SFR 205: Forest Measurements and Statistics
Syllabus Spring 2013

Course Description:
Encompasses methods used to measure log, tree, stand, and forest-level attributes. Principles of summarizing individual tree data and of using statistics in forest management are presented. Lec 2, Lab 3.

Satisfies General Education Requirement for Quantitative Literacy.

Prerequisites: SFR 107 and MAT 111, or permission

Credits: 3.

Time and Place:
Lecture: 9:30 to 10:45 AM, Tues. & Thurs.; Nutting Hall 102
Lab: 1:10 to 5:00 PM, Thurs.; Nutting Hall 239

Instructors:
Alan J. Kimball, M.S., L.P.F
Nutting Hall 250
Office hours: By appointment
akimball@maine.edu
581-2849

Aaron Weiskittel
Nutting Hall 229
Office hours: 2:30 -3:30 PM, Mon & Wed
aaron.weiskittel@maine.edu
581.2857

Textbooks:

Equipment:
Compass, diameter tape, hard hat, statistical calculator, cruising vest

Course Structure and Organization:
To manage forest resources sustainably, practitioners must know the quality and quantity of resources and how they change over time. Forest measurements provides information that support forest management decisions at the stand and forest levels. Although the general topic of the course focuses on quantitative and statistical analysis of forest vegetation, we will spend considerable time and effort on understanding other forest resources (e.g., wildlife habitat resources and riparian zones). Moreover, the theory and methodology discussed in this course can be applied to other renewable resources.

The instructors assume that you have successfully completed the prerequisite courses listed above. If you have not completed these courses, please notify the course instructor at the beginning of the term.
SFR 205 is a lecture-lab course with two 50-minute lectures and one 3-hour lab per week.

The course will have both theoretical and practical components, with major emphasis on measurement and summarization of individual tree data. Topics are presented both in class and lab sessions. The lab section
focuses on learning how to use Microsoft Excel as well as various statistical methods used to obtain and analyze tree, stand and forest-level data.

**Course Objectives**

The overall objective of this course is to understand the principles, concepts, and methods used for log, tree, stand, and forest-level measurements that support management decisions. Also, students will learn practical skills for both office and field settings.

**D. Course Outcomes**

After completing the course, a student will be able to:
1. develop skills necessary to measure, acquire, analyze, and describe mensurational data and interpret resulting information;
2. explain mathematical, statistical, and mensurational principles for designing and applying measurement and sampling protocols;
3. correctly use instruments and techniques for log, tree, stand, and forest level measurements;
4. demonstrate conventional timber cruising and log scaling skills, as well as other techniques for measuring attributes needed for ecosystem management.
5. use Microsoft Excel to display, analyze, and summarize data

**Grading Policy**

Grading will be based on thirteen weekly laboratory assignments, field performance, one-midterm exam, one field exam and a final exam. All laboratory assignments will have the same weight and will be graded on a percentile basis. The relative weights of the course components are:

- Lab reports (13) and field performance 40%
- Midterm Exam 15%
- Field Exams (2) 20%
- Final Exam 20%
- Participation 5%

Grades will be assigned as follows:

- 90 – 100 A
- 80 - 89 B
- 70 - 79 C
- 60 - 69 D
- Below 60 E

Late assignments will lose 10% each day past the due date unless the Instructor or Graduate Teaching Assistant is notified prior. Students will only be excused from an exam in only two situations: (1) preapproved absence for medical reasons and (2) emergency medical absence.

