
  - 1. Species Selection
  - 2. Provenances

Outcomes:

**Unit VI: Student will identify the methods of site preparation and regeneration available, their advantages and disadvantages, their costs (monetarily and time), and site improvements that are available (Program Learning Outcome (PLO)). A landowner letter will be written for a stand outlining appropriate methods and procedures of establishment (PLO – artifact).**

- 1. Identify alternatives available for regeneration.
- 2. Describe tree improvement work in the South.
- 3. Describe steps used in obtaining seed for regeneration.
- 4. Identify methods of planting seedlings.
- 5. Describe southern nursery operations.
- 6. Identify factors to be considered for usage of natural seed source.
- 7. Identify seedbed preparation methods.
- 8. Identify advantages and disadvantages of planting and natural seeding.
- 9. Describe factors to consider while planning regeneration of a site.
- 10. Describe seed orchard operations.
- 11. Identify site preparation methods and treatments.
- 12. Compare stands using various means of regeneration.
- 13. Compare sites using various measures of site preparation.
- 14. Identify the merits of forest fertilization.

UNIT VII. SILVICULTURAL SYSTEMS(Chapter 11-17)

Weeks #11-14

- A. Development of Silvicultural Systems (Chapter 11)
  - 1. Classification of Reproduction Method
    - a) High Forest or Seed Origin
    - b) Coppice or Vegetative Forest
  - 2. Distinction between methods
- B. Formulating Silvicultural Systems
  - 1. Objectives, Goals & Ownership Characteristics
  - 2. Provision for Reproduction
  - 3. Use of Growing Space and Site
  - 4. Control of Damaging Agents
  - 5. Provision for Sustained Yield
  - 6. Use of Forest Capital
- C. Clearcutting Methods (Chapter 12)
  - 1. Type of Forest Produced
  - 2. Artificial Reproduction
  - 3. Natural Regeneration
  - 4. Conditions Essential for Success
  - 5. Arrangement of Areas

6. Modification of Methods
7. Advantages and Disadvantages
8. Application of Method
- D. Seed Tree and Shelterwood Methods (Chapter 14)
  1. Seed Tree Method
    - a) Seed Tree Characteristics
    - b) Number and Distribution of Trees
    - c) Modification of Method
    - d) Advantages and Disadvantages
  2. Shelterwood Method
    - a) Characteristics and Steps to Method
    - b) Number and Interval of Cuts
    - c) Modification of Method
    - d) Advantages and Disadvantages
- E. Selection Method & Uneven-Aged Management (Chapter 15)
  1. Balanced Uneven-aged stands
  2. Irregular Uneven-aged stands
  3. Modifications
  4. Advantages and Disadvantages
  5. Choice of Tree to be Harvested
  6. Application of Method
- F. Coppice Method or Vegetative Reproduction (Chapter 13)
  1. Forest Produced over Time
  2. Types of Vegetative Reproduction
    1. Coppice (Stump & Root)
    2. Layering
    3. Coppice with Standards Method
  3. Advantages & Disadvantages
  4. Uses in North America
- G. Regulation of Cutting (CH 17)
  1. Area method
  2. Volume method

Outcomes:

Unit VII: Student will be able to describe the various silvicultural systems that are used in the Southeast, how they are implemented and their advantages and disadvantages in terms of the environment and use of forest capital.

1. Define silvicultural systems.
2. Compare high and low forest reproduction methods.
3. Identify the objectives of a silvicultural system.
4. Discuss control of damaging agents.
5. Discuss the use of forest capital.
6. Define sustained yield.
7. Discuss the need for planned reproduction.
8. Define clearcutting.
9. Identify the modifications of clearcutting.
10. Discuss the application of clearcutting and its advantages and disadvantages.
11. Define the seedtree system, the characteristics of a good seedtree, and their number and



distribution.

12. Identify the modifications of the seedtree system.
13. Discuss the application of the seedtree system and its advantages & disadvantages.
14. Define the shelterwood system and its application.
15. Define the selection system and its application.
16. Discuss the modifications of the shelterwood and selection systems.
17. Discuss these systems as they are applied to southern forestry.
18. Compare site protection, wildlife management, and watershed management between various silvicultural systems.
19. Discuss coppice or vegetative system applications.
20. Discuss the regulation of cutting and give examples of each method.

***\*Students – please refer to the Instructor’s Course Information sheet for specific information on assessments and due dates.***

### **Part III: Grading and Assessment**

#### **EVALUATION OF REQUIRED COURSE MEASURES/ARTIFACTS\***

Students’ performance will be assessed and the weight associated with the various measures/artifacts are listed below.

#### **EVALUATION\***

The course grade will be assigned as follows:

1) Unit Tests	50%
2) Written Field Lab Reports	30%
3) Quizzes	10%
4) Final Exam	<u>10%</u>
	100%

***\*Students, for the specific number and type of evaluations, please refer to the Instructor’s Course Information Sheet.***

#### **GRADING SYSTEM:**

State the College’s or departmental grading system as delineated in the Catalog. Please note the College adheres to a 10 point grading scale A = 100 – 90, B = 89- 80, C = 79 – 70, D = 69 – 60, F = 59 and below. You must have your Dean’s approval if changes in the scale are made.

