NRES 405/605
SILVICULTURE AND REGIONAL SILVICULTURE

Course Syllabus

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Office Hours: Tuesday and Thursday 9-10 am or by appointment.

Course Description: Theory and methods of controlling establishment, composition, growth, and quality of forest stands. Application of silvicultural practices to important species and forest types of the U.S. Lecture + Lab, 4+3; Credits, 5.

Course Prerequisites: NRES 100; NRES 345; junior or senior standing and completion of courses satisfying UNR Silver Core Objectives 1-8.


Course Objectives:
1. To become familiar with the qualitative and quantitative interpretive criteria used to describe and classify forest stands and sites, including those relating to species composition, age structure, density, productivity, and damaging agents.
2. To become familiar with the methods used to establish forest stands following their disruption or loss due to natural or anthropogenic disturbances.
3. To become familiar with the methods used to prepare forest sites for the establishment of tree stands and to maintain site conditions that enhance stand health and vigor.
4. To become familiar with the methods used to tend established forest stands such that their health and vigor are maintained over extended time periods.
5. To become proficient at incorporating forest stand establishment and management methods into comprehensive silvicultural prescriptions for stands representative of western U.S. forest cover types.

Student Learning Outcomes—Upon successful completion of NRES 405, students will be able to:
1. Classify forest stands and diagnose their health and vigor based upon their species composition, age structure, density, productivity, and extant damaging agents.
2. Identify, refine, and schedule appropriate reproduction methods used to establish forest stands following disruption or loss of prior vegetation communities on western U.S. forest sites.
3. Identify, refine, and schedule appropriate site preparation methods used to facilitate forest stand establishment and to maintain stand health and vigor in western U.S. forest cover types.

4. Identify, refine, and schedule appropriate intermediate treatments used to maintain or enhance stand health and vigor in western U.S. forest cover types.

5. Apply the knowledge identified above by incorporating it into comprehensive silvicultural prescriptions that integrate the interpretation and diagnosis of extant western U.S. forest stand productivity and condition and the obtainment of the desired future condition of the stand and site through selection and scheduling of the reproduction, site preparation, and intermediate treatment methods that will best achieve the defined multiple-use and ecosystem management objectives.

Note: The Student Learning Outcomes identified above are designed to satisfy the UNR Silver Core Objective 14 entitled Application, specifically expressed as “Students will be able to demonstrate knowledge and skills developed in previous Core and major classes by completing a project or structured experience of practical significance.” Specifically, laboratory assignments 5-9 and the final examination will entail preparation of silvicultural prescriptions that require professional writing, data analysis and interpretation, and the synthesis of scientific and land management principles.

Field Trips:
There will be two full-day field trips designed to familiarize students with the procedures used to describe, establish, and maintain forest stands. Attendance at these field trips is mandatory.

Examinations:
There will be two mid term exams and one final exam, with the latter a comprehensive examination of the material covered by the course in its entirety in the form of the preparation of a silvicultural prescription unaided by use of the textbook or class notes. For undergraduates, each of the three exams will account for 20% of their final grade. For graduate students, each exam will account for 10% of their final grade. The timing of each of the exams is identified in the Topics Outline below.

Laboratory Assignments:
There will be nine laboratory assignments to be completed by undergraduates and graduate students alike, with five of them dedicated to the formulation and writing of silvicultural prescriptions. Collectively, the nine assignments will account for 40% of the final grade for undergraduate and graduate students. The timing of each of these assignments is identified in the Topics Outline below.

Term Projects:
Graduate students will be responsible for a term project that demonstrates an advanced understanding of class material on a topic mutually agreed upon by the course instructor and the student. The term project will account for 30% of the final grade for graduate students.
Grading Scale:

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<th>Grade</th>
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<tr>
<td>A</td>
<td>90-100%</td>
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<td>B</td>
<td>80-89%</td>
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<td>C</td>
<td>70-79%</td>
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<td>D</td>
<td>60-69%</td>
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<td>F</td>
<td>&lt;60%</td>
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Statement on Late Assignments:
It is expected that every effort will be made to submit assignments when due whether they are examinations, laboratory exercises, or term projects. In the event that an assignment must be submitted late, 10 points will be deducted for each day, or any part thereof, the assignment is past due.

