

Forestry 1001
Introduction to Forest Mensuration
2012 Abilities

A - BASIC FOREST MEASUREMENTS

Subject	Skill ID	Description
Individual Tree Measurements		
<i>Species</i>	ITM-S1	Develop/use a dichotomous key to differentiate an assigned list of species based on leaf and twig characteristics (summer key only)
	ITM-S2	Identify a species using the whole tree or twig samples
	ITM-S3	Use scientific names in the field and in reports
<i>DBH</i>	ITM-D1	Measure dbh using a diameter tape and calipers
<i>Height</i>	ITM-H1	Measure height using a Suunto clinometer
	ITM-H2	Measure height to crown base using a Suunto
<i>Age</i>	ITM-A1	Determine the age of a tree using increment cores or disks (tree cookies)
<i>Condition</i>	ITM-C1	Assign a canopy class to trees based on crown characteristics
	ITM-C2	Assess visual tree quality using a simple visual quality index
	ITM-C3	Classify dead trees according to snag condition or coarse woody debris condition
<i>Basal Area</i>	ITM-X1	Calculate the cross-sectional area of an individual tree
<i>Volume</i>	ITM-V1	Calculate the volume of an individual tree using a volume table and volume equation
<i>Biomass & Carbon</i>	ITM-B1	Use equations and tree measurements to estimate biomass and carbon content in trees and stands
Plot Measurements		
<i>Fixed Area Plots</i>	PLM-F1	Collect data for estimating stand parameters using fixed area plots
<i>PPS Points</i>	PLM-P1	Collect data for estimating stand parameters using PPS points
<i>Line Transects</i>	PLM-L1	Collect data for estimating stand parameters for down woody debris using line transects

Subject	Skill ID	Description
Stand and Forest Maps		
<i>Woods Navigation</i>	SFM-W1	Measure distances using pacing in the woods
	SFM-W2	Follow a compass bearing in the woods
	SFM-W3	Mark a location using a GPS
	SFM-W4	Use a GPS to find a location in a stand
<i>Mapping</i>	SFM-M1	Determine map scale from field measurements, or measurements between two different maps or photos
	SFM-M2	Determine land area using maps and a dot grid or line transect method
	SFM-M3	Be able to locate North on a map or photo from field measurements
	SFM-M4	Be able to determine azimuth and distance between two points on a map or photo
Ground Vegetation		
<i>Identification</i>	GVO-I1	Identify a small set of commonly occurring ground species
	GVO-I2	Identify browsing of ground species by key herbivores
Water		
<i>Measurement</i>	WAT-M1	Obtain measurements of a water body to quantify its condition for a specified water characteristic (e.g. flow, turbidity, etc.)
	WAT-M2	Draw a conclusion about site-specific impact by comparing water measurements at two locations on a water body.

B - STAND STRUCTURE DESCRIPTION

Subject	Skill ID	Description
Estimation of Stand Parameters		
<i>Species Composition</i>	ESP-C1	Estimate species composition on the basis of stand density, basal area, or volume
	ESP-C2	Construct histograms to show species composition
<i>Mean Tree Characteristics</i>	ESP-T1	Estimate arithmetic mean tree diameter from a given set of tree measurements
	ESP-T2	Estimate quadratic mean tree diameter from a given set of stand parameters
	ESP-T3	Estimate arithmetic mean tree height from a given set of tree measurements
	ESP-T4	Estimate Lorey's mean tree height from a given set of tree measurements
	ESP-T5	Estimate mean tree volume from a given set of tree measurements or stand parameters
<i>Stand Characteristics</i>	ESP-S1	Construct stand and stock tables from fixed area plot tally
	ESP-S2	Construct stand and stock tables from angle count sampling tally
	ESP-S3	Apply appropriate conversion factors to change values based on unit of measure
	ESP-S4	Use product ratios to determine product content in a tree or stand
	ESP-S5	Estimate stumpage value given a set of product specifications, costing information, and stand table data
	ESP-S6	Demonstrate how to calculate Tree Factor and use it to estimate average density for a given set of measurements
	ESP-S7	Demonstrate how to calculate Basal Area Factor and use it to estimate average basal area/unit area for a given set of measurements
	ESP-S8	Demonstrate how to calculate Volume Factor and use it to estimate average volume/unit area for a given set of measurements
	ESP-S9	Demonstrate how to calculate stand parameters for down woody debris using line transect data

C - STATISTICAL AND AND DATA ANALYSIS SKILLS

Subject	Skill ID	Description
Basic Statistical Concepts		
<i>Data</i>	BSC-D1	Differentiate between categorical, ordinal and nominal data types
<i>Parameters</i>	BSC-P1	Estimate appropriate sample parameters from sample data
	BSC-P2	Differentiate between bias, measurement error (mistakes) and sample error
	BSC-P3	Calculate an appropriate confidence interval for a sample parameter
Sample Design and Analysis		
<i>Single Stand Sampling</i>	SDA-S1	Implement a prescribed sampling scheme for a single forest stand to achieve a stated sampling objective
	SDA-S2	Design a random or systematic sampling scheme for a single forest stand to achieve a stated sampling objective
	SDA-S3	Calculate the minimum number of samples required to achieve a desired level of statistical precision
	SDA-S4	Calculate appropriate stand totals for a given set of sample data
Spreadsheet Skills		
<i>Data Organization</i>	SSS-D1	Use a spreadsheet to develop a field data form
	SSS-D2	Enter field data into a spreadsheet so that the data can be easily analyzed
<i>Data Manipulation</i>	SSS-M1	Use a spreadsheet to generate a list of random numbers
	SSS-M2	Use spreadsheet formulae to conduct basic data calculations and conversions
<i>Data Summary and Display</i>	SSS-S1	Use spreadsheet functions to calculate basic statistical analyses (mean, standard deviation, etc.)
	SSS-S2	Use spreadsheet functions to lookup appropriate values of Student's t-distribution and calculate confidence intervals
	SSS-S3	Use spreadsheet graphics to develop appropriate histograms and graphs of data

D - PROBLEM SOLVING

Subject	Skill ID	Description
Problem Definition	PRS-D1	Identify the problem from a problem statement
	PRS-D2	Identify key parameters in a problem statement
	PRS-D3	Identify and define all deliverables in a problem statement
Solution Strategy	PRS-S1	Clearly explain the process or methods used in each step of a problem solution (tactics)
	PRS-S2	Define or explain the methods to calculate key parameters
	PRS-S3	Implement a solution strategy
Problem Solution and Results	PRS-R1	Summarize data into meaningful tables that are appropriately titled and labeled and cited within the text of a report
	PRS-R2	Summarize data into meaningful histograms or graphs that are appropriately titled and labeled and cited within the text of a report
	PRS-R3	Provide necessary maps that are appropriately titled and labeled and cited within the text of a report
	PRS-R4	Summarize and describe main results
Problem Evaluation	PRS-E1	Use a confidence interval to comment on the quality of solution results
	PRS-E2	Identify strengths and weaknesses associated with solution results
	PRS-E3	Identify methods to improve the solution