

GRANDE PRAIRIE REGIONAL COLLEGE

DEPARTMENT OF SCIENCE AND TECHNOLOGY

Bachelor of Applied Forest Resource Management

FOREST MENSURATION II: FO4280

Pre-requisite: FO 2370 (Mensuration I)

Calendar Description:

Forest inventory methods. Sampling technique and design. Measurement of non-timber forest resources.

Instructor: Albert Sproule
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Lectures: Tuesday and Thursday: 14:30 – 15:50 G118

Course Description:

Forest mensuration is defined (Young and Giese, 1990) as “the science dealing with the measurement of volume, growth and development of individual trees and stands and the determination of various products obtainable from them”. The ‘various products’ refers to fibre products and also to other forest values such as recreation, wildlife.

Our course will deal with the methodology of data collection during a mensuration exercise, i.e. an inventory or timber cruise. Also, in the concept of present-day forestry, it will lead us to consideration of inventories of other forest resources such as wildlife and recreation.

We will study the planning of forest inventories and the different sampling techniques and designs used in collecting inventory data:

- Review of the concept of sampling and sampling terminology.
- Temporary versus permanent sample plots.
- Acceptable levels of error in collected data.
- Sample design:
 - Probability sampling
 - random sampling
 - stratified random sampling
 - multistage sampling
 - multiphase, including ‘double’ sampling
 - Non-random sampling
 - selective sampling
 - systematic sampling
- Estimation of required plot numbers and plot sizes.
- Precision and accuracy.

- Statistical implications of probability versus non-random sampling.
- Sampling with replacement versus sampling with no replacement.
- Point sampling versus fixed area sampling.

Throughout the course students will be kept apprised of the various mensurational strategies and methodologies currently used in the forest industry.

TEXTS AND REFERENCES

RECOMMENDED

Freese, F. (1962). Elementary Forest Sampling. U.S. Dept. Agric. Handbook # 232.

TEXTS AVAILABLE IN THE LIBRARY

Avery, T.A. and H.E. Burkhardt. (1994). Forest Measurements. 4th Ed. McGraw-Hill, New York. 408 pp.

Husch, B., Miller, C.I. and T.W Beers. (1993). Forest Mensuration. Krieger Publishing Company, Malabar, Florida. 402 pp.

Cochran, W.G. (1977). Sampling Techniques. John Wiley & Sons, New York.

Compendium of Canadian Forestry Statistics. (1996). Canadian Council of Forest Ministers.

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

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| Mid-term examination | 30% |
| assignments, reports, quizzes | 35% |
| Final examination | 35% |

LECTURE SCHEDULE

| | |
|---------------------|---|
| week 1. | Overview of sampling in forestry |
| weeks 2,3 | Stratified random sampling |
| weeks 4,5 | Regression estimators |
| weeks 6,7 | Family of regression estimators <ul style="list-style-type: none">• Ratio-of-means estimator• Mean-of-ratios estimator |
| week 8 | Double sampling |
| week 9 | Cluster sampling |
| week 10 | Two-stage sampling |
| week 11 | Sampling for discrete variables |
| weeks 12, 13 | Horizontal point (angle-guage) sampling |
| week 14 | 3P sampling |
| week 15 | General comments on surveying/inventory |