

I. COURSE DESCRIPTION:

This course will provide the biological background for management of wetland habitats, emphasizing aquatic community component identification, biology and management. Students will learn how to evaluate wetlands, assess their limitations, and research and design a plan for their enhancement to optimize recreational, social, aesthetic and economic values.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

Upon successful completion of this course, the CICE student, with the assistance of a Learning Specialist will demonstrate a basic ability to:

1. ***Understand the classes of wetlands in Canada, and the ecological characteristics of each class.***
 - Potential Elements of the Performance:
 - Research the classes of wetlands from reference material
 - Summarize 4 characteristics of each wetland class
 - Describe the values of each wetland class and potential reasons for wetland loss
 - Divide class into 5 groups to represent each wetland class and summarize their findings in a "workshop format"
 - ***This outcome will constitute approximately 10% of final grade***
2. ***Identify and discuss the role of the biological component of wetlands.***

Potential Elements of the Performance:

- Review written reports on the role of indicator species in wetlands (from "readings" study manual) and complete response sheets
- Using actual specimens, study skins, slides or visual materials, identify indicator species of amphibians, reptiles, macro-invertebrates, aquatic plants, birds and mammals commonly found in wetlands.
- Fill in the data sheet assignment (from study manual) to describe the identifying features, sites and roles of the above species.
- ***This outcome will constitute approximately 35% of final grade***

3. ***Assist in the evaluation and submit a written assessment form for one or more local wetland(s) by the Environment Canada/ Ministry of Natural Resources "Ontario Wetland Habitat Evaluation" survey technique.***

Potential Elements of the Performance:

- Review the procedures described in the Ontario Wetland Habitat Evaluation manual (Northern Region)
 - Assist in conducting a field survey of a wetland using the above procedure while at field camp
 - Observe the maps and forms required for this survey after returning to the College
 - Compare the Ducks Unlimited wetland evaluation and other wetland evaluation systems to this survey in terms of methodology, time requirements and results.
 - ***This outcome will constitute approximately 25% of final grade***
4. ***Compare physical, chemical, and biological methods of vegetation management in wetlands in terms of methods of application, economic and ecological costs and public acceptance***

Potential Elements of the Performance:

- Review the assigned readings on vegetation management, and discuss why vegetation and vegetation control may constitute a problem to managers
 - In an in-class brainstorming session
 - Discuss and rate the advantages of the methods of physical vegetation control
 - Discuss and rate the advantages of the methods of chemical vegetation control.
 - Discuss and rate the advantages of the methods of biological vegetation control.
 - Prepare a chart to summarize the above
 - ***This outcome will constitute approximately 10% of final grade***
5. ***Discuss the merits and drawbacks of various methods of water-level control.***

Potential elements of the performance:

- Review the assigned readings to assess the purpose and types of water level manipulation and control
- Discuss in class the relative merits and draw-backs of various control devices
- ***This outcome will constitute approximately 10% of final grade***

6. ***As a group, develop a wetland management plan designed to improve an existing wetland for waterfowl, fur-bearers and resource users.***

Potential elements of the performance:

- Select a local wetland that requires a management plan, with the assistance of the Ministry of natural Resources.
- Prepare field maps of the area
- On the site, do a complete inventory of biotic and abiotic features of importance
- Map aquatic vegetation communities by the prescribed methods
- Perform a complete wetland habitat evaluation by an approved methodology
- Assess limitations of the wetland and how these limitations could be overcome by proper management
- Summarize the above information in an appropriate professional report that can be submitted to the Ministry of Natural Resources to further their knowledge about the wetland.
- ***This outcome will constitute approximately 10% of final grade***

III. TOPICS:

1. Wetlands and their roles in Ecosystems
2. Biological components of Wetlands
3. Wetland losses
4. Wetland evaluation
5. Water level control
6. Vegetation management
7. Habitat improvement for game and non-game wildlife

