Applied Statistics (MATH 4351)

Meeting Times: 10:10-11:05 MWF in RBN 4034

Last day to withdraw: Monday, March 30, 2026.

Instructor: Nathan Smith

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Office Hours: Tentatively 11:15-12:10 MWF

Text: We will be using an online text available on the course canvas page.

Course Topics: Point estimators, confidence intervals, and hypothesis testing, (quickly). Then the main focus will be on regression and classification models: simple linear regression, multiple regression, analysis of variance, logistic regression, discriminant analysis, model selection, and diagnostics. We will consider other topics as time and student interest permit.

Student Learning Outcomes: By the end of the course students should be able to:

1. Fit appropriate regression models to data sets and draw conclusions from the model produced.
2. Fit appropriate classification models to data sets and draw conclusions from the model produced.
3. Apply model diagnostics and variable selection procedures.
4. Be able to compare and contrast competing models.

Computing: Statistics today is done on a computer. We will be using the statistical package/programming language R, which is an implementation of the S programming language designed at Bell Labs. R is available for free from http://www.r-project.org/ for windows, mac, and unix platforms, but probably you will prefer working with RStudio (also free, from https://posit.co/downloads/). This being 2026, you probably have a laptop that you should probably bring to class with you and you should probably install **R** on it.

Grading: We will be having a "test" every other Friday (1/23, 2/6, 2/20, 3/6, 3/27, 4/10, and 4/24). Some of these may need to, because of the nature of the beast here, be at least partly take-home. The point of these is to give you an opportunity to demonstrate proficiency in the topics related to the course. A tentative list of proficiencies is available in the *proficiencies.pdf* file but this may expand somewhat and change (increased precision) over time. On any test date, you are welcome to test on any of the proficiencies (i.e. topics) that we have addressed so far in the course (so, for instance, if for some reason you make it until April 24 and have yet to demonstrate that you can make and interpret basic plots of

the data, you can have another crack at it on the very last test!). A fair amount of our (non test) class time will be practicing these proficiencies.

On each of these proficiencies tested, you will receive an evaluation of your level of mastry, from "Insufficient Evidence of Proficiency" to "Developing Ability" to "Competence" to "Mastery," which, being honest, you can more or less map onto D, C, B, and A respectively. The average of these will constitute 60% of your semester grade. A semester project (basically you will give a roughly 1/2 class period length presentation on a statistics topic, from the book or otherwise, that we won't be able to get to, timewise, in class) will count for 20% of your semester grade. A comprehensive final exam will comprise the remaining 20% of your semester grade.

Student Academic Conduct: It is your responsibility to learn the material in this course for your own benefit. You should not let this discourage you from working together on your homework but in the end what you turn in should reflect your understanding, not just be copied from someone else. *During the tests and the final exam, a code of honor will apply under which students are to work alone and neither give help to others nor receive help from any sources.* Students are also expected to help enforce this code. Students are encouraged to obtain a copy of *A Student Guide to Conduct and Discipline at UT Tyler*, available in the Office of Student Affairs.

Artificial Intelligence: UT Tyler is committed to exploring and using artificial intelligence (AI) tools as appropriate for the discipline and task undertaken. We encourage discussing AI tools' ethical, societal, philosophical, and disciplinary implications. All uses of AI should be acknowledged as this aligns with our commitment to honor and integrity, as noted in UT Tyler's Honor Code. Faculty and students must not use protected information, data, or copyrighted materials when using any AI tool. Additionally, users should be aware that AI tools rely on predictive models to generate content that may appear correct but is sometimes shown to be incomplete, inaccurate, taken without attribution from other sources, and/or biased. Consequently, an AI tool should not be considered a substitute for traditional approaches to research. You are ultimately responsible for the quality and content of the information you submit. Misusing AI tools that violate the guidelines specified for this course (see below) is considered a breach of academic integrity. The student will be subject to disciplinary actions as outlined in UT Tyler's Academic Integrity Policy.

For this course, you may not use AI tools to produce anything turned in for a grade.

University Policies: For University policies concerning Students' Rights and Responsibilities, Grade Replacement/Forgiveness, State-Mandated Corse Drop Policy, Disability Services, Student Absence due to Religious Observance, Student Absence for University-Sponsored Events and Activities, and the Social Security and FERPA Statement please see the link in the course information page in Canvas.