

Course Syllabus: MA 540 A Applied Statistics for Teachers

To make it apparent, the extra work that you have to do as grad students is in bold type. This consists of

(1) High school lesson plan involving some topic in mathematic statistics.

(2) Presentation based on study of an AP Statistics text or "popular" book about statistics.

Dr. bil bonnice

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Tu. 6:30 - 9:00 PM

Three credits

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Office Hours:

Mon. 10:00 - 11:00 AM (ED 313); 2 - 4 (Regis 303); 5:30 - 6:30 PM (ED 313)

Wed. 10:00 - 11:00 AM (ED 313); 5:30 - 6:30 PM (STH 230)

Fri. 10:00 - 11:00 AM (ED 313)

Note that, except for the Mon. 2 - 4 (Regis 303) office hours, the other 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.

Required Course Textbook: Devore, Jay L. & Farnum, Nicholas R. (2005), Second Edition, *Applied Statistics for Engineers and Scientists*, ISBN: 0-534-46719-9, Thomson/Brooks-Cole, Belmont, CA.

Required Materials (bring to every class meeting): Your textbook, a graphing calculator.

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 AP statistics books or "popular" statistics books.**

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 SPSS computer software

- Student presentations
- Tests and a take-home mid-term

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 (2), take-home mid-term, and a **cumulative** final examination
- **High school lesson plan involving some topic in mathematic statistics**
- **Presentation based on study of an AP Statistics text or "popular" book about statistics.**

Methods of Assessment and Computation of Grades:

Preparation by reading the material before each class and timely completion of homework	20%
<u>Active engagement</u> in class activities and discussions, attendance, punctuality, and respect for others.	10%
Tests (2)	20%
Mid-term (take-home)	15%
Cumulative final examination	20%
Self-evaluation (See last page, below)	5%

Lesson Plan	5%
Presentation on book about statistics	5%

GRADING OF THE HOMEWORK:

I will not have time to grade each problem individually. Instead I will be checking that you have done the homework. I will rely on you to check your own work with the answers in the back of the book or by checking with me, the Math Dept. tutors, or your fellow students. Also, if you are not sure of your solution, write down *specifically* what you are not sure about and ask about it in class. I will get an overall impression of each assignment that you turn in and award it a check plus(110%), a check(100%), a check minus(80%), or a check minus minus(60%). **You can get full credit for any problem that you can't do, by asking a specific question whose answer will help you solve the problem.** There will be no credit given for late homework. It is important to keep up with your work.

COOPERATION IS THE NAME OF THE GAME:

We're all here to learn and we'll learn easier and have more fun if we all work together to help one another learn. I expect you to relate to one another as mutual helpers rather than competitors. I'd like all students in my classes to have a cooperative attitude about helping one another to understand and learn. I plan activities that require you to work in collaborative groups and I expect that individuals will presentation the results of group work in front of the class to enhance our learning. Our goal is for us to build a supportive learning climate in which we have a productive and enjoyable semester. We're in this together. We sink or swim together.

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 me and send e-mail 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.
- In order to make up a missed test or final examination, you will need a documented note. (See above).
- Read 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 material in class before it is assigned. Studying each section means working out the book examples on your own. Try to do each example on your own **before reading its solution in the text**.
- 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 under-prepared 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. On in-class tests, 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 turn off cell phones in class. Cell phones are disruptive to the instructor and other students whether you are talking, listening, reading, or text messaging. If you are a caregiver of young children, please notify me so I am aware of the exception to this rule. If you are a caregiver and, 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.

Americans with Disabilities Act (ADA): Rivier College wants to provide reasonable accommodations to students with disabilities. To accomplish this goal effectively and to ensure the best use of our resources, the College expects students to provide timely notice of a disability to the Office of Special Services for verification and for evaluation of available options. Any student whose disabilities fall within ADA should inform the instructor within the first two weeks of the term of any special needs or equipment necessary to accomplish the requirements for the course. To obtain current information on this procedure, contact the Office of Special Services at telephone extension 8497.

Academic Honesty

Plagiarism and cheating are serious breaches of academic honesty. In general, plagiarism is defined as the presentation of someone else’s work in whatever form: copyrighted material, notes, film, art work, reports, statistics, bibliographies, and the like, as one’s own, and failing to acknowledge the true source. Quoting word-for-word, or almost so, or using the argumentation of another source without acknowledging this dependence also constitutes plagiarism. Cheating is defined as the giving or attempting to give or to receive unauthorized information or assistance during an examination or in completing an assigned project. Submission of a single work for two separate courses without the permission of the instructors involved is also a form of cheating.

If students are unsure whether a specific course of action would constitute plagiarism or cheating, they should consult with their instructor in advance.

Penalties for plagiarism and cheating vary with the degree of the offense and may take the form of the following academic sanctions:

- the grade of F for the work in question;
- the grade of F for the course;
- notification of the department chair and/or Academic Dean of the College of the misconduct of the student;

recommendations that the student be suspended or dismissed from the College.

