INSTRUCTOR: Dr. Thomas Kuzmic

OFFICE & CONTACT INFO: Office: 015 Agricultural Hall
Office Hours: Appointments have priority; walk-ins welcome as available.
- Monday: 11:30am-noon; 1:00-4:30pm
- Tuesday: 1:00-4:30pm
- Wednesday: none
- Thursday: 1:00-4:30pm
- Friday: 11:30am-noon
Phone: 405-744-5463
E-mail: thomas.kuzmic@okstate.edu

TIME & PLACE: Monday, Wednesday & Friday, 10:30 - 11:20am, 201 Ag Hall

COURSE DESCRIPTION: A survey of forestry as an art, science and profession, covering topics in the human uses and values associated with forests and related natural resources; ecosystem services provided by forests; global forest biomes; forest distribution; tree biology and growth; forest ecosystem process and management; forest health and restoration; history of forestry in the USA; forest ethics; and career opportunities.

COURSE OBJECTIVES: By the completion of this course, you should be able to demonstrate your knowledge and skills in the following:

♦ Understand and appreciate the extent and importance of forest resources, how humans use and manage them, and environmental considerations and implications associated with forest use and management.

♦ Understand and appreciate the relationship between natural ecosystem process and well-conceived scientific management of forests by professional foresters as a continuing, sustainable, renewable resource that provides a broad diversity of amenities, goods and ecosystem services.

♦ Formulate a basic vocabulary of terminology related to trees, forests, forest ecosystems, and forest resource management.

♦ Understand the historical relationship between people and forests in the USA and how forestry, forest policy, and forest ownership developed through time.

♦ Appreciate the role that the Society of American Foresters and its code of ethics plays in the forestry profession.

♦ Develop an awareness of career opportunities in forestry.
Lectures and class activities complemented by PowerPoint presentations, and independent homework assignments will comprise the course. All PowerPoints and course materials will be posted on CANVAS, the OSU on-line learning site. Students are expected to download materials from CANVAS, attend class regularly, ask questions, engage in our dialogue, and to take good notes for the optimal learning experience.

An outline of course topics is attached. It is recommended that you refer to it on a regular basis to keep track of class progress.

No textbook is required. Some reading materials may be assigned from time to time. Specifically, students will be assigned to read one chapter from a book selected by the instructor that presents an informative and interesting story of how trees and forests played an important role in the early history of the United States. A written assignment will accompany this reading (see "Evaluation & Grading" on the next page).

Your performance in the course will be evaluated on the following basis:

Exams (4@100 points each) 400 points
Homework assignments (5@20 pts) 100 points
Book chapter reading assignment 50 points
TOTAL POINTS POSSIBLE 550 points

A = 495 - 550 points 90-100%
B = 440 - 494 points 80-89%
C = 385 - 439 points 70-79%
D = 330 - 384 points 60-69%
F = below 330 points 0-59%

EXAMS: Scheduled for the following dates:
- **Friday, September 13** (Week #4 at regular class time)
- **Wednesday, October 7** (Week #7 at regular class time)
- **Wednesday, October 30** (Week #11 at regular class time)
- **Monday, December 9** (Final Exam Week at 10:00-11:50am)

The exams will not be comprehensive. Each will only include the material covered during the class sessions since the previous exam.

**HOMEWORK & ASSIGNMENT TIMELINE:**

- **HW-1:** Forest Uses & Values Survey
  Assigned: Aug. 23
  Due: Aug. 30
  Points: 20

- **HW-2:** The Trees of Our Lives
  Assigned: Aug. 30
  Due: Sept. 6
  Points: 20

- **HW-3:** Dendrochronology
  Assigned: Sept. 6
  Due: Sept. 16
  Points: 20
• HW-4: Wood & Paper Home Audit  
  Assigned: Sept. 16  
  Due: Sept. 23  
  Points: 20

• BOOK READING ASSIGNMENT:  
  Assigned: Sept. 25  
  Due: Oct. 18  
  Points: 50

• HW-5: Forest Health: Insect & Disease Threats  
  Assigned: Nov. 13  
  Due: Nov. 20  
  Points: 20

COURSE FAILURE TO TAKE AN EXAM AND/OR SUBMIT A HOMEWORK ASSIGNMENT ON SCHEDULED DATES WILL RESULT IN A "ZERO" GRADE. Students who anticipate or experience a credible difficulty with meeting a deadline should discuss their situation with the instructor during office hours beforehand unless circumstances prohibit prudent notification---in which case, send an e-mail or make a phone call if you are not able to attend class on the day an exam is given or an assignment is due, and then present your circumstances to the instructor within two days afterwards.