Topic Outline:

I. Introduction (Week 1)
   A. Silviculture
   B. Regional Silviculture

II. Forest classification and distribution (Week 1)
   A. Global
   B. Western United States
   C. Eastern United States

III. Forest soils and site productivity (Week 2)
   A. Morphology and classification
   B. Soil water
   C. Fertility and fertilization
   D. Soil surveys
   E. Site index
   Laboratory Assignment #1-Site Quality Assessment

IV. Forest stands (Week 2, 3, and 4)
   A. Composition
   B. Structure
   C. Tree classification
   D. Stand dynamics
   E. Growth and yield
   Laboratory Assignment #2-Growth and Yield Projection
   F. Rotations
   Laboratory Assignment #3-Rotation Determination
   G. Density and stocking
   Laboratory Assignment #4-Stand Density Quantification

V. Reproduction methods
Examination #1
A. Artificial methods (Week 4 and 5)
   1. Seed collection and treatment
   2. Seedling production
   3. Planting
   4. Direct seeding
B. Natural methods (Week 6 and 7)
   1. Clearcut
   2. Seed-tree
   3. Shelterwood
   4. Selection
   5. Coppice

VI. Site preparation (Week 8)
A. Mechanical methods
B. Chemical methods
C. Prescribed fire
D. Manual methods

VII. Intermediate treatments (Week 9 and 10)
A. Cleaning, weeding, and liberation cuttings
B. Improvement cuttings
C. Thinning
D. Sanitation and salvage cuttings
E. Pruning

VIII. Biotic damaging agents (Week 10)
A. Insects
B. Parasitic plants
C. Pathogenic fungi

Examination #2

IX. Silvicultural prescription elements (Week 11)
A. Land classification
B. Management activity schedule
C. Quantitative growth and yield projection

X. Regional silvicultural prescription development
A. Pacific Southwest region (Week 11 and 12)
   Laboratory Assignment #5-Even Aged Jeffrey Pine Prescription
   Laboratory Assignment #6-Mixed Sierra Nevada Conifer Prescription
B. Intermountain region (Week 13)
   Laboratory Assignment #7-Even Aged Ponderosa Pine Prescription
C. Pacific Northwest region (Week 14)
   Laboratory Assignment #8-Uneven Aged Douglas-Fir Prescription
D. Rock Mountain region (Week 15)
   Laboratory Assignment #9-Engelmann Spruce and Subalpine Fir Prescription
E. Final Examination (Week 16)-Final Prescription
Statement on Academic Dishonesty:
Cheating, plagiarism, or otherwise obtaining grades under false pretenses constitute academic dishonesty according to the code of this university. Academic dishonesty will not be tolerated and penalties can include canceling a student's enrollment without a grade and giving an F for the course or for the assignment. For more details, see the UNR General Catalog.

Statement on Disability Services:
Any student with a disability needing academic adjustments or accommodations is requested to speak with the Disability Resource Center (Thompson Building, Suite 101) as soon as possible to arrange for appropriate accommodations.

Statement for Academic Success Services:
Your student fees cover usage of the Math Center (784-4433 or www.unr.edu/mathcenter/), Tutoring Center (784-6801 or www.unr.edu/tutoring-center), and University Writing Center (784-6030 or http://www.unr.edu/writing-center). These centers support your classroom learning; it is your responsibility to take advantage of their services. Keep in mind that seeking help outside of class is the sign of a responsible and successful student.

Statement on Audio and Video Recording:
Surreptitious or covert video-taping of class or unauthorized audio recording of class is prohibited by law and by Board of Regents policy. This class may be videotaped or audio recorded only with the written permission of the instructor. In order to accommodate students with disabilities, some students may have been given permission to record class lectures and discussions. Therefore, students should understand that their comments during class may be recorded.