

ERS 234: FOREST ECOSYSTEMS AND MANAGEMENT

Course Syllabus: September 2013

COURSE INFORMATION

Instructor:	Maren Oelbermann, Ph.D.
Office:	EV2, Room 2008
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Office Hours:	TBD
Lecture Times:	Thursday 1:30 to 3:30 pm
Location:	EV3-4412
Prerequisite:	A Course in Ecology

COURSE DESCRIPTION

This course examines the fundamental concepts of forest ecology and the role of forests in terrestrial ecosystems. The course will be divided into three sections, and will integrate case studies to introduce the student to current research problems in the study of forest ecology. Section I: People and Forests evaluates the impact of humans and a growing population on forest ecosystems. The dependence of humans on forest resources and the development of forestry and forestry practices will be discussed. Section II: Transfer, Cycling and Interactions of Energy and Nutrients will discuss the concept of ecosystems and its emergent properties, the transfer, storage and allocation of energy and nutrients (carbon, nitrogen, phosphorus etc.) and the effects of humans on these forest cycles. Interactions include the effects of solar radiation, temperature, water, wind, fire and soil on forest ecosystem productivity and diversity. Section III: Forest Management focuses on conventional and sustainable forest management practices, forest plantations, forest fragmentation, biodiversity and climate change. This course is available on D2L (Learn).

COURSE GOALS

- To introduce students to the importance of forests and their resources on human livelihoods
- To outline flows of energy and nutrients and introduce students to the ecosystem concept
- To introduce the major biophysical factors affecting forest ecosystem integrity and productivity
- To outline conventional and sustainable forest management practices

COURSE OBJECTIVES

By the end of the semester, students should be able to:

- Understand the intricate relationship between forests and people
- Have a basic knowledge of ecosystem concepts, the flow of energy and nutrients in forests, the biophysical factors affecting forest ecosystem productivity
- Outline the conventional and sustainable forest management practices

COURSE EVALUATION

Midterm:

- In-class midterm held on Thursday, October 24st, 2013 (1:30 pm to 3:00 pm)
- Worth 30% of the final mark
- Midterm covers lectures 1, 2, 3, 4 and 5; and all associated textbook chapters

Final Exam:

- The Final Exam is worth 40% of the final mark.
- The exam will be scheduled during the final examination period in December 2013.
- *Only in exceptional circumstances, and with official documentation, will a missed midterm or final exam be granted to be written at a later date.*

Assignment:

- Worth 30% of final mark. Outline posted on Learn.
- Due on Friday, November 8th, 2013 by 11:59 pm to the Learn Dropbox
- Late assignments will be *penalized 4 marks per day*. The final day of submitting the assignment is November 12th, 2013 at 11:59 pm. Any assignments submitted after this time will automatically receive a grade of zero (0).

COURSE TEXTBOOK (available in the UW Bookstore)

- Raymong A. Young and Ronald L. Giese. Introduction to Forest Ecosystem Science and Management, 3rd Edition.

COURSE SUBJECT MATERIAL

MODULE 1: PEOPLE AND FORESTS

LECTURE 1

Introduction

- Introduction to ERS 234: Forest Ecosystems and Management
- Course syllabus
- Course expectations

Sustainability of Forest Ecosystems (Introduction & Chapter 1)

- Introduction to forest ecosystem science and management
- Forest policy development in Canada
- Forest policy development in Canada

MODULE 2: FOREST BIOLOGY AND ECOLOGY

LECTURE 2

Forest Biomes of the World (Chapter 2)

- Factors affecting vegetation distribution
- Forest biomes
- Canadian forest ecozones
- Global change and forests

LECTURE 3

Landscape Ecology and Watershed Management (Chapter 7 & 16)

- Introduction
- Landscape patterns and their generation
- Influence of landscape patterns on forest ecosystems
- The watershed concept
- The hydrological cycle
- Global distribution of terrestrial water
- Integrated watershed management

LECTURE 4

Forest Ecophysiology (Chapter 4)

- Tree structure and function
- Environmental stresses
- Global issues in forest ecophysiology

LECTURE 5

Forest Soils (Chapter 5)