CLASS REGULAR CLASS ATTENDANCE AND ACTIVE PARTICIPATION IS HIGHLY ENCOURAGED IN ORDER TO GAIN THE MOST FROM THIS ACADEMIC EXPERIENCE AND TO CHART A TRAJECTORY TOWARD SUCCESS ON EXAMS AND ASSIGNMENTS. THE DECISION TO ATTEND CLASS (OR NOT) LIES WITH EACH STUDENT. WHETHER PRESENT OR NOT, STUDENTS ARE HELD LIABLE AND RESPONSIBLE TO KNOW AND LEARN ALL CLASS MATERIAL. ATTENDANCE AND MEANINGFUL PARTICIPATION WILL BE MONITORED AND ACKNOWLEDGED IN CONSIDERATION OF BORDERLINE FINAL GRADE DETERMINATIONS. THERE WILL BE NO MAKE-UP CLASSES, NO REVIEW SESSIONS, AND NO MAKE-UP EXAMS GIVEN. OF COURSE, YOU MAY COME BY TO ASK QUESTIONS ABOUT MISSED MATERIAL AFTER FIRST REVIEWING OUR PROGRESS ON THE CURRENT POWERPOINT.

OSU POLICY: We will adhere to the standard University policy and schedule for DROPPING OR WITHDRAWING FROM CLASS as delineated in the official OSU Syllabus Attachment and posted on the OSU website.

ACADEMIC INTEGRITY: Students are expected to align with the standards of academic integrity and ethical conduct as delineated in University Academic Regulation 6.12 in the OSU catalog and as presented on the OSU website at www.academicintegrity.okstate.edu. Behavior that violates this policy will not be tolerated and will be subject to disciplinary action.

PEP TALK: My paramount goal is to incite awareness, understanding, appreciation and enthusiasm for trees, forests, and forestry. We all have a stake in our forests and how they are used and managed by and for people, to serve many uses, values, goods and services. Some of you have chosen this field as your major and career ambition, and others are in the class to fulfill a requirement in another major or as an elective. Regardless, my assumption is that you all are interested in forestry and desire to learn more about it. We need to recognize and understand that we all depend on trees and forests every day of our lives and that they certainly are a key element of our "quality of life"!
I will do my best to provide you with an exciting and challenging academic experience. However, I want you to know and accept that it’s a two-way responsibility. I can only do so much. I expect each student to accept responsibility for their success in the course. I expect each of you to attend class regularly, to keep up with assignments and turn them in on time, to participate in class discussions, to ask questions, and to be motivated to learn and explore new ideas!
I. SETTING A FORESTRY FOUNDATION
   A. What is forestry?
      1. Profession
      2. Science & art
      3. Conservation & sustainability
      4. Human benefit
   B. Key foundation concepts
      1. Trees and forests are renewable resources
      2. Forest ecosystem services
         a. Provisioning services
         b. Supporting services
         c. Regulating services
         d. Cultural services
      3. All organisms are consumers
      4. Change
      5. Conundrum of human and natural time scales
      6. Natural resource ideology
         a. Utilitarian
         b. Commodity v. noncommodity
         c. Anthropocentric v. biocentric
      7. Forest owners
      8. Linkage of science, social, political and economic elements
      9. Different perspectives
      10. Balancing act of natural resource stewardship
      11. Serving the "Greatest Good"