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

1. *Wetland Management course manuals.* There are 3 parts:
 - a. Study Guide
 - b. Readings in wetland management
 - c. Laboratory Manual
2. MacCulloch, R.D., 2002. *The Royal Ontario Museum Field Guide to Amphibians and Reptiles of Ontario.* McClelland and Stewart Ltd. Toronto, Ontario. 168 pp.
3. *Wetland Plants of Ontario*

RESOURCE MATERIALS AVAILABLE IN THE COLLEGE LIBRARY :

1. Bellrose, F.C., 1980. Ducks, Geese and Swans of N.A., 3rd E., Stackpoke, Penn. 540 pp.
2. Bookhout, T.A., E. 1994, Research and Management Techniques for Wildlife and Habitats, Fifth ed., The Wildlife Society, Bethesda, Md., 740 pp.
3. Linde, A.F., 1969. Techniques for Wetland Management. Department of Natural Resources, Madison, Wisconsin. 156 pp.
4. Novak, M., J.A. Baker, M.E. Obbard, B. Malloch ed. 1987, Wild Furbearer Management and Conservation in North America. Ontario Trappers Association, North Bay, Ont. 1150 pp.
5. O.M.N.R. 1987, Community Wildlife Involvement Program Field Manual. Toronto 520 pp.
6. Rue, L.L. III, 1980. Fur-bearing Animals of North America. Crown publ. N.Y. 343 pp.
7. U.S.D.I. 1988-1994. Waterfowl Management Handbook. U.S. Department of the Interior, Washington, D.C. Series of Fish & Wildlife leaflets.
8. U.S. Forest Service, 1969. Wildlife Habitat Improvement Handbook, U.S.D.A. Washington, 200 pp.

V. EVALUATION PROCESS/GRADING SYSTEM:

Evaluation Process:

Reading assignment summaries	- 10%
Technical report	- 12%
Term tests based on theory	- 35%
Wetland evaluation summary/maps	- 15%
Practical tests	- 28%
	<u>100%</u>

Practical test marks will be based on the following:

1. Review quiz of aquatic vegetation
2. Waterfowl I.D.
3. Wetland bird I.D. and calls
4. Reptile and amphibian I.D. and calls
5. Fur-bearers, fur I.D.
6. Marsh monitoring

The following semester grades will be assigned to students in post-secondary courses:

<u>Grade</u>	<u>Definition</u>	<u>Grade Point Equivalent</u>
A+	90 - 100%	4.00
A	80 - 89%	3.75
B	70 - 79%	3.00
C	60 - 69%	2.00
D	50 - 59%	1.00
F (Fail)	49 % or below	0.00
CR (Credit)	Credit for diploma requirements has been awarded.	
S	Satisfactory achievement in field /clinical placement or non-graded subject area	
U	Unsatisfactory achievement in field/clinical placement or non-graded subject area..	
X	A temporary grade. This is used in limited situations with extenuating circumstances giving a student additional time to complete the requirements for a course (see <i>Policies & Procedures Manual - Deferred Grades and Make-up</i>).	
NR	Grade not reported to Registrar's office. This is used to facilitate transcript preparation when, for extenuating circumstances, it has been impossible for the faculty member to report grades.	
W	Student has withdrawn from the course without academic penalty.	

VI. SPECIAL NOTES:

A. Report topics:

Each student will research and write a technical report on a wetland-related topic. Format and technical style will be following the “**Natural resources tech report**” protocol. Suggested length is 6- 8 typed pages. A summary from these reports will form the basis for lecture material in later units of the course. Your report **MUST** reflect your knowledge of wetlands and wetland management and **MAY** include a power-point presentation.

