COURSE OUTLINE: NRT261 - FOREST INVENTORY

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Course Code: Title	NRT261: FOREST INVENTORY
Program Number: Name	5230: FORESTRY TECHNICIAN
Department:	NATURAL RESOURCES PRG
Academic Year:	2025-2026
Course Description:	Good forest management depends on reliable and consistent data. This course focuses on collecting and analyzing information needed to describe forest stands. Students will study key forest inventory concepts such as density, stocking, site index, site class, and volume. Sampling strategies, intensities, and the application of formulas to support inventory estimates are explored in-depth. In the field, students will examine growth, productivity and stand dynamics by visiting sites at different stages of development. Students will use GIS software to explore area-based FRI data and LiDAR-based inventory products, focusing on species composition, height, density, and age. Satellite and aerial imagery will be used to identify and compare areas where disturbance and renewal has occurred, with a focus on feature recognition.
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: **Please refer to program web page for a complete listing of program outcomes where applicable.**	**5230 - FORESTRY TECHNICIAN** VLO 1 Conduct forest inventory surveys and field measurements to determine forest resources and values in forests and woodlots. VLO 2 Assess soil characteristics, vegetation and wildlife habitats to identify their interactions within forest ecosystems. VLO 4 Collect, analyze, interpret, and display spatial data using mapping technology and Geographical Information Systems (GIS) to contribute to forest resource management. VLO 7 Select, operate, troubleshoot and maintain tools and equipment in a variety of environmental conditions and in accordance with safety and operating standards. VLO 8 Work independently and in a collaborative environment while applying effective teamwork, leadership and interpersonal skills. VLO 9 Communicate technical information to a variety of stakeholders in oral, written, visual and electronic forms. VLO 10 Develop strategies for ongoing professional development to enhance work performance in the forestry sector.
Essential Employability	EES 1 Communicate clearly, concisely and correctly in the written, spoken, and visual form

Skills (EES) addressed in this course:		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 A minimum program GPA of 2.0 or higher where program specific standards exist is required for graduation.
Other Course Evaluation & Assessment Requirements:	Academic success is related to complete and consistent attendance. Absenteeism involving greater than 15 course hours shall result in an automatic F grade as per School of Natural Environment policy. Sault College policy on academic integrity associated misconduct is strictly followed in this course. Incidents will be reported, recorded, tracked over time, and sanctioned on a per student basis.
Books and Required Resources:	TM-10, Vegetation Sampling Network Protocol: Tech Specs, Science and Research Branch, MNRF 2023 Ecosite Land Classification Guide, OMNR 2009 Field Guide to the substrates of Ontario, OMNR 2011 Forest Information Manual, MNRF 2020
Course Outcomes and Learning Objectives:	(table below)

Course Outcome 1	Learning Objectives for Course Outcome 1
1. Apply consistent and accurate mensuration techniques while adhering to standardized forest inventory plot protocols in support of forest management.	1.1 Satisfy minimum error standards for tree diameter, height, and age. 1.2 Calculate stem and stand density using field measurements. 1.3 Consistently establish the location and boundaries for fixed area plots. 1.4 Assess stand level forest information using data from multiple plots. 1.5 Compute species composition, basal area, and volume per

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Course Outcome 2	Learning Objectives for Course Outcome 2
2. Plan and complete a timber cruise inventory for predetermined forested stands.	2.1 Work as a group to sample a forested stand with a 5% intensity. 2.2 Plan plot access and layout using GIS software and GPS. 2.3 Publish a stand inventory map including stand and stock tables. 2.4 Maintain accurate hardcopy and digital records of field data. 2.5 Communicate effectively and cooperate responsibly in forested environments.
Course Outcome 3	**Learning Objectives for Course Outcome 3**
3. Establish and complete a fixed area vegetation sampling network protocol using standardized procedures and reference materials.	3.1 Gain an understanding of vegetation sampling network protocols for calibrating LiDAR data. 3.2 Maintain positional and directional accuracy while collecting data. 3.3 Record FRI data in field using devices and hardcopy forms. 3.4 Identify trees and shrubs using the FOIBIS coding system. 3.5 Perform individual stem mapping and crown delineations. 3.6 Identify species of concern, invasive, and/or wetland indicator plants. 3.7 Enter and check for data errors and quality.
Course Outcome 4	**Learning Objectives for Course Outcome 4**
4. Update GIS for an existing area-based forest inventory by applying new field data, silvicultural records, and disturbance information.	4.1 Understand the legislated requirements. 4.2 Understand how FRI attributes govern forest management planning. 4.3 Query FRI records and recognize landscape and ecosystem trends. 4.4 Combine satellite imagery with disturbance and renewal records. 4.5 Symbolize and label FRI polygons for map publishing purposes.
Course Outcome 5	**Learning Objectives for Course Outcome 5**
5. Successfully perform feature and species recognition on imagery using interpretation techniques and strategies.	5.1 Become familiar with `non-forested` ecosites using optical imagery. 5.2 Identify conifer and hardwood tree species on various forms of imagery. 5.3 Recognize differences in landscape and drainage patterns. 5.4 Describe landscape features using the geological terrain survey coding structure. 5.5 Describe the patterns associated with different forestry silvicultural methods.

Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight
Assignments	40%
Field Activities	30%
Tests/quizzes	30%

| **Date:** | December 2, 2025 |
| **Addendum:** | Please refer to the course outline addendum on the Learning Management System for further information. |