II. UNDERSTANDING TREES & WOOD
   A. Trees are numerous and diverse
   B. Tree classification
      1. Gymnosperms
      2. Angiosperms
      3. Dendrology
   C. What is a tree?
   D. Structural and functional parts of a tree
      1. Crown
      2. Stem (trunk)
      3. Roots
      4. Leaves
      5. Vascular cells (xylem and phloem)
   E. Tree physiological processes
      1. Photosynthesis
      2. Respiration
      3. Translocation
      4. Water transport and role
      5. Transpiration
      6. Reproduction
         a. Sexual reproduction
         b. Asexual reproduction
      7. Floral, fruit and seed strategies
   F. Tree growth processes
      1. Primary growth
      2. Secondary growth
G. Woody stem anatomy
H. Annual growth rings
I. Dendrochronology
J. Wood
   1. Chemical and fiber structure
   2. Wood properties
   3. Wood and paper products

III. FOREST BIOMES OF THE WORLD
   A. Our world still is quite green
   B. What is a forest?
      1. Open-canopy forests
      2. Closed-canopy forests
      3. Riparian forests
   C. Status and extent of the global forest
      1. Distribution across the continents
      2. Distribution by biome
      3. Growth, loss, and human use
      4. Global forest realities in the Third-World
   D. Factors affecting global forest distribution
      1. Climate
      2. Geography
      3. Geologic process
      4. Natural disturbance regimes
   E. The Boreal Forest
      1. Geographic extent
      2. Climate, landscape, soils and ecosystem components
      3. Diversity (plant and animal)
      4. Human use and management potential
   F. The Temperate Forest
      1. Geographic extent
      2. Climate, landscape, soils and diversity
      3. Four temperate forest types
         a. broad-leaved deciduous
         b. needle-leaved evergreen
         c. mixed
         d. broad-leaved evergreen
      4. Diversity (plant and animal)
      5. Human use and management potential
   G. The Tropical Forest
      1. Geographic extent
      2. Climate, landscape, soils and ecosystem components
      3. Five tropical forest types
         a. rainforest
         b. drought-deciduous forest
         c. subtropical forest
         d. cloud forest
         c. mangrove forest
      4. Diversity (plant and animal)
      5. Human use and management potential
         a. tropical forestry
         b. deforestation issues
         c. slash and burn farming
         d. sustainable techniques and programs
   H. Forests of Oklahoma
      1. Five forest types
         a. pine-oak
b. oak-hickory
c. Crosstimbers
d. Rocky Mountain
e. riparian

IV. ECOLOGY OF FOREST ECOSYSTEMS
   A. Ecological linkage between forests and people
   B. Ecology defined
   C. Environment
      1. Climatic components
      2. Edaphic components
      3. Topographic components
      4. Water availability
      5. Scale: micro v. macro
   D. Ecosystems
      1. Function and process
      2. Complexity
      3. Structural diversity
      4. Biotic diversity (biodiversity)
      5. Dynamic (change)
   E. Factors influencing tree species distribution
      1. Tolerance
      2. Shade tolerance
      3. Photosynthetic productivity
      4. Light compensation point
      5. Light saturation point
   F. Silvics
   G. Ecological niche
   H. Life history patterns
      1. Ruderal plants
      2. Competitor plants
      3. Stress tolerant plants
   I. Nutrients and nutrient cycles
      1. Essential nutrients
      2. Nutrient inputs, outputs, availability and pools
      3. Nutrient cycling and transfer
      4. Symbiosis
      5. Carbon cycle
   J. Forest succession
      1. Seral stages (pioneer, climax, subclimax)
      2. Sources of change
      3. Speed and process
      4. Habitat succession
   K. Landscape ecology
      1. Elevational influence
      2. Latitudinal influence
      3. Geology and geomorphological influence
      4. Influence of animals, insects and disease
      5. Human influence
   L. Ecological role of fire in forest ecosystems
      1. Natural fire regimes and fire-dependent ecosystems
      2. Serotiny
      3. Forest structure and habitat interspersion
      4. Mineral seedbed
      5. Natural fuel load
      6. Disease control
      7. Nutrient flush
8. Negative effects of fire on ecosystems

M. Tree and forest growth
   1. Sigmoid growth
   2. Stages of tree development and growth
   3. Growth productivity over time
   4. When to harvest...or not