- Conflicts in land use- wetland decline and degradation in Canada -is there a solution?
- Wetland vegetation management by controlled burning
- Wetland vegetation management / pothole creation by explosives
- Use of herbicides/ pesticides in wetlands
- Biological control of wetland vegetation
- Use of fertilizers and liming in wetlands
- Legal aspects of water level manipulation.
- Nuisance waterfowl and their control.
- Cormorants – a boon or blessing?
- Alternatives to lead shot for hunting.
- Fur-bearer requirements to survive and management practices
 - ❖ Beaver / muskrats
 - ❖ Otter, Mink
 - ❖ Terrestrial mustelids
 - ❖ Canidae
 - ❖ Felidae
- Fur harvesting- is it an essential management tool for fur-bearers or is it out-dated, inhumane and unnecessary.
- Requirements for effective waterfowl management
 - ❖ Geese
 - ❖ Puddle ducks
 - ❖ Diving Ducks
- Infectious parasites and diseases of fur-bearers.
- Epidemic diseases or parasites of waterfowl.
- Advantages of water level fluctuation in wetlands/Disadvantages of water level fluctuations in wetlands.
- Exotic plants / animals and their impact on wetlands
- Topic of your choice (pre-approved by instructor)

Special Needs:

If you are a student with special needs (e.g. physical limitations, visual impairments, hearing impairments, or learning disabilities), you are encouraged to discuss required accommodations with your instructor and/or the Special Needs office. Visit Room E1204 or call Extension 2703 that support services can be arranged for you.

Retention of course outlines:

It is the responsibility of the student to retain all course outlines for possible future use in acquiring advanced standing at other post-secondary institutions.

Rights and Responsibilities. Students who engage in “academic dishonesty” will receive an automatic failure for that submission and/or such other penalty, up to and including expulsion from the course/program, as may be decided by the professor/dean. In order to protect students from inadvertent plagiarism, to protect the copyright of the material referenced, and to credit the author of the material, it is the policy of the department to employ a documentation format for referencing source material.

The Professor reserves the right to change the information contained in this course outline depending on the needs of the learner and the availability of resources.

Substitute course information is available in the Registrar's office.

VII. PRIOR LEARNING ASSESSMENT:

Students who wish to apply for advanced credit in the course should consult the instructor. Credit for prior learning will be given upon successful completion.

VIII. DIRECT CREDIT TRANSFERS:

Students who wish to apply for direct credit transfer (advanced standing) should obtain a direct credit transfer form from the Dean's secretary. Students will be required to provide a transcript and course outline related to the course in question.

CICE Modifications:**Preparation and Participation**

1. An Integrative Educational Assistant will attend class with the student(s) to assist with inclusion in the class and to take notes.
2. Students will receive support in and outside of the classroom (i.e. tutoring, assistance with homework and assignments, preparation for exams, tests and quizzes.)
3. Study notes will be geared to test content and style which will match with modified learning outcomes.
4. Although the Integrative Educational Assistant may not attend all classes with the student(s), support will always be available. When the Integrative Educational Assistant does attend classes he/she will remain as inconspicuous as possible.

A. Tests may be modified in the following ways:

1. Tests, which require essay answers, may be modified to short answers.
2. Short answer questions may be changed to multiple choice or the question may be simplified so the answer will reflect a basic understanding.
3. Tests, which use fill in the blank format, may be modified to include a few choices for each question, or a list of choices for all questions. This will allow the student to match or use visual clues.
4. Tests in the T/F or multiple choice format may be modified by rewording or clarifying statements into layman's or simplified terms. Multiple choice questions may have a reduced number of choices.

B. Tests will be written in CICE office with assistance from an Integrative Educational Assistant.***The Integrative Educational Assistant may:***

1. Read the test question to the student.
2. Paraphrase the test question without revealing any key words or definitions.
3. Transcribe the student's verbal answer.
4. Test length may be reduced and time allowed to complete test may be increased.

C. Assignments may be modified in the following ways:

1. Assignments may be modified by reducing the amount of information required while maintaining general concepts.
2. Some assignments may be eliminated depending on the number of assignments required in the particular course.

The Integrative Educational Assistant may:

1. Use a question/answer format instead of essay/research format
2. Propose a reduction in the number of references required for an assignment
3. Assist with groups to ensure that student comprehends his/her role within the group
4. Require an extension on due dates due to the fact that some students may require additional time to process information
5. Formally summarize articles and assigned readings to isolate main points for the student
6. Use questioning techniques and paraphrasing to assist in student comprehension of an assignment

D. Evaluation:

Is reflective of modified learning outcomes.