COURSE OUTLINE: NET0200 - AQUATIC ECOSYSTEM SU

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Course Code: Title	NET0200: AQUATIC ECOSYSTEM SURVEYS
Program Number: Name	1120: COMMUNITY INTEGRATN
Department:	C.I.C.E.
Semesters/Terms:	18F
Course Description:	This is a field course designed to provide students with practical, hands-on instruction to assess the physical, chemical and biological parameters of lake and stream ecosystems. Surveys conducted will follow provincial protocols such as the Ontario Benthos Biomonitoring Network (OBBN) and the Ontario Stream Assessment Protocol (OSAP) to assess ecosystem condition. In addition, students will conduct a creel survey to determine fishing pressure on the St. Marys River during the salmon run. Various Ontario index netting programs will be discussed as methods of providing an unbiased index of abundance as well as collecting biological information on important fish species. A freshwater invertebrate collection of 20 identified specimens is required for submission.
Total Credits:	3
Hours/Week:	3
Total Hours:	45
Prerequisites:	There are no pre-requisites for this course.
Corequisites:	There are no co-requisites for this course.
Substitutes:	NRT246
Essential Employability Skills (EES) addressed in this course:	EES 1 Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience. EES 2 Respond to written, spoken, or visual messages in a manner that ensures effective communication. EES 3 Execute mathematical operations accurately. EES 4 Apply a systematic approach to solve problems. EES 5 Use a variety of thinking skills to anticipate and solve problems. EES 6 Locate, select, organize, and document information using appropriate technology and information systems. EES 7 Analyze, evaluate, and apply relevant information from a variety of sources. EES 8 Show respect for the diverse opinions, values, belief systems, and contributions of others. EES 9 Interact with others in groups or teams that contribute to effective working relationships and the achievement of goals. EES 10 Manage the use of time and other resources to complete projects. EES 11 Take responsibility for ones own actions, decisions, and consequences.
Course Evaluation:	Passing Grade: 50%, D

Other Course Evaluation & Assessment Requirements:

Attendance during field trips is MANDATORY. Students missing field trips without a valid, documented reason will risk repeating the course.
A. First missed field outing will result in a 5% loss to your final grade
B. Second missed field outing will result in a 15% loss to your final grade.
C. Third missed field outing will result in an F Grade for the course.

Course Outcomes and Learning Objectives:

Upon successful completion of this course, the CICE student, with the assistance of a Learning Specialist will acquire varying levels of skill development relevant to the following learning outcomes:

Course Outcome 1	**Learning Objectives for Course Outcome 1**
1. Using computer software, prepare a field map of a lake to be surveyed.	1.1 Using appropriate software, determine the location data for the study lake including local name, topographical map name, district, township, lot & concession, elevation, GPS coordinates, watershed code and access. 1.2 Accurately determine lake perimeter, surface area and percentage of crown vs. patent land. 1.3 Create a 1:10 000 scale lake basin outline on 8.5 x 11 paper including inlets, outlets, trails, roads, power lines, buildings, access point(s), and north arrow to be used in the field.
Course Outcome 2	**Learning Objectives for Course Outcome 2**
2. Conduct a stream survey using standard equipment and methodology.	2.1 Demonstrate in the field the effective and safe use of a backpack electro-fishing unit in sampling fish communities in streams as outlined in the Ontario Stream Assessment Protocol (OSAP). 2.2 Discuss the effect on fish physiology, the mechanics and safety considerations when operating an electro-fisher. 2.3 Properly process and document fish samples. 2.4 Correctly conduct point-transect sampling for channel structure, substrate and bank conditions using the Ontario Stream Assessment Protocol (OSAP) under test conditions. 2.5 Conduct an Ontario Benthos Biomonitoring Network (OBBN) survey including sampling processing and identification of invertebrates to the minimum required taxonomic detail. 2.6 Demonstrate the effective use of the Travelling-Kick-and-Sweep-Transect-Method as a sampling method to collect aquatic invertebrates.
Course Outcome 3	**Learning Objectives for Course Outcome 3**
3. Document, display, analyze and interpret survey field data including lake bathymetry.	3.1 Construct a lake physical features map based on shore cruise data using ArcMap. 3.2 Construct a lake contour map based on lake bathymetry data using Arc/Info. 3.2 Calculate volume, mean depth and shoreline development factor (S.D.F.) for the study lake. 3.4 Correctly complete Ontario Benthos Biomonitoring Network (OBBN) and Ontario Stream Assessment Protocol (OSAP) standardized field forms. 3.5 Compile all lake survey field data including fish vital statistics, water chemistry and shore cruise data into a comprehensive technical report including summary statistics.
Course Outcome 4	**Learning Objectives for Course Outcome 4**

4. Conduct a creel survey and estimate sports fishing pressure and harvest rates by species.	4.1 Explain the objectives of conducting a creel survey and describe the two design types and the calculation differences for each in determining C.P.U.E. and harvest. 4.2 Properly interview anglers, process fish, complete field records and input data as part of a creel survey.
Course Outcome 5	**Learning Objectives for Course Outcome 5**
5. Document, process and correctly identify 20 freshwater invertebrates for presentation.	5.1 Properly collect, preserve and document aquatic invertebrates. 5.2 Use effectively a binocular microscope and reference keys to correctly identify 20 aquatic invertebrates to family. 5.3 Submit an invertebrate collection as outlined with specimen collection records, index and references included.
Course Outcome 6	**Learning Objectives for Course Outcome 6**
6. Describe various methods used in Ontario to assess the status of a fish population.	6.1 Describe common fish tagging and marking techniques and their limitations in estimating species abundance. 6.2 Discuss the indicators of overexploitation. 6.3 Describe Ontario`s provincial index netting standards (such as: Spring Littoral Index Netting, Brook Trout Index Netting, Fall Walleye Index Netting, and Nearshore Community Index Netting) to assess relative abundance.

Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight	Course Outcome Assessed
Exams	40%	All
Field Test & Quiz	10%	1,2
Major Assignments	35%	3,5
Participation/Field Sheets	15%	1,2,5

CICE Modifications:

Preparation and Participation

1. A Learning Specialist 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 Learning Specialist may not attend all classes with the student(s), support will always be available. When the Learning Specialist does attend classes he/she will remain as inconspicuous as possible.

A. Further modifications may be required as needed as the semester progresses based on individual student(s) abilities and must be discussed with and agreed upon by the instructor.

B. 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. **C. Tests will be written in CICE office with assistance from a Learning Specialist.** ***The Learning Specialist 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. **D. 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 Learning Specialist 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 **E. Evaluation:** Is reflective of modified learning outcomes. **NOTE:** Due to the possibility of documented medical issues, CICE students may require alternate methods of evaluation to be able to acquire and demonstrate the modified learning outcomes
Date:	September 18, 2018
	Please refer to the course outline addendum on the Learning Management System for further information.