

Grande Prairie Regional College
Department of Science & Technology
Bachelor of Applied Forest Resource Management
Course Outline
Winter 2002

Course:	<i>Plant Physiology</i> (BT 2400)	
Classroom:	B304	
Lab:	J126	
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	14:30 - 15:50
Time of Lab:	Thursday	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, the emphasis is placed on the whole plant physiology. 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 environmental impacts on trees (stress physiology). Applications in forest resource management are emphasized.

Required Textbook

Hopkins WG. 1999. *Introduction to Plant Physiology*. 2nd Edition, John Wiley & Sons, Inc., New York.

Major References (on reservation in the Library)

- 1) Kozlowski TT and Pallardy SG 1997 **Physiology of Woody Plants**. 2nd Edition. Academic Press, New York.
- 2) Salisbury FB and Ross CW. 1992. **Plant Physiology**. 4th Edition. Wadsworth Publisher, Belmont, California
- 3) Kozlowski 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 (on-line at www.nrc.ca)

Annual Review of Plant Physiology and Plant Molecular Biology

Canadian Journal of Forest Research (on-line at www.nrc.ca)**Course Content**

Subject (in sequence)		Week	Chapter	
			Hopkins (1999)	Kozlowski & Pallardy (1997)
Introduction	Role of plant physiology in forestry	Week 1		1
Water Relations	Cell water relations	Week 2	2	11
	Absorption	Week 3	3	11
	Movement		2 & 3	11
	Transpiration and balance	Week 4 & 5	3	12
Energy & Carbon	Photosynthesis	Week 6 & 7	7, 8, 9 & 10	5
	Translocation & storage	Week 7 & 8	11	6
	Respiration		12	Part of 7
	Carbon assimilation and productivity		13	
Nutrition	Requirements	Week 9	4	9, 10
	Absorption	Week 10	5	9
	Function		4 & 5	9, 10

Growth, development & regulation	Vegetative Growth	Week 11	15	3
	Reproductive Growth		15	4
	Hormones	Week 12	16	13
Introduction to Stress Physiology (or Ecophysiology) (Kozłowski, Kramer & Pallardy, 1991)	Drought & nutrient	Week 13	21 & 22	part of 13 & 10
	Temperature	Week 14 & 15		part of 5 & 12
	Soil compaction & flooding			
	Air pollution			
	Seedling quality			

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) and assignment(s) at a rate of 10% per day.

Evaluation

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

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

Laboratory Schedule

WK	DATE	LAB #	DESCRIPTION
1	10/01	1	Introduction
2	17/01	2	Cell and Tissue Water Relations
3	24/01	3	(1) Transpiration and Effects of Drought and Light (2) Xylem Tension with Pressure Chamber
4	31/01	4	Mineral Nutrition -- Starting
5	07/02	5	(1) Photosynthesis -- Video Show and Discussion (2) Initiation of Nutrient Treatment
6	14/02	6	Effects of Light Intensity on Photosynthesis using Infra-Red Gas Analyser (IRGA)
8	21/02		Midterm exam
9	28/02		Winter break
10	07/03	7	Growth Rate and Photosynthetic Efficiency and Capacity in Willows
11	14/03	8	Hormones and Plant Root Growth and Leaf Senescence
12	21/03	4	Mineral Nutrition -- Final Harvesting
13	28/03	4	Sample Weighting, Data Compilation and Analysis for Lab 4
14	04/04		
15	11/04	9	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.