# Scope & Sequence

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| Course Name: Forestry and Woodland Ecosystems **TSDS PEIMS Code:** 13001700 | | | **Course Credit:** 1.0  **Course Requirements:** grades 10-12.  **Prerequisites:** None. |
| **Course Description:** Forestry and Woodland Ecosystems examines current management practices for forestry and woodlands. Special emphasis is given to management as it relates to ecological requirements and how these practices impact the environment. | | | |
| **NOTE:** This is a suggested scope and sequence for the course content. This content will work with any textbook or instructional materials. If locally adapted, make sure all TEKS are covered. | | | |
| **Total Number of Periods**  **Total Number of Minutes**  **Total Number of Hours** | 175 periods  7,875 minutes  131.25 hours\* | \*Schedule calculations based on 175/180 calendar days. Scope and sequence allows additional time for guest speakers, student presentations, field trips, remediation, extended learning activities, etc. | |
| **Unit Number, Title, and Brief Description** | **# of Class Periods\***  (assumes 45-minute periods)  Total minutes per unite | **TEKS Covered**  **130.23 Knowledge and skills** | |
| **Unit 1: Career Exploration in the Agricultural/Forestry Industry**  Students will learn about careers in various areas in the forestry industry, the personal skills needed to obtain one of these jobs and how skills needed for success have changed over time. Students will understand the importance of time management, the importance of effective communication and appropriate interaction in the workplace as well as understand the importance of a first impression. This unit will culminate in an experiential activity designed to allow the students to create a resume and cover letter  with a job description and to participate in a mock job interview with a panel of possible employees. | 5 periods  225 minutes | (1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:  (A) identify career development, education, and entrepreneurship opportunities in the field of forestry and woodland ecosystems;  (B) apply competencies related to resources, information, interpersonal skills, and systems of operation in forestry and woodland ecosystems;  (C) demonstrate knowledge of personal and occupational safety, health, environmental regulations, and first-aid policy in the workplace; and  (D) analyze employers' expectations, including appropriate work habits, ethical conduct, legal responsibilities, and good citizenship skills. | |
| **Unit 2: Supervised Agricultural Experience (SAE)**    This unit, students will be able to define and describe Supervised Agricultural Experience (SAE) programs. Students will be able to explain how SAE’s are a vital part of the Agriculture Education Program by participating in local CTSO activities such as FFA as well as engage in a required SAE project. Students will be able to identify key partners in developing a successful SAE. Through involvement in an SAE, students will learn expected workplace behavior, develop specific skills within the industry, and will be given the opportunity to apply academic and occupational skills in the workplace. | 10 periods  450 minutes | (2) The student develops a supervised agriculture experience program. The student is expected to:  (A) plan, propose, conduct, document, and evaluate a supervised agriculture experience program as an experiential learning activity;  (B) apply proper record-keeping skills as they relate to the supervised agriculture experience;  (C) participate in youth leadership opportunities to create a well-rounded experience program; and  (D) produce and participate in a local program of activities using a strategic planning process. | |
| **Unit 3: Dendrology**    This unit exposes the students to the importance of understanding the value of identification of trees and horticultural properties as it relates to the forestry industry. Students will use a dichotomous key to identify various Texas trees. Additionally, the students will learn about the form and function of a trees anatomy (leaves, trunk, branches and roots). Students will investigate the various soil types found in forested and woodland areas. As a culminating activity for this unit, students will collect leaves outside of class and use the internet/dichotomous key to identify the tree belonging to each leaf. Students will report their findings to the class. | 20 periods  900 minutes | (3) The student describes the principles of forestry and woodland ecosystems. The student is expected to:  (A) describe the historical and economic significance of forestry;  (B) illustrate tree anatomy and morphology;  (C) differentiate between species of trees;  (D) classify forest and woodland soils; | |