N. Old-growth forests
   1. Characteristics of old-growth forests
   2. Values and issues associated with old-growth

O. Ecosystem restoration
   1. Present-day objectives and initiatives
   2. Case-study: Shortleaf pine-big bluestem ecosystem of the Ouachita highlands and the red-cockaded woodpecker

V. SILVICULTURE & FOREST ECOSYSTEM MANAGEMENT
   A. Definition, objectives and basic concept
   B. Understanding and mimicking natural disturbance patterns
   C. Growth and development of forest stands
      1. Managed succession
      2. Even-aged v. uneven-aged stands
      3. Pure v. mixed stands
      4. Stages of tree development
      5. Crown classes of trees
   D. Silvicultural systems: a cycle of renewability
      1. Even-aged systems
         a. clearcutting system
         b. seed-tree system
         c. shelterwood system
      2. Uneven-aged system: selection system
      3. Silvical factors involved in the selection of a silvicultural system for forest stand management
   E. Site preparation for a renewed forest
      1. Objectives and challenges
      2. Techniques
         a. reduction of logging slash
         b. control of competing plants
         c. seedbed manipulation
   F. Regeneration of forest stands
      1. Natural regeneration
      2. Artificial regeneration
   G. Stand tending and protection
      1. Site productivity
      2. Treatments to manage and improve developing stands
         a. thinning
         b. fertilizer application
         c. pruning
         d. control of competing vegetation
         e. timber stand improvement (TSI)
         f. prescribed burning
      3. Protection form wildfire, insects, and disease
   H. Timber harvest systems
      1. Planning elements
      2. Process, techniques and equipment
         a. felling
         b. transport from stump to landing
         c. processing at the landing
         d. loading
VI. FOREST HEALTH & PROTECTION
   A. What is a forest health?
   B. What is a healthy forest?
   C. What is "forest protection"?
   D. Forest enemies and destructive agents
   E. Insect and disease interactions in the forest
   F. Diagnosis dilemma: sign v symptom
   G. Modes of insect attack
      1. Defoliators
      2. Bark beetles
      3. Tip moths
      4. Wood borers
   H. Disease agents and mode of attack
      1. Fungi
      2. Nematodes
      3. Parasitic flowering plants
   I. Negative effects of insects and disease
   J. Beneficial attributes of insects and microorganisms
   K. Forest pest management strategy
   L. Wildfire in the forest
      1. Causes of wildfire
      2. Wildfire policy development in the USA
      3. Wildfire at the Wildland:Urban Interface (WUI)
      4. Factors affecting wildfire behavior
      5. National Fire Danger rating System
      6. Fire prerequisites: the Fire Triangle
      7. Fire suppression techniques (fire-fighting)
      8. The Smokey Bear story
   M. Forests: A natural cycle of renewability

VII. HISTORY & DEVELOPMENT OF FORESTRY IN THE USA
   A. Early natural resource perspectives, leaders and policy development
      1. Myth of Superabundance
      2. The Public Domain
      3. Early thinkers and difference-makers
         a. Henry David Thoreau
         b. George Perkins Marsh
         c. Franklin Hough
         d. John Muir
      4. Forest Reserve Act & Organic Administration Act
      5. Emergence of the Conservation Movement & Professional Forestry
         a. Gifford Pinchot
         b. Theodore Roosevelt
         c. Carl Schenck
         d. Biltmore Forest School
      6. Creation of the US Forest Service
   B. Forest policy and advancement in the 20th Century
      1. Weeks Act & Clarke-McNary Act
      2. Multiple Use - Sustained Yield Act
      3. National Environmental Policy Act
      4. Forest & Rangeland Renewable Resources Planning Act
      5. National Forest Management Act
      6. Forest Stewardship Act
      7. Resilient Federal Forests Act
C. Forest ownership and stewardship
   1. Why consider and worry about who owns the forest?
   2. Forest land distribution and productivity in the USA
   3. Public forests
      a. US Forest Service & the National Forest System
      b. Other federal agencies
      c. State agencies and forests
   4. Private forests
      a. forest industry
      b. non-industrial forests
   5. Forest growth and removal
D. Professional development and ethics in forestry
   1. Society of American Foresters (SAF)
   2. SAF Code of Ethics