

Instructor: Robert Froese, PhD, RPF

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Teaching Assistants: Chris Miller (camiller@mtu.edu) and Mickey Jarvi (mpjarvi@mtu.edu).

Office Hours: I have no designated office hours because I'm usually in my office. I have an open-door policy, which means that if my door is open, come in; please be encouraged to make appointments if you prefer. I check my email usually no less than once per hour and I'm almost always available by instant message, often in the evenings too.

Pre-requisites: MA2720 or equivalent.

Course Goals and Objectives: You're training to become natural resources scientists, experts and managers. Considering the natural resources or values of interest to you, your client, or your employer, then:

Inventory: How much is present, or available? In what condition is it? Where is it? How confident are we in our estimates?

Monitoring: How is an inventory changing? Has a critical change occurred?

Data analysis: From measurements, how do we characterize our inventory? How do we use our data to draw conclusions and gain understanding? Our data are expensive and valuable; how do we extract maximum value from them?

In FW2051 you measured individual organisms or things. For example, you learned how to measure the height or diameter at breast height of individual trees. In this class, we make the transition from measuring attributes of individuals to characterization of communities and populations. For example, we'll use samples of trees to characterize populations (e.g., average dbh) and combine data to estimate derived attributes (e.g., volume per acre).

My goal is that everything you do here be useful in your future endeavours. That means, this class will help you get a better grade and deeper understanding at Camp and in Capstone. You need to develop competence in collecting and processing data to excel as natural resource professionals. In your careers, there won't be a TA available to tell you which statistical test to use or to show you how to generate data summaries in a software package. You'll need enough knowledge to do this yourself. So this course is about preparing you for the future: giving you the skills and understanding to make your future work easier and more meaningful.

We'll start with a review of basic statistics. Then we'll cover computing skills, and for the next four weeks we'll cover using statistics for data analysis. Next, we cover sampling designs, vegetation inventory, and inventory methods for other resource values, like wildlife or recreation. We'll conclude with monitoring programs and change detection.

About the course: Note first the course website; everything we do will be documented and coordinated there: <http://www.biometrics.mtu.edu/fw3200>. We meet M/W/F at 12:05-12:55 in room G002. The main SFRES computer lab is reserved for your use during each lab session, which run Tuesdays and Wednesdays at 14:05-16:55. Your TA will be there to support you, not to lead you. *You may complete the homework when and where you prefer; you do not have to attend the lab session!*

There are no “formal” exams in this class. Your grade will be made up of 13 homework assignments, equally weighted, comprising 40% of your course grade, and six quizzes, equally weighted, comprising 60% of your course grade. Note that the grading system may be more spread out than the one you're used to: >95%=A, 88-94%=AB, 81-87%=B, 72-80%=BC, 65-71%=C, 58-64%=CD, 50-57%=D and < 50%=F. So a “C” grade requires a numeric grade of 65% not 73%, but this doesn't mean it's any easier to get a C in this class than in any other.

Textbooks: There is ONE required text for the course:

Avery, T.E. and H.E. Burkhart. 2002. Forest Measurements (5th ed). McGrawHill, Madison WI. 456 pp.

Assigned readings will be posted on the class website. I recommend you keep whatever textbook you bought for your statistics class handy, as you'll need to refer to it periodically.

Basic rules for the class: I have a simple rule set. Everything is optional, including attendance, assignments and quizzes. You're adults, you're paying good money to be here, so I expect you're motivated to make good use of the time and resources that you've purchased. You have many demands on your time, and you're the best person to judge how to spend it. At the same time, everything is fair game, in assignments, exams and even in meetings with me. Something from every lecture and every assignment will be graded or quizzed during the course and contribute to your final grade. So while everything is optional I strongly advise you to come to every lab and class.

Assignments will be submitted in *professional memo format*; this means neat, organized, legible, using good grammar and appropriate formatting. *Late assignments will not be accepted*, other than cases of documented medical excuses or family emergencies. Because failure is a matter of when, not if, developing computer use habits that minimize the impact of failure is a necessary and basic expectation of everyone. I expect that you know to save your work frequently, after every major change, and to back up your work regularly. You can expect the same from me. As a consequence and *in any case* computer failure will not be accepted as an excuse for turning in assignments late.

Permissible Collaboration: You are graded in this class in two ways: through quizzes and through homework.

Quizzes are “closed book”, completed individually, and the only aids you are permitted are a calculator and any commercially available “reference guides” (e.g., www.barcharts.com). No sharing of information is permitted during a quiz, deliberate or incidental.

Homework assignments are to be completed individually, but you are allowed to discuss the work with your classmates and with your TA. Your submission must be created individually and must represent your personal, individual response to the assigned tasks. In other words, you may collaborate with your classmates to discover *how* to do an assignment, but when you actually *do* an assignment and write your submission you must do that by yourself.

University Policies: I am required per Senate Proposal 26-08 to include the following statements regarding University Policy and Procedures.

Academic regulations and procedures are governed by University policy. Academic dishonesty cases will be handled in accordance the University's policies.

If you have a disability that could affect your performance in this class or that requires an accommodation under the Americans with Disabilities Act, please see me as soon as possible so that we can make appropriate arrangements. The Affirmative Action Office has asked that you be made aware of the following:

Michigan Tech complies with all federal and state laws and regulations regarding discrimination, including the Americans with Disabilities Act of 1990. If you have a disability and need a reasonable accommodation for equal access to education or services at Michigan Tech, please call the Dean of Students Office, at 487-2212. For other concerns about discrimination, you may contact your advisor, department head or the Affirmative Action Office, at 487-3310.

Academic Integrity:

http://www.studentaffairs.mtu.edu/dean/judicial/policies/academic_integrity.html

Affirmative Action:

<http://www.admin.mtu.edu/aao/>

Disability Services:

http://www.admin.mtu.edu/urel/studenthandbook/student_services.html#disability

Equal Opportunity Statement:

<http://www.admin.mtu.edu/admin/boc/policy/ch3/ch3p7.htm>

Good Luck!

Remember: if you don't tell me when you're having a problem, I can't help solve it. So **come see me** if you need anything to help you succeed.

Course Outline: The course runs for fourteen weeks, starting January 12, 2008. Labs will be assigned at the beginning of each week and due in class on Monday of the following week. In other words, the first lab is assigned on 01/12/09 and due 01/19/09.

Please note: you may complete the assignments when and where you prefer; you do not have to attend the lab session!

Since this is the first offering of this class, the schedule is tentative and subject to revision. I envision at least one field exercise late in the semester. If there's snow on the ground in early April, then we'll be slogging through snow. *C'est la vie!*

Starting	Lecture topic	Assignment topic
01/12/09	Introduction and review of basic stats	Basic Stats
01/19/09	Computing and spreadsheets	CLT by simulation
01/26/09	Computing and databases	Data Analysis
02/02/09	Tests to look at differences	Looking at differences
02/09/09	Tests to look at relationships: part 1	Multiple differences
02/16/09	Tests to look at relationships: part 2	Correlation and Regression
02/23/09	Tests for data exploration	Multiple Regression
03/02/09	Simple Random Sampling	Simple Random Sampling
03/16/09	Stratified Sampling	Stratified Sampling
03/23/09	Advanced Sampling	Advanced Sampling
03/30/09	Volume, Biomass and Carbon	Volume and Biomass
04/06/09	Vegetation Inventory	Field Exercise
04/13/09	Non-timber inventory	Field Exercise
04/20/09	Monitoring and change detection	no lab this week