MTH 360: Statistical Inference
Spring 2020

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Office Hours: TWR 3:15-5:00. None on M & F.

Text and Materials:

Course Requirements:

Daily Work: First and foremost, you will always be expected to read in the textbook. I will make reading assignments at the end of each lecture. At times, I will pick homework problems that exclusively relate to reading assignments.

Each day in class there will be a few homework problems from the book given out that are for your practice. The total number of problems assigned works out to about one per calendar day (seven per week). You should keep all of the homework organized in one place and separate from the place where you keep notes from class. Each problem must be started on a separate piece of paper. Do not work two or more problems on the same page. Be prepared to turn in any the assigned problems at any point one week after they are assigned.

How Daily Work is Assessed: Each class meeting of the semester (after the first day) you will turn in one or two homework problems (usually one, but sometimes two). There will not be a homework pick up the day after an exam.

This means you will have approximately 20-25 daily grades. Once homework problems have been assigned for a week, they can be called for at any time – even much later in the semester. That is, a problem assigned on January 23 could be asked to be turned in on January 30 or March 26, etc.

Midterm Exams: Wednesdays will be exams days during Spring 2020. There will be three midterm exams during the semester. All exams are taken outside of class time at a specific time that you sign up for. There is no exception to this. You should plan on three hours of time per exam.

Target Days for Exams: February 12, March 4 and April 8. We will confirm once we get closer.
Final Exam: The final exam is scheduled for Thursday, May 7 from 7:30 AM to 10:40 AM. The final exam is comprised entirely of problems (with numbers changed) from homework and previous exams.

Grading Policy: Everything counts 20%: Exam 1, Exam 2, Exam 3, Final Exam, Homework Average.

Attendance Policy: Be on time. There is no need for an attendance policy in advanced mathematics courses. They are self-regulating.

Formalities Which Must Be Included in This Document:

Academic Integrity (A-9.1)
The penalty for violating Academic Integrity policy A-9.1 at any time during this semester is failure of the course. No exceptions. No grade will be calculated for a student who violates the policy. They will be asked to sign an academic dishonesty form after evidence of their violation has been provided to them and they will receive an F in the course no matter what grades have been accumulated to that point in the semester.

Academic integrity is a responsibility of all university faculty and students. Faculty members promote academic integrity in multiple ways including instruction on the components of academic honesty, as well as abiding by university policy on penalties for cheating and plagiarism.

Definition of Academic Dishonesty
Academic dishonesty includes both cheating and plagiarism. Cheating includes but is not limited to (1) using or attempting to use unauthorized materials to aid in achieving a better grade on a component of a class; (2) the falsification or invention of any information, including citations, on an assigned exercise; and/or (3) helping or attempting to help another in an act of cheating or plagiarism. Plagiarism is presenting the words or ideas of another person as if they were your own. Examples of plagiarism are (1) submitting an assignment as if it were one's own work when, in fact, it is at least partly the work of another; (2) submitting a work that has been purchased or otherwise obtained from an Internet source or another source; and (3) incorporating the words or ideas of an author into one's paper without giving the author due credit.

Please read the complete policy at http://www.sfasu.edu/policies/academic_integrity.asp

Withheld Grades Semester Grades Policy (A-54)
Ordinarily, at the discretion of the instructor of record and with the approval of the academic chair/director, a grade of WH will be assigned only if the student cannot complete the course work because of unavoidable circumstances. Students must complete the work within one calendar year from the end of the semester in which they receive a WH, or the grade automatically becomes an F. If students register for the same course in future terms the WH will automatically become an F and will be counted as a repeated course for the purpose of computing the grade point average.

The circumstances precipitating the request must have occurred after the last day in which a student could withdraw from a course. Students requesting a WH must be passing the course with a minimum projected grade of C.

Students with Disabilities
To obtain disability related accommodations, alternate formats and/or auxiliary aids, students with disabilities must contact the Office of Disability Services (ODS), Human Services Building, and Room 325, 468-3004 / 468-1004 (TDD) as early as possible in the semester. Once verified, ODS will notify the course instructor and outline the accommodation and/or auxiliary aids to be provided. Failure to request services in a timely manner may delay your accommodations. For additional information, go to http://www.sfasu.edu/disabilityservices/.
Course outline:

- **Covariance and Correlation** 10%
  - Introduction to multiple random variables and independence
  - Joint, marginal and conditional distributions
  - Calculation and interpretation of correlation and covariance

- **Sampling and Sampling Distributions** 10%
  - Properties of Normal, t, chi-squared and F distributions
  - Properties of the sample mean and variance

- **The Need for Estimation and Testing: a review of scenarios in which popular discrete & continuous named distributions are used.** 5%
  - Use of experimental conditions in order to identify a parametric family
  - Use of descriptive statistics to identify a parametric family

- **Elements of Testing Hypotheses** 10%
  - Terminology associated with testing
  - Likelihood ratio tests

- **The Popular One Sample Location Tests and Confidence Intervals** 15%
  - Mathematical development of one sample t and z tests (and associated confidence intervals)
  - Analysis of data and computer application for one sample t and z procedures
  - Mathematical development of the sign and signed rank tests
  - Analysis of data and computer application for sign and signed rank procedures
  - Paired data as a one-sample problem

- **The Popular Two Sample Location Tests and Confidence Intervals** 15%
  - Mathematical development of the two-sample independent t-test (and associated confidence interval)
  - Analysis of data and computer application for two-sample independent t-test procedures
  - Mathematical development of the rank sum test
  - Analysis of data and computer application for the rank sum test procedure

- **Tests for Variances and Associated Confidence Intervals** 5%
  - The chi-squared test (and associated confidence intervals) for a single population variance including data analysis and computing/software usage
  - The F test for the equality of two population variances (and associated confidence interval) including data analysis and computing/software usage.

- **One Way Analysis of Variance & Simple Linear Regression** 20%
  - Mathematical development & application
  - Analysis of data and computer application for ANOVA and regression procedures
  - Multiple comparisons in ANOVA, residual analysis in Regression including data analysis and computing/software usage

- **Categorical Data** 10%
  - Chi-squared goodness-of-fit test
  - Tests for Independence/Row Homogeneity for Two Categorical Variables
  - Analysis of data and computer application for categorical data procedures