



Tree and Stand Dynamics

Course Outline

Module 1.1: Identify plants and describe their physiology, growth, morphology, and syncology

Standard 1 - Tree and Stand Dynamics

Demonstrable Competency: 1) Identify plants and describe their physiology, growth, morphology, and syncology

Note: This Module partially addresses Standard 1, Demonstrable Competency 1. In order to fully demonstrate the components of the competency listed above, participants must (a) successfully complete the related field training course (Module 1.4) or (b) arrange in advance with the provincial regulator an alternate “hands on” evaluation method in the field

Course Description

Overall objectives of Module 1.1 are to increase student’s knowledge and comprehension of biophysical elements of forest and urban forest ecosystems, with particular attention to plant and tree physiology, tree species life history characteristics, and tree species-species and species-environment interactions. Specific objectives are to prepare participants to be able to: Identify plants in a regional context; Describe the anatomy morphology, and physiology of plants; Explain the interaction between plants and environment; Describe plant communities; and Explain the relationships between and within plant communities. Participants are strongly encouraged to undertake related field training (Module 1.4).

Course Schedule

This course involves a combination of recorded lectures, readings, assignments and participation in semi-synchronous online discussion forums and synchronous tutorials with instructors and other participants over an **8-week period**:

- **Week 1**
 - **Introductory lectures**
 - “Introduction to Standard 1”

- **Core lecture**
 - “Tree functional biology - Trees and light - basic biophysics of light and photosynthesis, gap dynamics, early vs. late successional trees [seed types, tree architecture], shade tolerance classes, tree size and successional status relationships”
- **Core readings**
 - Chapter 1 - What is a tree and how does it grow? Wilson, B.F. 1984. The Growing Tree. University of Massachusetts Press, Amherst, MA. 152 p.
- **Week 2**
 - **Core lectures**
 - “Tree functional biology - Water and other abiotic factors - conifer vs. hardwood water transport, flood tolerance, wind, temperature, shade, drought tolerance, and other factors that influence the form and functional biology of trees, stands, and forests.”
 - “Basics of wood anatomy - earlywood vs. latewood, vessel elements, resin canals, diffuse porous & ring porous hardwoods, ray cells”
 - **Core readings**
 - Chapter 2 - Tree design: problems and solutions; and Chapter 3 - Additive and multiplicative growth. Wilson, B.F. 1984. The Growing Tree. University of Massachusetts Press, Amherst, MA. 152 p.
 - **Online discussion forum**
- **Week 3**
 - **Online tutorial with instructor**
 - Discuss content to-date and assignment 1
 - **Introduction to assignment #1**
 - Discuss additive and multiplicative growth and the role of meristems in elongation and thickening of tree shoot and root axes.
- **Week 4**
 - **Online discussion Forum**
 - **Continue to work on Assignment #1**
- **Week 5**
 - **Assignment #1 due (submit online)**
 - **Online tutorial with instructor**
 - Discuss content to date and assignment #2
 - **Introduction to assignment #2**
 - Compare and contrast the ground cover you would expect to encounter in lowland black spruce forest types of the Boreal forest region with that commonly associated with tolerant hardwood forest types of the Great-Lakes St. Lawrence forest region. Provide ground cover descriptions, and the explain relationship between vegetation types that make up the ground cover and tree cover in both forest types. If there was a large

canopy opening in a mature stand in each forest type, how do you think the ground cover, shrubs, and saplings would differ from that under more continuous forest cover?

- **Week 6**
 - **Submit proposal for final paper**
- **Week 7-8**
 - **Continue to work on Assignment #2**
 - **Assignment #2 due end of week 8 (submit online)**

Grading

- Discussion forum posts: 20%
- Participation in tutorials: 10%
- Assignment 1 - short essay: 20%
- Final paper proposal: 5%
- Assignment 2 - final paper: 45%



Bridge Training Program for Foresters

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