Statement on Attendance

The classroom is the heart of the educational experience at Rivier College because it provides, uniquely, a formal setting for the important exchanges among faculty and students. Regular and punctual attendance at all classes, essential for maximum academic achievement, is a major responsibility of Rivier College students. Failure to attend and contribute to the classroom environment significantly and demonstrably reduces the quality of the educational experience for everyone in the classroom. As a result, absences almost always impact quality performance.

As part of its commitment to a quality educational experience for all members of the Rivier community, the College formally requires specific attendance policies to be developed by its professors and reviewed by their Chair and Dean. Any form of attendance used by an individual professor as a criterion for evaluation must be specified in the course syllabus and presented to students during the first week of classes. These policies may include reasonable penalties and sanctions for excessive absences.

In the event of prolonged illness, accident, or similar emergency, it is the responsibility of the student to notify both the professor and the Office of the Dean. Students must remember that it is always their responsibility to make up the work they have missed during an absence from class. Students are directed to confer with their professors when their absences jeopardize satisfactory progress. Whenever a professor is absent without notification, students are expected to wait fifteen minutes before leaving and to sign an Attendance List, which a class member delivers to the Office of the Dean.

Instructors are required to record attendance and alert the Registrar when a student fails to attend the equivalent of two consecutive weeks of courses (2 absences for a course meeting once a week, 4 absences for a course meeting twice a week, 6 absences for a course meeting three times a week). The student will then be alerted that he/she is in danger of falling under the "habitual non-attendance" policy" (see below).

Habitual Non-Attendance Policy

Habitual non-attendance of a course or courses will be considered academic misconduct subject to withdrawal from the course(s) not attended. Habitual non-attendance is defined as an absence in any course (for any reason whatsoever) equating to three full weeks of missed class sessions (3 absences for a course meeting once a week, 6 absences for a course meeting twice a week, 9 absences for a course meeting three times a week).

It is the responsibility of the student to notify the College of any intention to withdraw from a course or withdraw from the College. The College will attempt to resolve the issue of habitual non-attendance with the student; however, the College reserves the right to withdraw students who are no longer attending courses. Habitual non-attendance in one or more classes may result in administrative withdrawal from the class or classes affected withdrawal from the College or, in cases with extenuating circumstances, an administrative leave of absence. In such cases a grade of W or NF will be assigned to the classes affected according to the appropriate date published in the academic calendar.

Students who have attended no class sessions of a course or courses from which they are registered by the end of the drop/add period will be dropped from each class not attended. If a student never attended any courses during the drop/add period, the student will be withdrawn from his/her full schedule of courses.

NOTE: You are responsible for understanding and complying with the contents of this syllabus. If you have any questions about this syllabus please raise them at any time during the semester.

Applied Statistics Self-evaluation

This Self-evaluation will be due on Tuesday, April 24, but I would prefer it on April 17. It will count as 5 per cent of your grade. You will be scored on the quality of your evaluation of yourself, your work in this course and your progress and understanding. In other words, you could say that you deserve a low grade in the course and give good reasons for that and receive maximum credit on this Self-evaluation. On the other hand, you could say that you deserve an "A" in the course and receive a low score on the Self-evaluation because you did a poor job justifying your claim for an "A".

1) **Note: Grades are based on understanding, competence and achievement, not on effort. It usually takes a lot of effort to achieve these but effort alone, without achievement, understanding, and competence in the subject matter, does not warrant a passing grade.**

In addition to stating what grade you think you deserve in the course, along with justification, you should evaluate yourself on the following:

2) How well did I work with my classmates in and out of class?

3) How much did I work outside of class and how was the quality of that work? Before each class did I study the upcoming material in the text thoroughly with a pencil and paper at hand to try to work out examples **before** reading them. Did I try to work out things I didn't understand? Did I write down questions to be answered in class? How well did I do on the homework and how much time did I put in on it? What was the quality of my effort?

4) TESTS: How did I do on them? How well did I prepare for them? After receiving them back, did I consult with my classmates about them and compare my answers with theirs? Wherever I made a mistake, did I either figure out my mistake or compare my work with the answer sheet until I understood where I went wrong?

5) IN-CLASS PARTICIPATION: Did I ask questions in class? How much did I contribute to class discussions?

6) UNDERSTANDING, PROGRESS, and ACHIEVEMENT: How much did I learn and understand in this course? Did I meet my expectations? How much progress did I make? (Compare where you are now to where you were at the beginning of the course. Has there been much change?) What have you achieved in this course?

7) CRITIQUE OF THE PROFESSOR: What did you like least about my teaching? What did you like most? Suggest at least one thing that I could do to improve my teaching.

8) CRITIQUE OF THE COURSE: What did you like least about the course? What did you like most? Suggest at least one thing that could be done to improve the course.

9) CRITIQUE THE TEXT:

10) MISCELLANEOUS: Here say anything else you'd like to say.