Grande Prairie Regional College
Department of Science & Technology
Bachelor of Applied Forest Resource Management
Course Outline (Fall 2003)

Course	**Classroom**	**Lab**
Introduction to Soils (FO 1220) 3(3-0-3)	C316	TBA (J Wing)

Instructor	**Office**	**Phone**	**E-mail**
Weixing Tan, PhD & RPF	E307	539-2793	wtan@gprc.ab.ca

Prerequisites
First year Chemistry is recommended.

Transfer Status
University of Alberta Soils 210 (3 credits)

Time of Lecture
Tuesday and Thursday (8:30 – 9:50)

Time of Lab
Friday (14:30 - 17:20)

Calendar Description
The course has been designed to introduce fundamental concepts and processes of soils. The course covers the physical and chemical properties of soils; fertility, biology, geomorphology and the genesis and classification of soils.

Required Textbook
Juma N. 2001. **The Pedosphere and Its Dynamics: A Systems Approach in Soil Science**. Salman Productions, Edmonton, Alberta.

Major References
1) Brady, N.C., and Ray, R.W. 2002. **The Nature and Properties of Soils**, 13th edition. John Wiley and Sons, New York. (Available in library)
2) Beckingham, J.D., and Archibald, J.H. 1996. Field Guide to Ecosites of Northern Alberta. Canadian Forest Service, Northwest Region. (Available in library)

Scientific Journals
Canadian Journal of Soil Science (http://pubs.nrc-cnrc.gc.ca/aic-journals/)
Canadian Journal of Forest Research (http://pubs.nrc-cnrc.gc.ca/cgi-bin/rp/rp2_jour_e)

Useful Web Sites
http://res.agr.ca/CANSIS
http://129.128.55.165/rr/soa/index.cfm
http://www.pedosphere.com

Course Content

Topic	Week	Readings (Chapters)	
		Juma 2001 (required)	Brady & Ray 2002 (suggested)
Introduction – What is soil and why do we need to study it?	Week 1	1	1
Functions of soil in our ecosystem	Week 2	2	1
Soil formation – forming factors, weathering, parent materials, impact of landforms, horizon development, horizon descriptions (CSSC).	Week 3-4	4	2
Soil classification – Canadian Soil Classification System, soil type classification of Alberta Ecosites	Week 5	5	4
Soil physical properties – texture, structure, density, color and pore space.	Week 6-7	3	4
Soil colloids and chemical properties – Introduction to soil colloids, exchange complex dynamics, pH and buffering capacity, nutrient availability	Week 7-8	Part of 6 & 7	8 & 9
Soil water – properties, classification, water content and potential, water movement, soil-plant-atmosphere continuum.	Week 8-9	8	5 & 6
Soil air – soil atmosphere and aeration, gas transport, oxidation-reduction (Redox) potential, factors affecting soil aeration.	Week 10	9	Part of 7
Soil organisms and ecology – Diversity and abundance, conditions affecting the growth, beneficial effects, ecological relationships	Week 11	10	11
Soil organic matter – The global carbon cycle, properties of soil organic matter, decomposition & mineralization, nutrient cycling, factors controlling rates of decomposition & mineralization.	Week 12 & 13	11	12
1) Introduction to soil survey 2) Class review	Week 14	12	Part of 19
Final exam	Week 15		

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 20% per day.

Evaluation (relative percentage)

Quizzes/Assignments	20%
Lab Reports	20%
Midterm Exam	25%
Final Exam	35%
	100%

Alpha Grade	***4-Point Equivalent***	***Designation***
A+	4.0	*Excellent*
A	4.0	
A-	3.7	*First Class Standing*
B+	3.3	
B	3.0	*Good*
B-	2.7	
C+	2.3	*Satisfactory*
C	2.0	
C-	1.7	
D+	1.3	*Minimal Pass*
D	1.0	
F	0.0	*Fail*

Laboratory

The labs consist of great outdoor exercises, indoor analysis and computer learning. The outdoor labs will involve observation of a set of sites that have differing vegetation, parent geologic material, and microclimate. Soils will be evaluated on the basis of several physical attributes that will be explained and horizons will be sampled for later indoor analysis. The field observations will later be compiled with data gained from the indoor analysis with the ultimate goal of identifying soils and their potential limitations/opportunities for plant growth at each site, citing distinct diagnostic properties that allow identification.

Tentative Schedule

WK	DATE	LAB #	DESCRIPTION
1	05/09	1	Introduction
2	12/09	2	Agriculture soil - demonstration and exercise in field examination
3	19/09	3	Different Soils and parent materials along Wapiti River - continued demonstration and exercise
4	26/09	4	Soil at Kleskun Hill Park
5	03/10	5	Soils at sand dune and muskeg
6	10/10		
7	17/10	6	Soils at balsam poplar and aspen stands
8	24/10		(Midterm exam week)
9	31/10	6	Soils at balsam poplar and aspen stands
10	07/11	7	Analysis of soil texture and structure
11	14/11	8	Analysis of soil chemical properties
12	21/11	9	Analysis of diagnostic properties for identification
13	28/11	10	Open Session
14	05/12	11	Computer lab – Soils Alberta Tutorial
15	12/12		Final Exam Week

The detailed lab instruction will be distributed before each lab. Please dress up accordingly for potential raining, cold weather during the field labs.