- Concept of forest soil
- Properties of forest soils
- Nutrient distribution and cycling in forest ecosystems
- Forest soils and tree nutrition
- Soil survey and classification
- Forest soils and environmental quality

LECTURE 6

Forest Ecosystem Ecology (Chapter 6)

- Concepts in systems ecology
- Forest tree species distribution
- The carbon cycle and forest growth
- The nutrient cycle
- Forest succession
- Effects of timber harvesting on forest ecosystems

MODULE 3: FOREST MANAGEMENT

LECTURE 7

Forest Wildlife Management (Chapter 14)

- Ecological interactions
- Wildlife as components of forest ecosystems
- Wildlife effects on forests
- Effects of forest management on wildlife
- Wildlife considerations in ecosystem management

LECTURE 8

Forest Fires (Chapter 18)

- Natural fire regimes
- Human influence on forest fire
- Fire behavior
- Fire prevention, control & prescribed burning
- Environmental Impacts of Forest Fires

LECTURE 9

Measuring and Monitoring Forest Resources (Chapter 11)

- Measurement of primary forest products
- Survey and mapping
- Measuring forest resources with a focus on timber
- Measurement of non-timber resources

LECTURES 10

Silviculture and Ecosystem Management (Chapters 13 & 19)

- Evolution of silvicultural practices
- Natural patterns of disturbance
- Growth and development of forest stands

- Treatments to improve existing stands
- Regeneration of forest stands
- Silvicultural systems
- Silvicultural practices and ecosystem integrity
- Ecological Forest Management (EFM)
- Timber harvesting techniques (Chapter 19)

MODULE 4: FORESTS AND SOCIETY

LECTURE 11

Social Forestry (Chapter 23)

- Global experience in social forestry
- Issues and challenges in social forestry
- Final exam review

STUDENT CONDUCT AND APPROPRIATE BEHAVIOUR

I encourage students to study together, however each student is expected to individually fulfill the requirements of the assignment, presentation, and exams. It is the responsibility of each student to be aware of what constitutes responsible behaviour in class, what constitutes plagiarism, and your rights and responsibilities with respect to these issues.

Academic Integrity: In order to maintain a culture of academic integrity, members of the University of Waterloo community are expected to promote honesty, trust, fairness, respect and responsibility. www.uwaterloo.ca/academicintegrity/. Students who are unsure what constitutes an academic offence are requested to visit the on-line tutorial at: <http://www.lib.uwaterloo.ca/ait/>

Note for students with disabilities: The Office for Persons with Disabilities (OPD), located in Needles Hall, Room 1132, collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with the OPD at the beginning of each academic term.

Grievance: A student who believes that a decision affecting some aspect of his/her university life has been unfair or unreasonable may have grounds for initiating a grievance. Read Policy 70 - Student Petitions and Grievances, Section 4, www.adm.uwaterloo.ca/infosec/Policies/policy70.htm. When in doubt, please contact your Undergraduate Advisor for details.

Discipline: A student is expected to know what constitutes academic integrity, to avoid committing academic offence, and to take responsibility for his/her actions. A student who is unsure whether an action constitutes an offense, or who needs help in learning how to avoid offenses (e.g., plagiarism, cheating) or about "rules" for group work/collaboration should seek guidance from the course professor, academic advisor, or the Undergraduate Associate Dean. For information on categories of offences and types of penalties, students should refer to Policy 71, Student Discipline, www.adm.uwaterloo.ca/infosec/Policies/policy71.htm. For typical penalties, check Guidelines for Assessment of Penalties, www.adm.uwaterloo.ca/infosec/guidelines/penaltyguidelines.htm

Appeals: A decision made or penalty imposed under Policy 70 - Student Petitions and Grievances (other than a petition) or Policy 71 - (Student Discipline) may be appealed if there is a ground. A student who believes he/she has a ground for an appeal should refer to Policy 72 (Student Appeals). See: www.adm.uwaterloo.ca/infosec/Policies/policy72.htm

Consequences of Academic Offences:

ENV students are strongly encouraged to review the material provided by the university's Academic Integrity office (see: <http://uwaterloo.ca/academicintegrity/Students/index.html>).