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1

Grande Prairie Regional College  
Department of Science & Technology  
Bachelor of Applied Forest Resource Management  
Course Outline  
Winter 2001

**Course:** *Plant Physiology* (BT 2400)  
**Classroom:** A304  
**Lab:** J107

**Instructor:** Dr. Weixing Tan  
**Office:** E307  
**Phone:** 539-2793  
**E-mail:** weixing.tan@gprc.ab.ca

**Lab Assistant:** Rick Scott

**Prerequisites:** BI 1080  
**Co-requisite:** CH 1610

**Transfer Status:** BT 240 at U of A, Sr. BOTA at U of C, BIOL 3xx at Athabasca University, and BIO 2xx at Augustana University College

**Time of Lectures:** Monday and Wednesday 10:00 - 11:20  
**Time of Lab:** Friday 8:30 - 11:20

### **Calender Description**

This course studies how plants grow, develop and respond to environmental influences and cultural treatments using trees as primary examples. Although the scope ranges from biochemical, cellular, tissue to whole plant level, emphasis is placed on the whole plant level. Major topics include: vegetative and reproductive growth, photosynthesis, respiration, nutrition, water relations (cell water relations, water absorption, movement, transpiration, and water balance), plant hormones, and stress physiology. Applications in forest resource management are emphasized.

### **Textbook**

Kozlowski TT and Pallardy SG. 1997. **Physiology of Woody Plants**. 2<sup>nd</sup> Edition. Academic Press, New York.

### **Major References**

- 1) Salisbury FB and Ross CW. 1992. **Plant Physiology**. 4th Edition. Wadsworth Publisher, Belmont, California
- 2) Hopkins WG. 1995. **Introduction to Plant Physiology**. John Wiley & Sons. New York.

- 3) Kozłowski TT and Kramer PJ. 1991. **The Physiological Ecology of Woody Plants.** Academic Press, New York.

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

Canadian Journal of Botany

Annual Review of Plant Physiology and Plant Molecular Biology

Canadian Journal of Forest Research

### Course Content

Subject (in sequence)		Chapter	
		Kozłowski & Pallardy (1997)	Salisbury & Ross (1992)
Introduction	Role of physiology in forestry	1	
	Cell water relations	11	2 & 3
Water Relations	Absorption	11	5
	Movement	11	5
	Transpiration and balance	12	4
	Photosynthesis	5	10, 11 & 12
Energy & Carbon	Respiration	6	13
	Translocation & storage	Part of 7	8
	Requirements	9, 10	6
Nutrition	Absorption	9	7
	Function	9, 10	6
Growth, development & regulation	Vegetative Growth	3	16
	Reproductive Growth	4	16
	Hormones	13	17 & 18
	Drought & nutrient	part of 13 & 10	26
Introduction to Stress Physiology (or Ecophysiology)	Temperature	part of 5 & 12	22 & 26
(Kozłowski, Kramer & Pallardy, 1991)	Soil compaction & flooding		

	Air pollution		
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### Requirements

Regular attendance to the lectures and participation in classroom discussion are required. 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.

### Laboratory Schedule

WK	DATE	LAB #	DESCRIPTION
1	13/01	1	Introduction
2	20/01	2	Cell and Tissue Water Relations
3	27/01	3	(1) Transpiration and Effects of Drought and Light (2) Xylem Tension with Pressure Chamber
4	02/02	4	Mineral Nutrition -- Starting
5	09/02	5	(1) Photosynthesis -- Video Show and Discussion
		4	(2) Initiation of Nutrient Treatment
6	16/02	6	Effects of Light Intensity on Photosynthesis using Infra-Red Gas Analyser (IRGA)
7	23/02		Midterm exam (no lab)
8	02/03		Winter break
9	09/03	7	Growth Rate and Photosynthetic Efficiency and Capacity in Willows
10	16/03	8	Hormones and Plant Root Growth and Leaf Senescence
11	23/03	4	Mineral Nutrition -- Final Harvesting
12	30/03	4	Data Analysis
13	06/04		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.

**Evaluation**

Quizzes/Assignments	18%
Lab Reports	25%
Midterm Exam	22%
Final Exam	35%
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	100%