COURSE OUTLINE: NRT239 - SILVICULTURE II

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Course Code: Title	NRT239: SILVICULTURE II
Program Number: Name	5230: FORESTRY TECHNICIAN
Department:	NATURAL RESOURCES PRG
Academic Year:	2023-2024
Course Description:	A continuation of Silviculture 1 with emphasis on silvicultural assessments typically carried out by forest technicians. Reforestation audits, regeneration surveys, preharvest stand analysis and others will be carried out. The use of GPS, and other technological systems will assist in understanding how planning and monitoring silvicultural effectiveness on crown and private land are carried out.
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.
Substitutes:	NRT202
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 3 Perform technical functions in silvicultural operations and assist in the monitoring and evaluation of the effectiveness of silvicultural practices. VLO 4 Collect, analyze, interpret, and display spatial data using mapping technology and Geographical Information Systems (GIS) to contribute to forest resource management. VLO 5 Contribute to sustainable forest management plans, including conservation and rehabilitation measures, taking into consideration the perspectives of a variety of stakeholders and the requirements of relevant legislation and regulations. VLO 6 Identify and analyze forest diseases, pests, invasive species and other disturbance events and implement mitigation strategies to maintain and improve forest ecosystems. 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.

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 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 directly linked to attendance. Missing more than 1/3 of the course hours in a semester shall result in a F Grade for this Course.

Course Outcomes and Learning Objectives:

Course Outcome 1	Learning Objectives for Course Outcome 1
Demonstrate an understanding of forest renewal in Ontario.	1.1 Outline legislation. 1.2 Describe responsibilities for Silviculture Effectiveness Monitoring in forest management and outline the process involved in its implementation. 1.3 Understand the components of silvicultural contracts and their development. 1.4 Be able to abide and surpass Ontario safety regulations in every forest scenario or work. 1.5 Understand the limitations and successes of silviculture practices on private land.
Course Outcome 2	**Learning Objectives for Course Outcome 2**
Demonstrate the ability to conduct and administrate an operational tree plant.	2.1 Select planting stock to meet specific forest regeneration objectives. 2.2 Develop contracts for the production and planting of nursery stock. 2.3 Integrate tree planting with other forest management activities. 2.4 Demonstrate the proper care and handling of planting stock. 2.5 Demonstrate the proper use and care of tree planting equipment. 2.6 List and identify operational tree plant strategies including microsite selection, spacing, planting technique, selection of tools and planting faults.

	2.7 Describe a minimum of 2 planting assessment procedures.
Course Outcome 3	**Learning Objectives for Course Outcome 3**
Plan and conduct pre-commercial tending operations.	3.1 Plan brushing, pre-commercial thinning and spacing operations. 3.2 Calculate optimal spacing ratios for crop tree release operations in hardwoods. 3.3 List factors to consider when determining the feasibility of conducting pruning, thinning operations 3.4 List and describe how spacing can affect forest tree growth.
Course Outcome 4	**Learning Objectives for Course Outcome 4**
Understand why vegetation control is necessary for long-term successful management.	4.1 Identify and list vegetation competitor species. 4.2 Demonstrate knowledge of silvics of competitor species. 4.3 Describe pesticide application techniques and equipment. 4.4 Demonstrate a complete understanding of pesticide environmental and human health hazards. 4.5 List and compare non-chemical to chemical methods of pest management used in forestry. 4.6 List major invasive species and control methods in S. Ontario woodlots.
Course Outcome 5	**Learning Objectives for Course Outcome 5**
Determine how successfully an area is regenerating to suitable tree species (Silviculture Effectiveness Monitoring).	5.1 Understand why we carry out regeneration and free to grow surveys and their methodology. 5.2 Describe the features of a regeneration survey and a free to grow survey. 5.3 Carry out and compile a regeneration survey using well spaced free growing regeneration assessment procedures.
Course Outcome 6	**Learning Objectives for Course Outcome 6**
List and define selected principals and practices used in tree improvement.	6.1 Identify tree seed zones and the effects of provenance. 6.2 Identify plus tree characteristics. 6.3 List and describe the reasons for setting up a seed orchard. 6.4 Briefly describe the theoretical basis for tree improvement. 6.5 List the characteristics of clonal and seedling seed orchards. 6.6 Define the purpose for and the design of a family test plot.
Course Outcome 7	**Learning Objectives for Course Outcome 7**
Be able to predict proper timing for commercial thinning, group selection and shelter wood applications	7.1 Develop an understanding for Stand Density Index. 7.2 Write crop plans for specific stands and determine timing and volume estimates for thinning. 7.3 Be able to inventory and predict future thinning in Jack and Red Pine stands. 7.4 Understand prescriptions for and be able to identify and apply group selection for mid-tolerant tree species.

Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight
Assignments	50%
Field Trip/Participation	15%

	Tests/Quizzes	35%
Date:	July 20, 2023	
Addendum:	Please refer to the course outline addendum on the Learning Management System for further information.	