GRANDE PRAIRIE REGIONAL COLLEGE

DEPARTMENT OF SCIENCE AND TECHNOLOGY

Bachelor of Applied Forest Resource Management

FOREST FIRE MANAGEMENT: FO3270

Transfer status: Under discussion

Pre-requisite: Forest Ecology (FO2020)

Calender Description:
The natural role of fire. Physics and chemistry of combustion. Fire behaviour, prediction, detection, suppression, prevention, control. Fuel types and fuel cycles. Fire danger rating. The elements of a fire control program. Prescribed burning.

Instructor: Albert Sproule
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Lectures: Monday, Wednesday, Friday 11:00 - 11:50
Lab: Monday 15:00 - 18:00

Course Description:
The course reviews the attitudes to and the history of fire in Alberta. From being regarded as an unavoidable evil to the present ecosystem management strategy of trying to replicate the effects of fire.
The phases of combustion:

- preignition
- ignition
- combustion
- extinction

are examined in relation to the chemistry and physics of fuels.
Fire behaviour is considered as a function of:

- fuel state and abundance
- season
- wind
- topography

The ecological role of fire is looked at from a historical perspective. We will compare Tansley's pyral climax theory with Clement's monoclimax theory.
The special role of fire in the historical development of the lodgepole pine, jack pine and mixedwood forests of Alberta is compared with modern practices and beliefs. Fire dependent ecosystems are examined in terms of morphological and reproductive adaptations.

The history of fire as a cultural tool in Canada is traced from the European settlers to the present and fitted into the global scene.
The structure of fire management programs are viewed in general and the Alberta model in particular.
We will discuss the elements of a control program:

- prevention
- detection
- communication.

Fire suppression is looked at, with particular emphasis on safety in fire fighting.
Finally, we will discuss the use of fire as a silvicultural tool. Its strengths and also its weaknesses which have virtually eliminated its use in some jurisdictions.

TEXTS AND REFERENCES

RECOMMENDED

Pyne, S.J. 1996. Introduction to wildland fire. John Wiley & Sons, Inc. Toronto. 769 pp.

TEXTS AVAILABLE IN THE LIBRARY

Alexander, M.E. and G.F. Bisgrove. 1990. The art and science of fire management. Can. For. Serv., North. For. Cent., Edmonton. Inf. Rep. NOR-X-309. 333 pp.
Chandler, C., Cheney, P., Thomas, P., Trabaud, L. and D. Williams. 1983. Fire in Forestry, Forest fire management and organization. 2 Vols. John Wiley & Sons, Inc. Toronto. 450 pp., 98 pp.
Compendium of Canadian Forestry Statistics. (1996). Canadian Council of Forest Ministers.
Kimmins, J.P. 1997. Forest Ecology. Prentice Hall, New Jersey. Pages 296-314.
Murphy, P.J. 1985. History of forest and prairie fire control policy in Alberta. Alta En. And Nat. Res. Edmonton. ENR Report number; T/77. 408 pp.
Taylor, S.W., Pike, R.G. and M.E. Alexander. 1997. Field guide to the Canadian forest fire behaviour (FBP) prediction system. Can. For. Serv., North. For. Cent., Edmonton. Special Report 11. 60 pp.

SCIENTIFIC JOURNALS AND PERIODICALS AVAILABLE IN THE LIBRARY

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

EXAMINATIONS

Midterm	35%
Assignments, reports, quizzes	30%
Final exam	35%

LECTURE SCHEDULE

The role of fire in the natural forest — **1 lecture**
- the changing situation in Alberta

The nature of fire — **3 lectures**
- phases of combustion
- physics and chemistry of fuels

Fire behaviour — **6 lectures**
- how fires grow and spread
- distribution of fires

Wildland fuels — **3 lectures**
- characteristics and histories

Fire weather — **4 lectures**
- importance of weather information in a fire danger rating system

Fire ecology — **4 lectures**
- species adapted to fire
- Tansley's pyral climax theory
- the effects of fire (or its absence) on succession

Cultural aspects of fire — **3 lectures**
- traditional
- current

Fire management — **2 lectures**
- historical, economic and political considerations
- fire management structure in Alberta

The elements of a fire management program — **5 lectures**
- prevention, detection, communication
- management of the fuel load

Fire suppression — **6 lectures**
- evolution of control methods
- the resources, manpower and equipment
- organization of suppression activities
- safety in fire fighting

Prescribed fire — **3 lectures**
- its different uses
- techniques and tactics

LABS

Lab I	Fire history in Alberta, data entry, spread-sheet presentation, charts, analysis.
Lab II	"
Lab III	Videos of general fire interest.
Lab IV	Fire behaviour - videos, CD ROM, computer simulation, User's guide to Canadian Forest Fire Behaviour System.
Lab V	"
Lab VI	"
Lab VII	"
Lab VIII	"
Lab IX	Fire control programs - videos
Lab X	Prescribed fire - videos