

SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

Course Title: WATERSHED MANAGEMENT

Code No.: FOR 318-4


Program: WATER RESOURCES TECHNOLOGY

Semester: VARIOUS

Date: JANUARY, 1989

Author: B. CURRELL

New: _____ Revision: X

APPROVED: 
Chairperson

Dec 22/88
Date

**WATERSHED MANAGEMENT
FOR 318-4**

WATERSHED MANAGEMENT

FOR 318-4

Course Name

Course Number

PHILOSOPHY/GOALS:

A practical course designed for field personnel to provide information on water management and methods to assist in minimizing erosion and sedimentation on land undergoing development.

METHOD OF ASSESSMENT (GRADING METHOD)

Unit Tests (3) 50%

Assignments (5) 50%

A total of three unit tests based on lecture material will be written at the completion of units 2, 4 and 6 and, will account for 50% of the course work.

A series of six assignments will be handed in, valued at 50%. All assignments must be handed in to pass the course though marks for only the best 5 will be calculated in the final grade.

Reports are due two weeks after assigned; a total of 10% will be deducted for every day late. Reports submitted after 1 week after the due date will receive 0.

Marks are cumulative and 60% is considered a pass. If a final grade of less than 60% is received, a test based on the entire course material may be written during the rewrite period providing student effort and attendance have been satisfactory.

A+ = 90% A = 80-89% B = 70-79% C = 60-69%

TEXTBOOK(S) SUGGESTED:

Stream Enhancement Guide, 1980, Fisheries and Oceans and Ministry of the Environment, Province of British Columbia

Great Lakes Shore Processes and Shore Protection, 1987, Ontario Ministry of Natural Resources

Others as assigned.

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UNIT #1 Important Physical Properties of Water Affecting Management

- density relationships
- thermal and oxygen stratification
- zonation of lakes and productivity
- wind action, waves and seiches
- temperate streams
- river meanders and particle movement

Assignment 1 - Lake Productivity

UNIT #2 Control of Runoff in Watersheds

- basic run-off equation
- control of run-off by vegetation and proper management practices
- role of natural and artificial impoundments, reservoirs and pond
- construction of impoundments and ponds for private watersheds

Assignment 2 - Role of Beavers in Watersheds
- Pond Construction

UNIT TEST #1

UNIT #3 The Aquatic Community and its Habitat

- invertebrates and key vertebrates and their biological requirements to survive
- biological indicator species

Assignment 3 - Biological indicators

UNIT #4 Stream Improvement Measures

- problem situations in streams
- erosion control
- streamside improvements
- stream channel improvements
- stream flow control

Assignment 4 - Stream Enhancement Planning

UNIT TEST 2

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UNIT #5 - Forestry Practices and Watershed Management

- types of logging practices
- effects of logging on aquatic environments
- proper logging practices to minimize damage
- construction of resource roads, stream crossings, and culvert installation

Assignment 5 - Application of the Principles of Forest Harvesting and Road Construction to Minimize Environmental Damage

UNIT #6 - Shore Processes and Shore Protection

- shore features and processes
- shore protection; criteria and guidelines
- legalities of shore protection devices

Assignment 6 - Report on Shore Processes and Shoreline Protection Measures

UNIT #7 Water Pollution Concerns

- effects of major organic and inorganic pollutants on water use and the watershed.

All field trips are compulsory. Students missing field trips without documentation will receive an automatic 0 for the corresponding technical report.

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REPORT WRITING

General

- type on standard sized typing paper
- leave margins at least 1" at each side for instructor's comments
- double space
- be brief and concise
- underline all scientific names
- do not use I, me, you, we, our, etc.
- be sure all tables and figures are correctly numbered and labelled
- refer to tables and figures by number

Example:

Table 10. Population numbers of caribou on Pribilof Isl.

| Year | Estimated Number |
|------|------------------|
| 1956 | 6 |
| 1957 | 10 |
| 1958 | 14 |
| 1959 | 19 |
| 1960 | 27 |
| 1961 | * no data |
| 1962 | 37 |

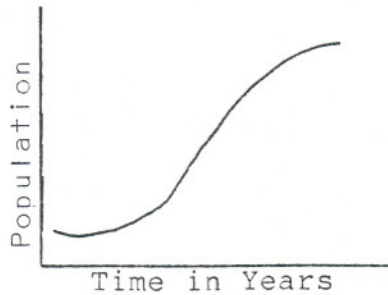


Fig. #1 - Theoretical Population Growth Curve

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References

- presented on a separate page at end of report,

1) For paper presented in a Journal:

Mason, C.F. and R. J. Bryant. 1974. The structure and diversity of the animal communities, J. Zool., 172, 289-309.

1 1
issue no. page reference

2) For book references:

Hynes, H. B. N., 1970. The Ecology of Running Waters, Liverpool University Press, Liverpool.

| Year | Estimated Number |
|------|------------------|
| 1954 | 6 |
| 1957 | 10 |
| 1958 | 14 |
| 1959 | 19 |
| 1960 | 27 |
| 1961 | * no data |
| 1962 | 37 |



Fig. 11 - Theoretical Population Growth Curve

REFERENCES

Case, A.B. and D.A. Rowe. 1978. Environmental Guidelines for Resource Road Construction. Fisheries and Environment Canada, Forestry Service.

Clemens, Robert H., No date. The Role of Vegetation in Shoreline Management. A guide for Great Lakes shoreline property owners. Fisheries and Environment Canada, Dept. of Army Corps of Engineers, North Central Division.

Kerr Wood Leidal Associates Ltd. and D.B. Lister and Associates Ltd. 1980. Stream Enhancement Guide. Fisheries and Oceans and Ministry of Environment, Province of British Columbia.

Ontario Conservation Authorities. 1981. Erosion Control. Conservation Services Manual Volume I. ISBN 0-7743-7067-X.

Ontario Ministry of Natural Resources. 1982. Building a Dam and other Water Projects.

Ontario Ministry of Natural Resources. 1981. Great Lakes Shore Processes and Shore Protection.

Rothwell, R.L. 1978. Watershed Management Guidelines for Logging & Road Construction in Alberta. Northern Forest Research Centre. Canadian Forestry Service, Fisheries & Environment Canada, Edmonton, Alberta.

U.S. Army Corps of Engineers, North Central Division. 1978. Help Yourself - A discussion of erosion problems on the Great Lakes and alternative methods of shore protection.

U.S. Army Corps of Engineers. 1973. Shore Protection Manual. Vol 1-3. Coastal Engineering Research Center, Ft. Belvoir, Virginia.

U.S. Army Corps of Engineers. No date. Low Cost Shore Protection - A Property Owner's Guide.

U.S. Department of Agriculture, Forestry Service. 1966. Wildlife Habitat Improvement Handbook. Forestry Service, Washington. FSH 2609.11:146 pp.

U.S. Department of Transportation. Federal Highway Administration. 1979. Restoration of Fish Habitat in Relocated Streams. U.S. Government Printing Office, Washington, D.C. 20402. FHWA-1P-79-3.

