Instructor: Robert Froese, PhD, RPF

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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: Graduate standing.

Course Goals and Objectives: Regression analysis is a widely used suite of analytical techniques particularly suited to natural resources data. One of the strengths of regression is the conceptual simplicity of using an equation to represent a relationship between predictor variables and their associated response. This is also a weakness: drum into your mind the phrase “correlation does not imply causation” and you'll overcome (part of) this weakness.

The goal in this course is to give you some experience with basic regression techniques that you can apply in your research, expose you to situations where regression analysis is useful (and perhaps not useful), and most of all give you enough understanding that you can evaluate regression in papers your read. The course is entitled “applied regression” because the focus is not on underlying theory; however, you need to know enough about how regression works to be able to evaluate a regression solution in a particular research situation.

About the class: Note first and foremost the class website; everything we do will be documented and coordinated there: http://www.biometrics.mtu.edu/fw5411. We meet M/W/F at 11:05-11:55 in room O143. There’s no “lab” session for this class.

Your course grade has four parts: homework (40%), a midterm exam (20%), a final exam (20%) and a project (20%). My grading system is as follows: >95%=A, 89-94.9%=AB, 83-88.9%=B, 77-82.9%=BC, 71-76.9%=C, 65-70.9%=CD, 60-64.9%=D and < 60%=F.

Please note that there is a companion class to this one, called FW5412 – Regression in the R Environment for Statistical Computing. You will need to use statistical software (other than Excel) to complete the homework in this class. A good choice is R, which is powerful, open-source, cross-platform and best of all completely free. If you sign up for FW5412 and do the assignments in R you can get extra credit. That is all FW5412 is about. For more info go here:

http://www.biometrics.mtu.edu/CRAN/
Textbooks: There is a required text for the course:


Between me and you: Graduate classes are different from undergraduate classes. I'm assuming you're taking this class because you want or need to add regression to your tool set. In any case, I expect you are mature, motivated, intelligent adults. In this class, everything is optional, including attending class, completing assignments and submitting projects. You have many demands on your time, and you're the best person to judge how to spend your time. At the same time, I will hold all of you objectively and equally to the same high standard. I suggest you keep up with the lectures, and let me know if you fall behind.

You can expect from me that I will set reasonable goals, explain them to you, and treat you with respect. I'll evaluate you fairly, and explain the evaluation. I'll also help you in and outside of class as much as can possibly accommodate. You can send me email and expect some kind of reply within 24 hours.

Assignments will be submitted electronically whenever practicable and will be professionally prepared; 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 computer failure is a matter of when, not if, developing 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.

Course Outline: The course runs for fourteen weeks, starting 09 January 2012. We will follow Montgomery et al., with minor deviations:

1. Review of Basic Statistics
2. Scatterplots and Regression
3. Simple Linear Regression
4. Multiple Regression
5. Drawing Conclusions (in Regression Analysis)
6. Weights, Lack of Fit, and More
7. Polynomials and Factors
8. Transformations
9. Regression Diagnostics: Residuals
10. Outliers and Influence
11. Variable Selection
12. Nonlinear Regression
13. Logistic Regression
14. Mixed Models
**Permissible Collaboration:** You are graded in this class in three ways: through a project, two exams and through homework.

Exams 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 an exam, deliberate or incidental.

Homework assignments and your project are to be completed individually, but you are allowed to discuss the work with your classmates and with me. I encourage you to discuss the problems as I believe this enhances your understanding. Your submission must be created individually and must represent your personal, individual response to the assigned tasks. In other words, you may collaborate to discover how to complete 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/aaq/

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

Equal Opportunity Statement: