COURSE OUTLINE: NRT223 - RESOURCE SAMPLING

Prepared: Brian Anstess
Approved: Sherri Smith, Chair, Natural Environment, Business, Design and Culinary

Course Code: Title	NRT223: RESOURCE SAMPLING
Program Number: Name	5214: FISH/WILD CONSERVATN
Department:	NATURAL RESOURCES PRG
Semesters/Terms:	19F
Course Description:	This course is designed to provide the student with the skills and knowledge required to design representative surveys as well as to collect and analyze field data for a variety of resource applications. Statistical analysis, manipulation and presentation of data in professional table and graphic format will be performed using Excel. GPS units, GPS Utilities software and Google Earth Pro will be used to locate and layout sample plots.
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.
Vocational Learning Outcomes (VLO's) addressed in this course: **Please refer to program web page for a complete listing of program outcomes where applicable.**	**5214 - FISH/WILD CONSERVATN** VLO 1 Demonstrate clear, concise and industry appropriate written, spoken and visual communication skills VLO 2 Identify, discuss, organize and assess common flora and fauna species found throughout Ontario, including biological characteristics VLO 3 Demonstrate the ability to follow standardized protocols to collect field data on fish and wildlife populations in a variety of weather and site conditions. VLO 5 Start and manage their careers in the Fish and Wildlife Conservation field. VLO 7 Recognize the contributions and applications of various science disciplines in the understanding of natural environments. VLO 9 Safely operate and maintain equipment used in Fish and Wildlife Conservation. VLO 10 Evaluate and apply current technologies and mathematical concepts used to collect, manage and analyze data. VLO 11 Analyze, evaluate and apply subjective and objective safety considerations.
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 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:	Academic success is directly linked to attendance. Missing more than 1/3 of the course hours in a semester shall result in an `F` Grade for the course.

Course Outcomes and Learning Objectives:

Course Outcome 1	**Learning Objectives for Course Outcome 1**
Design a representative resource survey.	Discuss resource sampling concepts. 1.1 Determine the survey objective. 1.2 Itemize the requirements for a representative resource survey. 1.3 Establish the sampling intensity. 1.4 Outline the sampling method. 1.5 Determine plot size, plot type (variable and fixed area), number of plots, plot location
Course Outcome 2	**Learning Objectives for Course Outcome 2**
Accurately collect resource field data.	2.1 Use maps, GPS units, aerial photographs and/or Google Earth Pro imagery to accurately locate plots in the field. 2.2 Itemize equipment requirements. 2.3 Use equipment check lists. 2.4 Accurately follow instructions for field data collection use the appropriate field equipment in a safe, accurate and precise manner. 2.5 Accurately tally field data. 2.6 Keep neat, accurate and complete field notes and tally sheets.
Course Outcome 3	**Learning Objectives for Course Outcome 3**
Discuss and perform basic statistical analysis on field data.	3.1 Differentiate between descriptive statistics and inferential statistics. 3.2 Use such terms as frequency, sample, population, class limits. 3.3 Review measures of central tendency such as mean, median and mode. 3.4 Review measures of dispersion such as range, standard deviation, and coefficient of variation. 3.5 Calculate the standard error of the mean. 3.6 Determine confidence intervals for the population mean. 3.7 Perform a one and two sample hypothesis testing (t-test). 3.8 Estimate the required sample size for a predetermined precision level. 3.9 Explain linear regression with natural resources examples. 3.10 Define such words as independent variable, dependent variable, linear and non-linear relationship, slope and y-intercept of a straight line. 3.11 Calculate the regression equation between two variables. 3.12 Use correlation analysis and determine the strength of the relationship.

Course Outcome 4	Learning Objectives for Course Outcome 4
Format, present and interpret field data.	4.1 Use properly the Natural Resources Standard Technical Report Format. 4.2 Construct and analyze various graphical representations of data including line and scatter plots, histograms, bar graphs, frequency polygons and circle graphs using appropriate software. 4.3 Construct tables with appropriate labels and titles. 4.4 Import tables and graphs into a technical report. 4.5 Compile data and generate summary statistics. 4.6 Interpret and discuss the results of the surveys.

Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight
Assignments	80%
Tests (2)	20%

Date: June 19, 2019

Addendum: Please refer to the course outline addendum on the Learning Management System for further information.