GRANDE PRAIRIE REGIONAL COLLEGE

DEPARTMENT OF SCIENCE AND TECHNOLOGY

UNBC transfer course

DIVERSITY OF HIGHER PLANTS: FO1200

Pre-requisite: Biology 30

Calendar Description:
Identification, classification and distribution of forest trees of Canada. Identification and classification of shrubs and herbs from different forest communities. Identifications of local species are made in the field during field labs. Overview of plant families commonly found in Alberta and B.C. Silvics of major Alberta and B.C. tree genera. Delineation of forest regions of the world, North America and Canada and their major tree species.

Instructor: Albert Sproule
Office: E310/C203
Phone: 539 2061
Email: albertsproule@yahoo.ca

Lectures:	Tues. and Thurs.	10:00 – 11:20	B202
Lab:	Fri.	14:30 – 17:30	Field - then B305

Texts: **Required:**

Johnson, Kershaw, MacKinnon & Pojar. 1995. **Plants of the Western Boreal Forest & Aspen Parkland**. Lone Pine Publishing. 392 p.

MacKinnon , Pojar & Coupe. 1992. **Plants of Northern British Columbia**. B.C. Ministry of Forests & Lone Pine Publishing.

Optional: (available in the library or on the Internet)

Burns, R.M. and Honkala, B.H. 1990. Silvics of North America (Vol. I and II) Agriculture Handbook 654, USDA Forest Serv., Washington, D.C. (available at http://www.na.fs.fed.us/spfo/pubs/silvics_manual/table_of_contents.htm)

Farrar, J.L. 1995. **Trees in Canada**. Fitzhenry & Whiteside Ltd. & The Canadian Forest Service.

Knowles, H. (1995). **Woody Ornamentals of the Prairies**. U. of A. Edmonton.

Beckingham & Archibald. **Field Guide to Ecosites of Northern Alberta**. Special Report #5. Canadian Forest Service, Northwest Region. Northern Forestry Centre. 1996.

Ringius and Sims. 1996. **Indicator Plant Species in Canadian Forests**. Canadian Forest Service.

Website
www.canadian-forests.com
www.fs.fed.us

Course Objectives:

- To be able to identify the common trees/shrubs/forbs growing in the boreal regions of Alberta and British Columbia and their ecological characteristics.
- To know the major forest regions of North America and their major tree species.
- To understand the basic biology of trees and shrubs:
  - morphology of vegetative parts;
  - reproductive morphology
  - basic genetics
  - ecology.

Course Outline:

- The major emphasis during lectures will be on:
  - the basic biology/ecology of plant families commonly found in Alberta and B.C.
  - detailed silvics of major tree species from Alberta/B.C.
- The major lab emphasis in the course is on plant identification. Labs early in the term (before the onset of winter) will consist of field trips in and around Grande Prairie. During these labs we will concentrate on recognition/identification of plant species. Students will be expected to identify the plants from either fresh twigs, leaves, bark, fruits, etc. or from lab mounts. Latin names and families will be emphasized. Students are expected to follow the correct method of writing the Latin names, i.e. underline Genus and species and capitalize the Generic name. Indoor labs, later in the term, will cover tree identification based on wood anatomy and cellular structure.

Lab quizzes will be held each week. These will be chiefly on the plants learnt during the most recent lab, but may also include species learnt during any previous lab. The best 9 (of 10) lab quizzes will count towards the final grade. **There will be no make-up quizzes**.

The mid-term lecture exam will be held during a lecture session. The final lecture exam will be held during regularly scheduled college exams.

A mid-term lab exam will be held during the October 7th lab session. The final lab exam will be held on December 9th, also during the regular lab period.

