



COURSE OUTLINE: ESA105 - AUDITING & DATA TOOL

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

Course Code: Title	ESA105: AUDITING, SITE ASSESSMENT AND DATA TOOLS
Program Number: Name	5255: ENV. SUSTAINABILITY
Department:	NATURAL RESOURCES PRG
Academic Year:	2023-2024
Course Description:	Students will learn to use varying data tools in the preparation of technical reports, including documentation of audits and field investigative procedures, data management and interpretation, and development of graphical and tabular presentation of data. Students will learn to create technical reports based on data collected and interpreted from an environmental audit and site assessment. Students will learn to apply environmental legislation, critical thinking and data interpretation in forming conclusions and recommendations for further investigations and/or remediation.
Total Credits:	3
Hours/Week:	3
Total Hours:	42
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:	5255 - ENV. SUSTAINABILITY
Please refer to program web page for a complete listing of program outcomes where applicable.	VLO 1 Develop scientific reports to communicate data, analysis and conclusions to community stake holders.
	VLO 2 Design sampling and analysis of environmental data to implement resource surveys.
	VLO 3 Implement environmental audit standards, including the Environmental Assessment (EA) process to meet legal requirements across municipal, provincial and federal jurisdictions.
	VLO 4 Examine field samples using air, water and soil quality testing equipment to evaluate environmental conditions.
	VLO 5 Apply appropriate air and water pollution testing and abatement processes and technologies according to different segments of industrial and/or residential sectors.
	VLO 6 Interpret the effects of various environmental and climate impacts on plant, animal and human health.
	VLO 7 Develop and implement a model to Build community engagement and capacity to achieve the desired organizational outcomes.
	VLO 8 Apply principles of project management and leadership to complete projects on time and within scope.
	VLO 9 Develop and implement an interdisciplinary perspective to evaluate goals, objectives, and strategies for approaching environmental problems.
	VLO 10 Apply principles and practices of community and industry development to increase



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resiliency, innovation and transformation toward greater sustainability.

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%,

A minimum program GPA of 2.0 or higher where program specific standards exist is required for graduation.

Course Outcomes and Learning Objectives:

Course Outcome 1	Learning Objectives for Course Outcome 1
Students will participate in field and lab based assessments to test various water quality parameters and collection techniques.	<p>1.1 Students will demonstrate how different water parameters impact water quality using environmental regulations.</p> <p>1.2 Students will each sample both groundwater and surface water.</p> <p>1.3 Demonstrate the ability to measure a variety of water quality standards (DO, pH, Turbidity etc.) using multiple lab instruments corresponding with environmental regulations.</p> <p>1.4 Students will be able to provide accurate and detailed labeling and complete chain of custody forms.</p>
Course Outcome 2	Learning Objectives for Course Outcome 2
Demonstrate the ability to use spreadsheet and database programs (Excel, Sheets) for data entry and analysis.	<p>2.1 Demonstrate the ability to utilize spreadsheet softwares (Excel, Sheets) to compile and organize data in a meaningful way.</p> <p>2.2 Demonstrate the ability to use data analysis tools to explore data and perform statistical tests.</p> <p>2.3 Demonstrate the ability to prepare charts and figures using microsoft excel that clearly display important data.</p>



	<p>2.4 Demonstrate the ability to compile and present data and recommendations based on environmental regulations.</p> <p>2.5 Demonstrate the ability to understand the various data collection methods available for sampling forests, soils and waterways. (Quadrats, transects, indirect vs direct sampling)</p>
Course Outcome 3	Learning Objectives for Course Outcome 3
Demonstrate knowledge of elementary statistics and associated terminology.	<p>3.1 Define and distinguish between qualitative and quantitative data.</p> <p>3.2 Describe differences of the four levels of measurement: nominal, ordinal, interval and ratio.</p> <p>3.3 Define and distinguish between discrete and continuous variables.</p> <p>3.4 Understand how to use descriptive statistics to explore data (central tendencies, measures of spread and skewness).</p>
Course Outcome 4	Learning Objectives for Course Outcome 4
Students will participate in field and lab based assessments to test various soil parameters, collection and measurements techniques.	<p>4.1 Demonstrate the ability to take field soil samples using various techniques (auger, cylinder).</p> <p>4.2 Demonstrate the ability to investigate soils pits to determine soil horizons and identify the soil variety.</p> <p>4.3 Demonstrate the ability to perform field tests on soil to determine type and quality (pH, soil texture).</p> <p>4.4 Demonstrate the ability to perform lab tests on soils to further understand soil parameters (bulk density, Water holding capacity, aggregate stability).</p>
Course Outcome 5	Learning Objectives for Course Outcome 5
Students will assess forest health using a variety of in field and lab based tools.	<p>5.1 Demonstrate the ability to accurately take tree measurements (DBH, height, tree cores).</p> <p>5.2 Demonstrate the ability to determine tree ages and assess when stand was planted.</p> <p>5.3 Students will Identify local plants and trees using keys and visual cues.</p> <p>5.4 Demonstrate the ability to differentiate local plants from local invasive species of concern.</p>
Course Outcome 6	Learning Objectives for Course Outcome 6
Students will demonstrate knowledge of Canadian	6.1 Demonstrate an understanding of the canadian environmental assessment act.

	regulatory framework and environmental assessment.	6.2 Demonstrate the ability to utilize Canadian standards to determine healthy soils, water and forests. 6.3 Demonstrate the ability to make recommendations to stakeholders about a forests future use.
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Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight
Data Analysis Assignment	10%
Discussion Board	15%
ESA Report	15%
Lab Notes	15%
Peer Review	5%
Photolog	10%
Presentation	10%
Soil Analysis Assignment	10%
Water Analysis Assignment	10%

Date: August 29, 2023

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