Course Outline

Module 2.1: Describe the components, characteristics, and processes of forest ecosystems and how they interact

Standard 2 - Forest To Landscape: Structure, Function and Dynamics Demonstrable Competency: 1) Describe the components, characteristics, and processes of forest ecosystems and how they interact

Course Description

Overall objectives of Module 2.1 are to enhance students' knowledge and comprehension of forest ecosystems at multiple spatial scales, and to establish an understanding of the relationships that exist between stand-level, forest-level, and landscape-level structure and function with an emphasis on the interaction of biophysical elements such as tree composition, size, and age distributions and the ecosystem services that they provide. Participants are encouraged to undertake complimentary field training (Module 2.5)

Specific objectives are to enable students to: Describe living and non-living components; Identify and describe major ecosystem conditions, cycles, and processes within forests and landscapes; Explain how ecosystem conditions can be characterized across a variety of scales; Discuss ecosystem dynamics and ecological sustainability; and Explain forest productivity and how it is determined.

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 2"
  - **Core Lectures**
    - "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 at multiple spatial scales"
        - "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."
    - **Core readings**
        - Chapter 16 - Description, Classification, and Mapping of Forest Ecosystems. Kimmins, J.P. 1997. Forest Ecology: A foundation for sustainable management. 2nd ed. Prentice Hall, Upper Saddle River, N.J. 596 p.

- **Week 2**
    - **Core lectures**
        - "Hierarchical Organization: Biology vs. Forestry Biology – stands as operational units, Normal forest concept, Silvicultural intensity continuum: technological forestry vs. ecological forestry; domesticated vs. regulated vs. exploited forest"
    - **Core readings**
        - Forward (by E.O. Wilson) and Preface and Text Part 1. Foreman, R.T. 1997. Land Mosaics: The Ecology of Landscapes and Regions. Cambridge University Press, Cambridge, UK. 656 p.
    - **Online discussion forum**

- **Week 3**
    - **Online tutorial with instructor**
        - Discuss content to-date and assignment 1
    - **Introduction to assignment #1**
        - List and describe common forest ecosystem characteristics at the scale of forested landscapes, forests, and forest stands (respectively). Include in your descriptions a discussion of ecosystem interactions that span one or more of these three spatial scales.

- **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**
        - Discuss ecosystem dynamics and ecological sustainability of one of Ontario's three forest regions: Carolinian, Great-Lakes St.-Lawrence or Boreal. Include in your discussion concerns surrounding the impacts of

forest harvesting, and harvesting impact mitigation strategies that are integral to sustainable forest management in the Region of your choice.

- **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: 20%
- Final paper proposal: 5%
- Assignment 2 - final paper: 45%

Bridge Training Program for Foresters

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