Mount Baker High School
Instructor: Todd Rightmire todd@mtbaker.wednet.edu
Class Title: Advanced Natural Resources –Fall 2007
Pre-Requisite: Environmental Biology
Grade Level: 10-12
Semester: 3 hour course (.5 science credit/.5 occupational ed credit)
Texts and resources used:
Trees of Washington. EB0440. WSU Cooperative Extension
Measuring Trees. PNW 31. Pacific Northwest Extension Publication
Hanley, Donald P., Baumgartner, David M. Forest Ecology in Washington. EB1943.
Various Internet Sources can be found at:
http://www.mtbaker.wednet.edu/ffa/Links.htm#Forestry

All students may earn college credit through the College Tech Prep application process. The Competency Profile for each college course is attached to this syllabus. Students must complete all of the competencies listed (B or better) for each course. During the semester most of the competencies will be covered in class...some may require additional independent work by the student. My advice is to start this process early so there is no delay in your enrollment or direct-credit process.

I. Tree and Tool Identification
   a. Identify native plants and trees to Washington State.
   b. Identify different forestry tools and demonstrate their proper and safe use.
   c. Collect trees and shrubs and display them on a board
   d. Understand scientific nomenclature, how to properly write and identify scientific names
   e. Identify the scientific names of Douglas Fir, Red Alder, Western Red Cedar, and Western Hemlock
   f. Identify the different ecosystems and processes that determine species range in Washington State.

II. Timber Cruising
   a. Define dbh, merchantable height, basal area
   b. Using a clinometer, diameter tape, wedge prism and charts determine the board feet of a particular stand of timber ranging from 1/10 of an acre to 80 acres.
   c. Make volume estimates for Mt. Baker School District property using variable plot sampling, tariff tables, form classes, and fixed plot sampling
   d. Calculate the current annual increment, average radial growth, mean annual increment, beginning basal area/acre, current basal area/acre, growth projection factor, future volume projections for school district properties.
   e. Utilize timber management software to record data and make projections for the calculations above. Display graphs to show data.
   f. Demonstrate accurate methods for slope correction factor and determining diameter of trees,

III. Timber Stand Management

a. Understand the processes and diagram photosynthesis, respiration, translocation, and transpiration.
b. Identify the structures involved in the processes of photosynthesis, respiration, translocation, and transpiration.
c. Identify methods of thinning and how it relates to tree growth and improvement.
d. Identify different harvesting methods and their applications.
e. Tour different harvest sites and identify what management decisions were involved in the decision making process.
f. Understand regeneration methods and their purposes.
g. Justify forest management decisions based on practicality, regulations, potential, economics, and environmental quality.

IV. Soils
a. Define terms related to soil and forest management
b. Describe the 3 textures of soil and identify soil types based on feel, density, and soil surveys.
c. Use a soil survey to assess, compare, contrast, and interpret our forest lands and the capabilities of those lands.
d. Collect data and interpret results of forest plots for pH, Fe, Ca, N, P, K.
e. Demonstrate nutrient testing and its effect on timber production.
f. Diagram and interpret the nitrogen cycle and carbon cycle.
g. Describe the role of organic matter and decomposition in forest ecology.
h. Identify unique forest soil and organism characteristics
i. Understand the impact of erosion on the ecosystem
j. Utilize GIS maps to interpret soil information
k. Determine slope using a clinometer.
l. Identify and describe the soil profiles and develop your own soil monolith.

V. Diseases/Pests/Fire
a. Identify common tree diseases and pests, their impact, and control.
b. Understand the factors involved in disease outbreaks and their control.
c. Describe the factors involved in forest fires and their management
d. Understand the role fire plays in the natural environment

VI. Land Measurement and Maps
a. Utilize a topographical map to determine altitude and slope
b. Use township, range, section, and quarter sections to determine locations.
c. Use a compass to find a location on a map
d. Use a GPS to mark and find waypoints.
e. Use GPS software to mark a location

VII. Rules and Regulations
a. Understand the sections of the Forest Practices Act, National Environmental Policy Act, and the US Forest Plan
b. Identify the different natural resource agencies and their responsibilities.
c. Use stream classifications to set potential harvest boundaries
d. Understand the impacts of forest management on watershed health.
e. Demonstrate knowledge of the Forests and Fish Law

f. Identify the various state and federal agencies responsible for forests and their management objectives.

VIII. Tree Reproduction and Genetics
   a. Diagram and explain the tree improvement process.
   b. Explain the reproductive cycle of trees
   c. Understand the roll genetics play in tree improvement and selection
   d. Demonstrate an understanding of the Hardy-Weinberg Equilibrium, Bell shaped curve, genetic equilibrium, crossbreeding, inbreeding, and somatic embryogenesis.
   e. Compare and contrast different methods of tree breeding and cloning.
   f. Conduct biotechnology experiments to determine heredity, relationships, and genetic diversity.

IX. Issues Research
   a. Identify major issues regarding forestry and natural resource management.
   b. Collect information and develop a presentation for your issue.
   c. Evaluate different media, articles, and publications and identify bias.
   d. Criticize and critique other issues and opposing viewpoints.
   e. Defend a position on an issue.

Grading Scale:
92-100 = A
90-91.9 = A-
88-89.9 = B+
82-87.9 = B
80-81.9 = B-
78-79.9 = C+
72-77.9 = C
70-71.9 = C-
68-69.9 = D+
60-67.9 = D
59.9 - = F

Estimated percentages and points
62.5% Class Assignments, tests, quizzes (625 points)
22.5% Participation (5 points per day – 225 points)
- 0 points for being absent (excused or unexcused, only exception is for school activity)
- -2 points for being tardy
- -2-5 points for being off task
- -2 points for not having calculator, paper, notebook, etc

15% SAE Record Book and Report (150 points)

Absences: Unexcused absences cannot be made up upon returning to school.

Late work: Accepted up to one week past the due date at 75% maximum credit allowed.

Since this is an Agriculture class, an SAE project is required. This includes the class assignments of issues research. It must be done outside of the normal school day. This can also include the following: Feeding fish at the hatchery, animal projects, research projects on the school forest lands, etc. A record system will be discussed in class and details of what is expected and how to properly complete forms.

Final Exam will be worth approximately 150 points

Students must keep electronic copies of all computer based assignments in their own individual folder.

Required materials and supplies:

- Calculator (scientific – cos, sin, tan, square root)
- Rain gear
- boots and outdoor clothes
- Warm clothes for wet and cold days

Web-based assignments will be available at www.mtbaker.wednet.edu/ffa

Portfolio Items, can include any 2 of the following items:
Final Exam
Landscape Management System Silver Lake or Sumas Mt.
Forestry Issues Research