MA 540A Mathematical Statistics for Teachers

Course Syllabus

Dr. Darien Lauten
Mon. 6:30 - 9:00 PM

Spring, 2004
Three credits

Office Location: Regis top (third) floor
Phone: Office: 603 897 8602
Office Hours: M: 2:00 – 2:30 (Mem), 4 – 5 PM (Regis)
T: 10:00 - 12:00 (Regis), 2:00 - 4:00 (Regis)
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Note that the ½ hour office hours are conducted in the classroom of the course they precede. All students from any course are welcome during those times.

Brief Course Description: Emphasis is placed on interpretation and understanding of concepts rather than computation. This emphasis is accomplished through the use of a statistical package SPSS and real data. Students use data analysis to learn to detect patterns and structure in data. They explore the basic concepts of statistics such as discrete and continuous distributions, numerical summary measures, fitting a line to bivariate data, probability, sampling distributions, estimation, and confidence intervals. In addition, graduate course work includes study of how to teach statistics at the high school level; a written review of research-based studies that address how high school students learn and make sense of mathematical statistics and how they make connections to other topics in mathematics; and a presentation on one of several books about statistics.

A student copy of Minitab.14 or SPSS.

Required Materials (bring to every class meeting): Your textbook, Software Manual, three-ring binder with pockets, hole punch, miniature stapler, and a 6” ruler, two colored pencils. You are also expected to have a graphing calculator and its manual. The overhead-projector calculator used in class will be a TI-83, and your instructor is most familiar with the TI-83. The instructor will also use SPSS in class.

Course Objectives:

• To involve students in the active doing of statistics
• To engage students in mathematical thinking
• To help students learn to differentiate between ethical and unethical use of statistics
• To develop students’ abilities to detect and interpret patterns and structure in real data
• To engage students in developing mathematical models of problems and in solving problems
• To help students learn to read mathematics and to become independent learners of mathematics
• To develop students’ conceptual understanding of the major ideas of probability theory and statistics including, but not limited to, data and distributions (discrete and continuous), numerical summary measures, fitting a line to bivariate data, probability and sampling distributions, point estimation, confidence intervals, and testing statistical hypotheses
• To engage students in the solution of problems, especially open-ended problems
• To develop students’ abilities to write clearly and concisely about mathematical ideas and problem solutions
• To develop students’ abilities to work together, recognizing that we can all benefit by listening to each others’ ideas and approaches and by learning to communicate clearly our own ideas
• To engage students in the use of technology to interpret data
• To give students hands-on experience using hand-on experience using statistical computer software and the TI-83 calculator.
• To help students learn to teach statistics at the high school level;
• To familiarize class participants with research on how high school students learn and make sense of
mathematical statistics and how they make connections to other topics in mathematics;
• To familiarize students with one of the several "popular" mass market books about mathematical
statistics.

Teaching Strategies:
• Active student engagement in group work and discussions
• Exploratory, intuitive activities that involve students in doing mathematics
• Large and small-group discussions with an expectation of student participation and questioning
• Student reading of mathematics and studying of examples
• Student writing about mathematical ideas
• Problem solving activities that involve the use of computers and sophisticated calculators
• Lab activities using computer software
• Student presentations
• Weekly quizzes

Course Requirements:
• Homework (collected or checked each class period)
• Attendance at all scheduled class meetings
• Active participation and engagement in full-class and small-group discussions and activities
• Labs
• Graded assignments and project(s)
• Weekly quizzes
• Tests (at least 2) and a cumulative final examination
• Literature review research on how high school students learn and make sense of mathematical statistics
  and how they make connections to other topics in mathematic statistics
• Presentation based on reading of a "popular" book about statistics

Methods of Assessment and Computation of Grades:
Preparation for each class and timely completion of homework                            10%
Active engagement in class activities and discussions, attendance, punctuality,
and respect for others                                                            10%
Quizzes (10% of quiz grades will be dropped) and graded assignments                  20%
Tests, and final examination                                                        45%
Literature review                                                                     8%
Presentation on book about statistics                                               7%

Resources
Mathematics Conference Room (in Regis Hall, see the MACS Administrative Assistant if the room is
locked). Please feel free to use the Mathematics Conference Room whenever a faculty meeting is
not being held (see schedule on door). FYI: The Math Conference Room:
Contains many other statistics books with solutions.
Is a great place to meet others from your class for collaboration on assignments.
Is near my office for quick questions when you get stuck.
Is a cozy place to study. (You can bring food as long as you clean-up after yourself.)
Please visit during my office hours and send email with your questions.

Classroom Policies
• Attendance will be taken each class period. You are expected to attend all classes. Missing classes
will affect your grade, unless you provide a documented reason for your absence. If you miss
class, you are responsible for getting the notes from a classmate submitting assigned work on time,
and returning to class with all assignments up to date. To be "excused" from a class you must
provide documentation from a professional source (physician, court, funeral director, campus nurse, etc.) If you must miss class because of serious illness or emergency, please inform me as far ahead as possible by note, email, or phone message. Students on athletic teams must provide written notice of forthcoming athletic events at least two class meetings before the absence.

- Assignments, computer labs, and projects are due on the assigned date whether or not you are present in class. Full credit is given only for assignments handed in on time. Late assignments are worth ½ credit and must be submitted before the test on the chapter. If you must miss class, place your assignment in the mailbox by my office door.

- Each week there will be a short quiz on material presented the previous class meeting. Ten percent of your quiz grades will be dropped. You may not make up a missed quiz. A quiz missed for any and all reasons counts toward the 10% of dropped quiz grades.

- In order to make up a missed test or final examination, you will need a documented note. (See above). Again, quizzes may not be made up. (See above).

- Read lightly each section before we discuss it in class. After we have gone over a section in class, reread and study the section. I intend to help you learn to read mathematics. You are responsible for all assigned material. To the extent time allows, I will cover all material in class before it is assigned. Studying each section means working out the book examples on your own.

- Class participation and active engagement in the class discussions and activities, and group work are required and will reflect in your grade.

- You should expect to average five to eight hours studying for this class each week. This includes reading the textbook, working out text examples on your own, reviewing and “filling-in” class notes, doing assignments and graded assignments, and preparing for tests and examinations. If your studying requires significantly more time than this, please see me. You may be underprepared for the course and together we will need to discuss and seek a remedy for the situation. Similarly, if you are spending significantly less than this amount of time, perhaps you already know this material and should be in a different course.

- All work submitted on tests must be entirely your own. Test questions may not be discussed with other class members. Behavior contrary to this will result in a failing grade and written notification to the department chair and dean for appropriate action.

- If you miss more than 3 hours of class (one class meeting), your name will be turned in to the department chair and dean. You also must make an appointment to see me to discuss the advisability of your remaining in the course for the remainder of the semester.

- Any behavior that is disruptive to others will not be tolerated.

- Please silence cell phones in class. They are disruptive to the instructor and other students. If, in an emergency, you must respond to a silent incoming message, please leave the room quietly and respond in the hall after you have closed the classroom door quietly.

- You are expected to hold full responsibility for your learning and to seek out opportunities for independent learning.