Grading:

The various assignments and exams will be assigned the following weights:

Weekly lab quizzes (best 9 of 10)	30%
Midterm lecture exam	15%
Midterm lab exam	10%
Plant herbarium	10%
Final lecture exam	20%
Final lab exam (conducted during final exam schedule)	15%
Total	100%

GPRC DIVERSITY OF PLANTS LECTURE SCHEDULE

TOPIC	HOURS	WEEK
INTRODUCTION **Classification systems** Why classification systems are needed. Nomenclature – the binomial system, how it works. **Applications of Dendrology** Site classification. Forest health information. Identification of noxious weeds.	**3**	**1**
Characteristics of major plant divisions: (Review of material covered in BI1080). Diploid and haploid phases – the changing significance of the gametophyte and sporophyte generations in the different plant groups.	**3**	**2**
Plant collection Importance of collecting. How to collect – documentation. Pressing. Importance of the reference collection. **Keys** How to use them.	**3**	**3**
INDICATOR PLANTS How to recognize. Their usefulness. Reference to the "Field Guide to Ecosites of Northern Alberta."	**2**	**4**
BASIC BIOLOGY AND TERMINOLOGY OF COMMON ALBERTA AND B.C. FAMILIES OF ANGIOSPERM TREES, SHRUBS AND FORBS: DIAGNOSTIC FEATURES, USES, DISTRIBUTION AND IMPORTANCE ➢ General morphology – overall appearance ➢ Leaves. ➢ Flowers. • Flower structure • Parts of a flower – the floral formula ➢ Fruits. • Sexual vs asexual reproduction • Seed production • Dormancy • Longevity	**13**	**5–8**

- Genetics
  - Ploidy
  - Natural selection
  - Co-evolution
- Alternation of generations
  - Revision of the gametophyte and sporophyte phases in higher plants
- Dendrochronology.

ECOLOGY OF MAJOR ALBERTA AND B.C. TREE GENERA **10** **9–13**

Detailed consideration of:

Pinus
Larix
Populus/Betula
Picea
Pseudotsuga
Abies
Tsuga
Thuja

Coverage includes:

- Habitat
  - Range
  - Soils/topography
- Adaptation to the environment – tolerance to:
  - Shade
  - Drought
  - Fire
  - Snow
  - Wind
- Regeneration
- Damage agents
- Economic value

FORESTED REGIONS: **4** **13–14**

Overview of regional climate, major species and uses.
Global.
North American.
Canadian

GPRC DIVERSITY OF PLANTS LAB SCHEDULE

Lab	Location	Topic	Quiz
1	**Field**	Woody plants of a black spruce bog *(Details of student plant collection to be handed in during final lab).*	
2	**Field**	Canfor Trail - trees and shrubs of the aspen grove section of the boreal forest	**#1**
3	**Field**	Reservoir banks - trees and shrubs of river valleys of Alberta	**#2**
4	**Field**	Wapiti ski trails - trees and shrubs of the aspen grove section of the boreal forest	**#3**
5	**Field**	Mosses and lichens – old ski trails	**#4**
6	**Field**	Jubilee Park – hardwoods and ornamentals	**#5**
7	**Indoor**	Mid-term lab exam (during lecture period)	
8	**Field**	Southside G.P. – hardwoods and ornamentals	**#6**
9	**Field**	Indicator plant review lab – visit to different communities	**#7**
10	**Field**	Beaverlodge Research Station – Conifers I	**#8**
11	**Field**	Winter twigs	**#9**
12	**Indoor**	Review of root, stem and leaf anatomy and relationship to function in monocots and dicots (herbaceous and woody).	**#10 (during lecture period)**
13	**Indoor**	Keys: How to construct them.	
14	**Indoor**	Herbarium collection	

Plant Herbariums

Students are expected to collect and press plants from the first seven labs. A good specimen consists of a twig, a leaf and possibly flowers or fruit (if still in season). Plants should be labelled and the location of the specimen should also be noted. Audrey will suggest some ways of keeping your collection:

Lab Quizzes

For the outdoor labs, you will have to identify 10 plants, worth 10 points each. Emphasis will be on the plants learnt in the most recent lab, however plants from any lab could be included.

Point structure - total of 10 points

Genus (4)	species (2)
Family (2)	
common name (2)	

Deductions:

Misspelled word = -1 (per word)
Genus or species not underlined (or in italics) = -1 (per word)
Family or Genus: first letter not capitalized = -1 (per word)
Common name not capitalized (if needed) = -1

Note: Please do not write all words in capital letters.