**Course Topics and Schedule**

<table>
<thead>
<tr>
<th>Week</th>
<th>Lectures</th>
<th>Lab</th>
<th>Readings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Course Introduction</td>
<td>Introduction to using Microsoft Excel (Nutting 239)</td>
<td>Husch; p. 1 - 4</td>
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<tr>
<td></td>
<td>Why forest measurements are important?</td>
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<tr>
<td>2</td>
<td><strong>Martin Luther King Day (no class)</strong></td>
<td>Dealing with data in Microsoft Excel (Nutting 239)</td>
<td>Husch; p. 5-20</td>
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<tr>
<td></td>
<td>Principles of Measurements</td>
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<th>Week</th>
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<tbody>
<tr>
<td>3</td>
<td>What are statistics and why are they important? Descriptive vs. Inferential Statistics</td>
<td>Statistics in Microsoft Excel (Nutting 239)</td>
<td>Husch; p.28-45, 49-53</td>
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<tr>
<td>4</td>
<td>Land Area and Navigation Use of GPS and GIS in forestry</td>
<td>Use of GPS in forestry (Field/Nutting 239)</td>
<td>Husch; p. 53-80</td>
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<tr>
<td>5</td>
<td>Basic Tree-Level Measurements (Age &amp; DBH) Basic Tree-Level Calculations (Basal area, volume, and biomass)</td>
<td>Measuring DBH (Field/Nutting 239)</td>
<td>Husch; p81-99</td>
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<tr>
<td>6</td>
<td>Basic Tree-Level Calculations (HT, crown length, crown ratio)</td>
<td>Measuring HT (Field/Nutting 239)</td>
<td>Husch; p99-117</td>
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<td>7</td>
<td>Review Exam</td>
<td>Lab Exam</td>
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<td>8</td>
<td>Introduction to Regression Use of regression in forestry</td>
<td>Regression (Nutting 239)</td>
<td>Husch; p. 48-49, 142-144, 157-161, 177-178</td>
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<tr>
<td>9</td>
<td>Measurement units used in forestry Stand-level attributes (basal area, quadratic mean diameter and stem density)</td>
<td>Measurement units and stand-level attributes (Nutting 239)</td>
<td>Husch; p. 162-174, 201-203</td>
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<tr>
<td>10</td>
<td>Introduction to sampling Sample size calculation</td>
<td>Sampling (Nutting 239)</td>
<td>Husch; p.261-265</td>
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<td>11</td>
<td>Sampling the forest Fixed radius sampling</td>
<td>Fixed Radius Plot Sampling</td>
<td>Husch; p.261-265</td>
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<tr>
<td>12</td>
<td>Variable radius sampling Variable radius sampling (continued)</td>
<td>Variable radius plot</td>
<td>Husch; p. 272-282</td>
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<tr>
<td>13</td>
<td>Forest Inventory Forest Inventory in the real world</td>
<td>Planning a forest inventory (Field/Nutting 239)</td>
<td>Husch; p. 290-305</td>
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<tr>
<td>14</td>
<td>Review Maine Day</td>
<td>Lab Exam</td>
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Lab reports and field performance:
Lab reports are due 1 week after they are assigned. Late lab reports will not be accepted.

For field labs, the relevant maps and descriptions of the labs will be handed out prior to each lab session. Field procedures will be explained at the start of each lab session. Laboratory exercises will be conducted in crews of three or four students each. For each lab, crews will work independently, applying the knowledge acquired in lectures and labs.

Exams:
One midterm exam and one final exam (finals week) will be given during the semester. The exams will be open book and will involve an array of formats including multiple choice, short answer, and essay. The questions will come from lectures, the textbook, and labs. In addition, there will be 2 exams given during lab and will test field skills.

Participation:
Class participation will include attendance and active engagement during the course. Participation will be assessed primarily with in-class writing exercises.

Availability of Course Material:
All course materials will be made available on Blackboard (https://www.courses.maine.edu). You will be required to enter your University of Maine System user name and password to gain access to the site.

Attendance Policy:
Attendance is expected at all lectures and required at all laboratories. Students missing laboratories for a good reason should notify the instructor or Graduate Teaching Assistant prior to lab to arrange an alternate assignment. Failure to do so will result in a zero for that exercise. Three missed labs will result in an L grade for the course (a failure for nonattendance).

Accommodations for Students with Disabilities:
Students with disabilities statement: If you have a disability for which you may be requesting an accommodation, please contact Ann Smith, Director of Disabilities Services, 121 East Annex, 581-2319, as early as possible in the term.

Academic Integrity:
Academic dishonesty includes cheating, plagiarism and all forms of misrepresentation in academic work, and is unacceptable at The University of Maine. As stated in the University of Maine’s online undergraduate “Student Handbook,” plagiarism (the submission of another’s work without appropriate attribution) and cheating are violations of The University of Maine Student Conduct Code. An instructor who has probable cause or reason to believe a student has cheated may act upon such evidence, and should report the case to the supervising faculty member or the Department Chair for appropriate action.

School of Forest Resource students must adhere to the University of Maine Student Conduct Code. Each student is expected to work independently on all exams, including take home exams. Students may neither give nor receive any assistance on examinations. All written material, including homework, term papers, reports, etc., must be the student’s original work. The bounds of original work and the degree of collaboration that will be allowed in this course will be established by the professor. The work(s) of others may only be used with proper reference or acknowledgment. Failure to adhere to this policy can result in the receipt of a failing grade, suspension, or dismissal from the University. Official University Policy: No tuition refunds will be allowed for dropped courses after the second week of class unless very extraordinarily extenuating circumstances exist.

Course Disruption:
In the event of an extended disruption of normal classroom activities, the format for this course may be
modified to enable its completion within its programmed time frame. In that event, you will be provided an addendum to the syllabus that will supersede this version.

Course Map

- SFR 107: Forest Vegetation
- SFR 200: Summer Camp I
- SFR 105: Forest Measurements & Statistics
- SFR 300: Summer Camp II
- SFR 402: Advanced Measurements
- SFR 407: Forest Ecology
- SFR 408/409: Silviculture
- SFR 477: Forest Landscape Management & Planning
- SFR 489: Capstone Project