GRANDE PRAIRIE REGIONAL COLLEGE

DEPARTMENT OF SCIENCE AND TECHNOLOGY

Bachelor of Applied Forest Resource Management

SILVICULTURE II: FO3050

Transfer status: Under discussion

Pre-requisite: Silviculture I (FO3130)

Calender Description:
Major topics will be tree improvement and stand density management. Other topics will include intensive management, forest microsites, plantation forestry, mixed-wood management, use of exotic species. Students will be required to make presentations and participate in discussions.

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Lectures:	Monday, Wednesday:	11:30 – 12:50	A209
Lab:	Monday	14:30 – 14:30	B305

Course Description:
Advanced silviculture takes some of the basic silvicultural techniques that we studied in 2nd year and studies them to a greater depth. We will study silviculture from the perspectives of:

- world-wide advances in some areas, e.g.:
  - mycorrhizae and their possible role as an aid to reforestation.

- the application of techniques used elsewhere, but relatively new to Alberta, e.g.:
  - the implementation of the 'free-to-grow' concept.
  - genetic improvement
  - stand density management.
  - partial-cut harvest systems
  - use of exotic species
  - drainage

- the development of techniques specific to the Alberta/western Canada situation, e.g.:
  - site preparation in the boreal forest
  - mixed-wood (aspen/spruce) management.

Four over-riding themes of the course will be:
(a) the most effective areas on which to concentrate our 'silvicultural efforts'
(b) enhanced (intensive) forest management
(c) the 'benefit/cost' aspect of silviculture strategies
(d) the need to monitor our silvicultural efforts, not only in terms of tree growth rates but also the effects in areas such as wood quality, pest population dynamic's, effects on site quality.
(e) the need to keep nature's methods in mind

Textbooks Available in the Library

Compendium of Canadian Forestry Statistics. (1996). Canadian Council of Forest Ministers.
Field Guide to Ecosites of Alberta. (Series of four publications).
Forest Site Interpretation and Silvicultural Guideline for Alberta. (1996). Alberta Environmental Protection.
Hartl. D.L. (1980). Principles of Population Genetics. Sinauer.
Hartl. D.L. (1981). A Primer of Population Genetics. Sinauer.
Lavender, D. (1994). Regenerating British Columbia's Forests.UBC Press, Vancouver. 372 pp.
Matthews, J.D. (1989). Silvicultural Systems. Oxford University Press, Oxford. 284 pp.
Morgenstern, E.K. (1996). Geographic variation in forest trees: genetic basis and applicaion of knowledge in silviculture. UBC Press.
Smith, D.M., Larson, B.C., Kelty, M.J. and P.M.S. Ashton. (1997). The Practice of Silviculture - Applied Forest Ecology. John Wiley & Sons, Inc. Toronto. 537 pp.
Wright, J. (1976). Forest Genetics. Academic Press.
Zobel, B. (1984). Applied Forest Tree Improvement. Wiley.

Scientific Journals and Periodicals Available in the Library

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

Website

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

EXAMINATIONS AND MARK ALLOCATION

Mid-term examination	35%
Assignments, presentations, labs.	25%
Final examination	40%

LECTURE SCHEDULE

Overview of the course — **1 lecture**

Philosophy of silvicultural advances — **1 lecture**
- where to concentrate our efforts
  - biological vs economic concerns
- keeping nature in mind
- forestry as an investment

The nursery operation — **1 lecture**
- current nursery strategy and practice
- the 'designed' seedling

Silviculture and harvesting systems — **2 lectures**
- clear cut
- seed tree
- shelterwood
- selection
- coppice

Outplanting — **2 lectures**
- the narrow 'nursery-to-site' window
- methods of site preparation
- stock type, microsite, planting quality
- the role of mycorrhizae
- survival surveys and early tending
- the free-to-grow concept

Stand density management — **4 lectures**
- what is stand density management?
- history in Europe, then to North America
- applicability in Western Canada
- pros and cons
- stand density management and the AAC!

Mixedwood management — **2 lectures**
- history
- present-day context
- difficulties; biological, economic and political
- possible future directions

Aspen management — **2 lectures**
- is it really necessary?
- results of recent research
- possible future directions

Genetic tree improvement programs — **6 lectures**
- basics of forest genetics
- mechanics of a tree-improvement program
- use of genetically-improved stock in operational forestry
- the silvicultural component of a tree-improvement program
- future directions in tree-improvement programs

The role of exotic species — **1 lecture**

Site improvement techniques — **1 lecture**
- drainage
- fertilization

LAB SCHEDULE — WINTER 2000

Lab I **Extraction and treatment of lodgepole pine seed**

Lab II **Seeding in styrofoam blocks**

Lab III **Field lab:**
Superior stand selection

Lab IV **Field lab:**
Harvesting systems

Lab V **Field lab:**
Harvesting systems

Lab VI **Presentations:**
Case studies

Lab VII **Presentations:**
Case studies

Lab VIII **Thinning**

Lab IX **Genetic improvement program at Weyerhaueser:**
Slide presentation by John Edwards
(Weyerhaueser, Grande Prairie, Ltd)

Lab X **Field lab:**
Visit to Huallen seed orchard

Lab XI **Seedling assessment:**

1. Seedlings from four different seedlots (genetic testing).
2. Seedlings from the same seedlot with three different treatments (Labs I and II)

Note: During field labs students are expected to observe the particular forestry operation and also to understand the biological principles underlying the particular methodology. It is essential to keep good, up-to-date, notes of all field labs.