Math 332   Mathematical Statistics II
Spring 2006
Instructor: Kay B. Somers
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Office Hours: Monday., Wednesday, and Friday, 10:15 to 11:15 a.m .; Wednesday 1:30 to 2:30 p.m.; and by appointment.

Text: *Mathematical statistics with applications,* Dennis D. Wackerly, William Mendenhall III, Richard Scheaffer, (2002), Sixth Edition. Duxbury Thomson Learning.

Course goals: This course is a continuation of Mathematical Statistics I and will concentrate on topics related to statistical inference. We will also study multivariate probability distributions. After completing this course, successful students will:

- understand probability distributions involving more than one variable;
- solve a variety of statistical inference problems and understand real world situations that give rise to them;
- learn to make transitions between verbal descriptions, symbolic representations, and numerical descriptions related to statistical analyses;
- be able to apply the appropriate techniques to analyze data and formulate a conclusion from the statistical analysis;
- understand the role of statistics in scientific and medical investigations as well as public policy and personal decision making; and
- be able to explain clearly, both orally and in writing, how the results of their statistical analyses relate to the context from which they were obtained.

Course topics: The study of statistics addresses situations involving uncertainty, data analysis, inference, and decision making. The course will cover some transition topics in Chapters 5, 6 and 7, some additional topics in Chapters 8 and 9, and most topics in chapters 10 through 14. If time permits we will introduce some topics in Chapter 15. The topics to be covered include the following: review of the Central Limit Theorem, point estimation and confidence intervals; hypothesis testing; least squares and linear models; analysis of variance; chi-square tests and goodness-of-fit; and non-parametric statistics, if time permits.

Homework: Since mathematics can only be learned and understood by doing, reading and homework problems will be assigned during each class and usually will be discussed during the next class. You are expected to come to class prepared to explain problem solutions and ask questions. Students will be randomly called onto answer questions on the reading and problems for that day. The homework will involve a variety of types of activities, including some writing assignments and some longer assignments that could be called projects. Some of these outside–of-class assignments will be collected and graded. In all homework assignments that will be graded, you will be told in advance that the work will be collected. Late homework will be accepted only if you are absent due to illness or emergency. You are encouraged to study and work together on **ungraded** assignments; however, **all homework that is to be collected and graded is to be done <u>individually</u> unless otherwise noted.**

Academic Honesty: For graded homework assignments, you may use your class notes and any books or library sources. However, you may not use the help, orally or in written form, of any individual other than your instructor unless it is specifically a group assignment, and you may not copy someone else's work. If an assignment is completed by a group of two or more people, each person who contributed to the work must put his or her name on the work. The College academic honesty policy appears in your Student Handbook; you are expected to be familiar with it. The *Academic Honesty Policy Guidelines* specific to mathematics classes are clarified at the end of this syllabus. They apply to work done outside of class as well as to in-class quizzes and tests. Please read them carefully. If you are unsure about the propriety of a particular procedure or approach for completing assigned work in this course, please consult with your instructor before continuing with the assignment.

Grading: In addition to homework and projects, there will be three hour exams, and a mandatory, cumulative final exam. Your course grade will be computed as follows: class participation, 10%; graded homework and projects, 25%; three hour exams, 15% each; cumulative final exam, 20%.

At least one of the hour exams will be a take-home exam. The three hour exams are tentatively scheduled for the following dates:
      Monday, February 13
      Wednesday, March 22
      Friday, April 21
You are responsible for knowing about any changes to the test dates made during class.

.**Attendance: S**tudents are required to attend all classes. Some of the statistical concepts will be demonstrated through class activities done in small groups during class. In order to participate, you must be in class. If you are absent, you will not receive credit for the day's activity. You are also responsible for obtaining all class handouts and keeping them organized. Students should inform the instructor of any unavoidable absence in advance, if possible. Make-up exams will be given only in the case of a documented illness. You are encouraged to ask questions in class and to see Dr. Somers for extra help outside of class.

Classroom etiquette: You need to come to class prepared. This means that you have carefully read the assigned material, you have worked (seriously) on the assigned problems and you have your notebook, your textbook, and your calculator with you. You are ready to ask and answer questions in class and to work with your classmates on any in-class group activities. This classroom needs to be a place where everyone feels comfortable asking and answering questions; you are expected to treat everyone in class with respect. You need to turn your cell phone and any other electronic devices off and put them away during class. Finally, you are expected to be on time for class, to stay until class is over and not leave the class unless there is an emergency. (It is very disruptive, especially to your instructor, to have people walking in and out of the classroom when learning is in progress.)

Technology: We will use the computer programs *Maple* and *Excel* to help explore, graph, understand and solve some problems in this class. You will also need a graphics calculator for exams and homework assignments.

ACADEMIC HONESTY POLICY GUIDELINES

MATHEMATICS COURSES

The Department of Mathematics and Computer Science supports and is governed by the *Academic Honesty Policy of Moravian College* as stated in the Moravian College Student Handbook. The following statements will help clarify the policies of members of the Mathematics faculty.

In all homework assignments which are to be graded, you may use your class notes and any books or library sources. When you use the ideas or thoughts of others, however, you <u>must</u> acknowledge the source. For graded homework assignments, you may not use a solution manual or the help, orally or in written form, of an individual other than your instructor. If you receive help from anyone other than your instructor or if you fail to reference your sources you will be violating the *Academic Honesty Policy of Moravian College* . For homework which is not to be graded, if you choose, you may work with your fellow students. You are responsible for understanding and being able to explain the solution of all assigned problems, both graded and ungraded.

All in-class or take-home tests and quizzes are to be completed by you alone without the aid of books, study sheets, or formula sheets unless specifically allowed by your instructor for a particular test.

In addition to the above guidelines, you may be asked to sign the following pledge when you hand in your assignments:

I have completed this work using only allowable resources, and have not consulted anyone other than my instructor in the process of completing this assignment.

Signed: _____   Date: _____