Grades earned in courses impact academic progression and financial aid status. Before withdrawing from a course, be sure to talk with your instructor and financial aid counselor about the implications of that course of action. Ds, Fs, Ws, WFs and Is also negatively impact academic progression and financial aid status.

The Add/Drop Period is the first 5 days of the semester for **full term** classes. Add/Drop periods are shorter for accelerated format courses. Please refer to the academic calendar for deadlines for add/drop ([ACADEMIC CALENDAR](#)). You must attend at least one meeting of all of your classes during that period. If you do not, you will be dropped from the course(s) and your Financial Aid will be reduced accordingly.

## Part IV: Attendance

Horry-Georgetown Technical College maintains a general attendance policy requiring students to be present for a minimum of eighty percent (80%) of his or her classes in order to be eligible to receive credit for any course. However, due to the varied nature of courses taught at the College, a more rigid attendance policy may be required by individual instructors. At a minimum, a student may be withdrawn from a course(s) after he or she has been absent in excess of ten percent (10%) of the total contact hours for a course. **Instructors define absentee limits for their class at the beginning of each term; please refer to the Instructor Course Information Sheet.**

**For online and hybrid courses**, check your Instructor's Course Information Sheet for any required on-site meeting times. Please note, instructors may require tests to be taken at approved testing sites, if you use a testing center other than those provided by HGTC, the center may charge a fee for its services.

## Part V: Student Resources



### The Student Success and Tutoring Center (SSTC)

The SSTC offers to all students the following **free** resources:

1. **Academic coaches** for most subject areas, **Writing Center Support**, and **college success skills**.
2. **On-line student success and academic support resources**.

Visit the SSTC website: [Student Success & Tutoring Center](#) and visit the student services tab in your WaveNet account to schedule appointments using TutorTrac. For more information, call: SSTC Conway, 349-7872; SSTC Grand Strand, 477-2113; and SSTC Georgetown, 520-1455. Room locations and Live Chat is available on the SSTC website.



### Student Information Center: WaveNet Central (WNC)

WNC offers to all students the following **free** resources:

1. **Getting around HGTC**: General information and guidance for enrollment!
2. Use the **Online Resource Center (ORC)** for COMPASS support, technology education, and online tools.
3. **Drop-in technology support or scheduled training** in the Center or in class.
4. **In-person workshops, online tutorials and more services** are available.

Visit the WNC website: [Wavenet Central](#). Live Chat and Center locations are posted on the website. Or please call one of the following locations: WNC Conway, 349-5182; WNC Grand Strand, 477-2076; and WNC Georgetown, 520-1473.

## Disability Services

HGTC is committed to providing an accessible environment for students with disabilities. Inquiries may be directed to Jocelyn Williams, Director of Student Development on the Conway Campus Jaime Davis, Counselor/Advisor on the Georgetown Campus or Kristin Griffin, Counselor on the Grand Strand Campus. These individuals will review documentation of the student's disability and, in a confidential setting with the student, develop an educational accommodation plan.

Note: It is the student's responsibility to self-identify as needing accommodations and to provide acceptable documentation. After a student has self-identified and submitted documentation of a disability, accommodations may be determined, accepted, and provided.

## Statement of Equal Opportunity/Non-Discrimination Statement

Horry Georgetown Technical College prohibits discrimination and harassment, including sexual harassment and abuse, on the basis of race, color, gender, national or ethnic origin, age, religion, disability, marital status, veteran status, sexual orientation, gender identity, or pregnancy in educational programs and/or activities.

### ***Title IX Requirements***

Horry Georgetown Technical College prohibits the offenses of domestic violence, dating violence, sexual assault, and stalking. Any student who believe he or she has experienced or witnessed discrimination including sexual harassment, domestic violence, dating violence, sexual assault or stalking is encouraged to report such incidents to one of the College's Title IX Coordinators.

\*Faculty and Staff are required to report incidents to the Title IX Coordinators when involving students. The only HGTC employees exempt from mandatory reporting are licensed mental health professionals (only as part of their job description such as counseling services).

<b>Inquiries regarding the non-discrimination policies:</b>	
Student and prospective student inquiries concerning Section 504, Title II, and Title IX and their application to the College or any student decision may be directed to the Associate Vice President for Student Affairs.	Employee and applicant inquiries concerning Section 504, Title II, and Title IX and their application to the College may be directed to the Associate Vice President for Human Resources.
<b>Dr. Melissa Batten, AVP Student Affairs</b> <i>Title IX Coordinator</i> Building 1100, Room 107A, Conway Campus PO Box 261966, Conway, SC 29528-6066 843-349-5228 <a href="mailto:Melissa.Batten@hgtc.edu">Melissa.Batten@hgtc.edu</a>	<b>Jacquelyne Snyder, AVP Human Resources</b> <i>Section 504, Title II, and Title IX Coordinator</i> Building 200, Room 212A, Conway Campus PO Box 261966, Conway, SC 29528-6066 843-349-5212 <a href="mailto:Jacquelyne.Snyder@hgtc.edu">Jacquelyne.Snyder@hgtc.edu</a>