| **Unit 4: Forest Ecosystems and Ecological Principles**  This unit provides an introduction to forest ecosystems and defines ecology, ecosystems, vertical stratification, types of ecosystems, the energy flow within an ecological system and food webs. Ecological succession and the various ways in which monitoring and sustaining ecosystems is also covered. As a culminating activity, divide the class into groups of three or four. Using available resources, groups should research and define succession and create a diagram to represent the gradual changes in plants and vegetation over time. Students will present their findings to the class. | 30 periods  1,350 minutes | (3) The student describes the principles of forestry and woodland ecosystems. The student is expected to:  (E) describe silviculture;  (F) compare and contrast forest and woodland ecosystems;  (G) describe photosynthesis and respiration as they relate to forest and woodland species;  (H) describe watershed management as it relates to forest and woodland ecosystems;  (I) describe sexual and asexual reproduction in forest and woodland species;  (J) define succession; and  (K) compare natural and managed forests and woodlands. | |
| **Unit 5: Forestry Biometric Skills**  This unit students will learn that before timber is manufactured, potential harvests must be evaluated through a process called “cruising timber”. Students will learn the procedures for measuring timber (i.e., standing tree and log volume). Students will learn how to use measuring devices and tools, such as a diameter tape and a Biltmore stick. They will also go over formulas for calculating saw timber volume and pulpwood calculations. Students will cruise timber using the trees located on the school property or at a nearby forest area. Students will measure the diameter of the tree, height and stand volume. They will record their measurements. | 30 periods  1,350 minutes | (4) The student demonstrates forestry biometrics skills. The student is expected to:  (A) calculate tree volume;  (B) estimate timber growth and yield;  (C) evaluate forest and woodland quality by cruising timber stands; and  (D) scale logs to calculate their quality and volume. | |
| **Unit 6: Forestry Management**  This unit discusses the importance of having a good forestry management system in place as the forestry market relies solely on the ability of producers to generate high volumes of usable timber. Students will learn about Best Management Practices (BMP’s), forest crops, stands and maintaining wildlife habitats. Additionally, students will learn how to develop a control plan for destructive agents as well as discuss mixed use possibilities for forested and woodland areas. At the end of the unit, students will be given different forested land scenarios for a plot of land and determine which management techniques would be best to use on that plot. Students will share their ideas and results with the class. | 25 periods  1,125 minutes | (5) The student demonstrates knowledge of forestry management skills. The student is expected to:  (A) identify forestry management techniques;  (B) discuss multiple-use possibilities for forest and woodlands areas; and  (C) develop a control plan for destructive agents such as fire, insects, and disease. | |
| **Unit 7: Harvesting Timber**  This unit, students will explore the methods in which timber is harvested, identify harvesting products and determine the equipment used in the harvesting of timber. Additionally, students will gain knowledge of the lumber industry from the cutting of trees through processing and then production of the final product. This unit culminates in an activity designed to allow students to demonstrate all they have learned about timber harvesting and manufacturing processes. | 35 periods  1,575 minutes | 6) The student identifies softwood and hardwood forest management and use practices. The student is expected to:  (A) identify principles of forestry economics;  (B) research sources of forestry management assistance;  (C) identify harvesting practices and equipment;  (D) describe merchandising practices; and  (E) evaluate research in forestry and wood technology.  (7) The student describes the role of wood technology in forest product development. The student is expected to:  (A) compare timber manufacturing processes and products; and  (B) discuss research and development issues in forestry and wood technology. | |
| **Unit 8: Maps and Surveys**  This unit, the students will explore the different types of maps and surveys available in the forestry industry as well as how to interpret their meaning. Students will evaluate elevations and terrain features from topographic maps and locate and interpret images on a map from using mapping technologies such as Geographic Information Systems (GIS) and Global Positioning Systems (GPS). At the end of this unit, students will research career opportunities in the mapping (GIS) industry. The students will share their findings with the class. | 20 periods  900 minutes | (8) The student applies cartographic skills to natural resource activities. The student is expected to:  (A) compare and contrast types of maps;  (B) interpret map features and legends;  (C) compare map scale to actual distance;  (D) evaluate elevation and terrain features from topographic maps;  (E) use land survey and coordinate systems; and  (F) locate position and interpret images using a geospatial interface. | |