

## AG 516 BOTANY\FORESTRY SCIENCE

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**COURSE DESCRIPTION:** A course designed to introduce students to the biological, environmental and ecological concepts encountered in a temporal forest environment.

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<b>TOTAL MINUTES</b>	<b>4,230</b>

### **A. Life and Structure of Woody Plants**

1. Identify reproduction methods of woody plants
2. Describe sexual reproduction methods and structures of woody plants
3. Describe asexual reproduction methods and structures of woody plants
4. Explain how woody plants grow
5. Identify the parts of a tree and their functions
6. Identify different tree forms

**B. Naming and Classifying Woody Plants**

1. Match terms and definitions associated with plant classification
2. Describe different classification systems of living things
3. Identify levels of botanical classification system
4. Demonstrate the ability to use the taxonomic key to identify common forest plants

**C. Forest Zones of the United States**

1. Identify six major forest vegetation zones of the U.S.
2. Describe climatic and vegetation characteristics of the major U.S. forest zones

**D. Dendrology of Idaho Tree Species**

1. Match the scientific name to the common names of Idaho trees
2. Identify Idaho tree species based on tree characteristics
3. Match the tree species to the elevations and areas that they are found in Idaho
4. Describe special adaptations of each tree species to environmental hazards such as drought, fire, disease, and insects

**E. Forest Tree Variability and Diversity**

1. Describe the evolutionary sequence of forest trees
2. Identify the components of phenotypic variation
3. Identify sources of variation
4. Explain patterns of gynecological differentiation
5. List examples of gynecological differentiation

**F. Solar Radiation**

1. Match terms associated with solar radiation with their definition
2. Explain how sunlight is important to development of trees
3. Discuss how trees react to various levels of sunlight
4. Identify different types of light and their importance to tree and forest plant growth

## **G. Temperature**

1. List the effects of latitude, altitude and topographic position on forest temperature
2. Describe temperature differences at the soil surface and within the forest
3. Explain temperature effects on plant growth
4. Describe cold injury to plants

## **H. Atmospheric Moisture and Other Factors**

1. Match terms associated with moisture with their definition
2. Explain how water vapor is exchanged between the plant and the atmosphere
3. Describe the effects of different forms of moisture on the forest
4. Identify geological variation in precipitation
5. Describe the importance of carbon dioxide to trees
6. Explain the effects of wind and pollutants on the forest
7. Describe what causes lightning and its effects on the forest

## **I. Climate**

1. Match the climate classification systems to their names
2. Describe how climate influences forests and how forests influence climate
3. Explain how human activities modify the climate

## **J. Soil**

1. Identify forest soils by their parent material
2. Match forest soil classifications to their descriptions
3. Describe methods by which forest soils are transported
4. Identify physical properties of forest soils
5. Explain the different forest soil profile developments
6. Describe the effect of topographic position on soils

## **K. Nutrient Cycle**

1. Diagram nutrient cycles of the forest
2. Explain nutrient uptake in trees
3. Describe effects of nutrients on tree growth
4. Describe how nutrients are lost to or locked up in the forest system

**L. Soil-Plant-Water Cycle**

1. Identify the importance of forests as a source of water
2. Diagram the Soil-Plant-Water cycle
3. Explain how trees control transpiration
4. Describe how water deficits affect tree growth
5. Describe the relationship between precipitation and distribution of forests
6. Explain how human activities in the forest affect water yield

**M. Fire Effects**

1. Match the types of fires with their descriptions
2. Identify the ways that fire can damage trees and forests
3. Identify the causes of fires
4. Explain how tree species have adapted to fire

**N. Forest Animals**

1. Identify the kinds and abundance of forest animal species
2. Explain the interrelationships between animals and the forest
3. Identify plant defense adaptations against animals
4. Explain how different animals cause tree damage
5. Describe the impact of large animals on the forest site

**O. Forest Succession**

1. Identify the stages of forest succession
2. Define forest succession
3. Describe primary succession
4. Explain the concept of climax
5. Describe why a forest is always changing

**P. Disturbance Factors (Forest Protection)**

1. Identify the common methods of forest destruction
2. Explain the role of catastrophic devastation in the forest ecosystem
3. Describe how destruction changes the composition of the forest

**Q. Spatial Variation in the Forest**

1. Explain the concept of a forest community

2. Describe spatial continuity of the forest community
3. Define discrete and merging forest communities

**R. The American Forest Since 1600**

1. Identify the characteristics of the presettlement forest
2. List contemporary observers of American forests
3. Describe how human activity has changed the forests
4. Compare the American forests to European forests