

Grande Prairie Regional College  
 Department of Science & Technology  
 Bachelor of Applied Forest Resource Management  
Course Outline (Fall 2000)

<b>Course:</b>	<i>Forest Ecology</i> (FO 2020) 3(3-0-3)	
<b>Classroom:</b>	E311	
<b>Lab:</b>	A209	
<b>Instructor:</b>	Weixing Tan, PhD	
<b>Office:</b>	E307	
<b>Phone:</b>	539-2793	
<b>E-mail:</b>	<a href="mailto:tan@gprc.ab.ca">tan@gprc.ab.ca</a>	
<b>Prerequisites:</b>	BI 2080, BT2400, FO1220(c)	
<b>Transfer Status:</b>	Athabasca University BIOL 2xx; Augustana University College BIO 2xx	
<b>Time of Lectures:</b>	Monday and Wednesday	10:00 - 11:20
<b>Time of Lab:</b>	Thursday	14:30 - 17:30

### Calender Description

The course examines the structure and function of forest ecosystems. Different levels of organization. Energy flow and productivity . Nutrient cycling within and between systems. Genetic aspects of ecosystems. Concept of succession and special role of fire. Autecology of important species.

### Textbook

Kimmins JP. 1996. **Forest Ecology**. Prentice Hall, Upper Saddle River, New Jersey.

### Major References

- 1) Barnes BV et al. 1998. **Forest Ecology**. 4<sup>th</sup> Edition. John Wiley and Sons. (reserved)
- 2) Terry D. 1994. **Forest Ecosystems**. University of John Hopkins Press. (reserved)
- 3) Waring RH and Schlesinger WH. 1985. **Forest Ecosystems: Concepts and Management**. Academic Press, Florida.

### Scientific Journals and Periodicals (available in the Library)

Canadian Journal of Forest Research  
 Forestry Chronicle  
 Northern Journal of Applied Forestry  
 Canadian Journal of Botany

### Useful Web Sites

[www.metla.fi](http://www.metla.fi); [www.canadian-forests.com](http://www.canadian-forests.com); [www.fs.fed.us](http://www.fs.fed.us); [www.forestnet.com](http://www.forestnet.com);  
[www.foresters.org](http://www.foresters.org); [www.forestindustry.com](http://www.forestindustry.com).

### Course Content

Forest Ecology (FO 2020) examines the structure and function of forest ecosystems. Since the course has strong links with Forest Ecosystem Management (FO 3670) and leads directly into Silviculture (FO 3130 and FO 3050), the practical applications and implications of forest ecology in ecosystem management are emphasized. The following lists the major topics to be addressed in this course and the required or suggested readings in two major books:

Topic	Readings (chapters)	
	Kimmins, 1996 (required)	Barnes et al. 1998 (suggested)
Definition and development of forest ecology	1 & 2	1
The role of forest ecology in forestry	1 & 2	1
The concept of forest ecosystem	3	2 & 3
Production Ecology (energy flow) and Forest Productivity <ul style="list-style-type: none"> <li>- Concept of food webs, GPP, NPP, crop, and yield</li> <li>- Determinants of forest productivity               <ul style="list-style-type: none"> <li>- Entry</li> <li>- transfer</li> <li>- storage</li> <li>- allocation</li> </ul> </li> <li>- Energy flow in detritus food web and relevance to decomposition</li> <li>- Impacts of forest harvesting on energy flow</li> </ul>	4	13 & 18

Nutrient cycling in ecosystems <ul style="list-style-type: none"> <li>- between ecosystems</li> <li>- within ecosystems</li> <li>- within individual tree</li> <li>- Nitrogen, the key element in many northern forests</li> <li>- Nutrient cycling and forest management</li> </ul>	5	19
Genetic aspects of forest ecosystems and implications for forest management	6	4
Abiotic (physical) environment in ecosystems and their importance to forestry	7, 8, 9 & 10	7, 8, 9, 10 & 11
The special role of fire	12	12
Autecology (or silvics) of major trees in Canada (part of the lab)	(References will be provided)	
Plant population ecology	13	5 & part of 15
Community ecology, biodiversity and forest practices	14	15 and 20
Forest succession	15	17 and part of 16
Forest ecosystem classification	16	part of 13
Recent issues in forest ecology	18 and 19	part of 21

## Requirements

Regular attendance to the lectures and participation in classroom discussion are highly recommended. Presence at each laboratory for this course is compulsory. A passing grade in the lab is required to pass the course. A medical note from your Doctor(s) is required for all excused absences. Mark will be deducted on the overdue lab report(s) at a rate of 10% per day.

## Evaluation

Quizzes/Assignments	16%
Lab Reports	20%
Midterm Exam	25%
Final Exam	39%
	100%

9-POINT GRADE	PERCENTAGE EQUIVALENT	DÉSIGNATION
9	90 - 100	EXCELLENT
8	80 - 89	
7	72 - 79	
6	65 - 71	GOOD
5	57 - 64	PASS
4	50 - 56	
3	45 - 49	
2	26 - 44	FAIL
1	0 - 25	

### Laboratory Schedule

WK	DATE	LAB #	DESCRIPTION
1	07/09	1	Introduction
2	14/09	2	Concept of Forest Ecosystem --- Ecological Analysis of Different Forest Types
3	21/09	2	(1) Pine dry site and black spruce muskeg (bog)
4	28/09		(2) Mixed-wood and pure aspen stands
5	(TBA)	3	Forest Succession after Clearcutting
6			--- A Field Study (a whole day lab)
7			
8	26/10		(Midterm exam week) No lab
9	02/11	4	Nutrient Cycling in Forest Ecosystem---Slide Demonstration and in-lab Worksheet
10	09/11	5	Autecology of Major Trees in Canada
11	16/11		
12	23/11	6	Presentations of Lab 5.
13	30/11	7	Ecological Computer Simulation (FORTOON)
14	07/12	8	Open Session

The detailed lab instruction will be distributed before each lab. Each student is expected to supply the following at each lab: **calculator**, pencils, eraser, some paper, and binder to hold data sheets. Please dress up for potential raining, cold weather during the field labs.