

<u>Spring of 2007</u>	<u>Barbara Tanzyus</u>
Course number: MGT-150	Office: Charles E. Becker Library – Lower level – L18
Course title: Statistics	Office hours: By appointment
Times: 6:00 - 10:00 p.m.	Office phone: 525-1420 X555
Course days: Thursday	Home phone: 217-529-6296
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Statistics (MGT-150)

Benedictine University's Conceptual Framework:

Benedictine University educators are effective practitioners, committed to scholarship, lifelong inquiry, leadership and social responsibility. As a result of this course, you will be expected to demonstrate:

- scholarship by developing a firm understanding of the content of the course;
- lifelong inquiry by actively seeking out answers to your emerging questions;
- leadership by assuming roles that improve practice, such as initiating discussions, serving as a group leader and volunteering;
- social responsibility by exploring ways to maximize the potential of all learners.

Course Description:

From the Benedictine University/Springfield College in Illinois Academic Catalog: "Basic course in statistical technique; includes central tendency, variability, probability theory, sampling, estimation and hypothesis testing. For Business Majors" (2006-2007 Academic Catalog, p. 66) The number of hours for this course is three.

Required textbook and materials:

The text for this course is Understanding Statistics, Eighth Edition, By: Charles H. Brase and Corrinne P. Brase. This text is published by Houghton Mifflin Company and has an ISBN of 0-618-49658-0. This book was copyrighted in 2006. Additionally, Microsoft Excel will be used for problem solving in a computer laboratory environment. A calculator with a minimum of a square root key and a squared key is also required in every class and should accompany the student for problem solving during the discussion day. Important documents also provided for this course include

homework assignment listing, application/Critical Analysis Survey Assignment sheet, Classroom Environment and Student Responsibility document and this syllabus.

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Course goals, objectives and outcomes:

A: Goals

Utilization of probability and statistics and the application of the material to the real world is the focus of the course. Awareness of that utilization within the world around us will be a focus along with learning how to calculate meaningful statistical numbers for that usage. The overall course outcome will be that the student will have a better awareness of the use and application of statistics in the world around them.

B: Objectives: Springfield College is committed to preparing students for a life of learning, leadership and service in a diverse world. As a result of the College's Associate Degree Programs, graduates will develop:

Content Knowledge (Lifelong Learning)

- **CK-1** Know and apply the central concepts of the subject matter
- **CK-2** Use current research to support assumptions and beliefs
- **CK-3** Use technology to enhance learning

Communications Skills (Lifelong Learning and Leadership)

- **CS-1** Communicate effectively in oral and written forms

Problem-Solving Skills (Lifelong Learning and Leadership)

- **PS-1** Use inquiry and collaboration to solve problems
- **PS-2** Seek information and develop an in-depth knowledge base, grounded in Research on Teaching
- **PS-3** Use self-reflection to enhance personal growth and understanding of content

Social Responsibility (Service and Leadership)

- **SR-1** Evaluate how choices and actions affect others
- **SR-2** Make ethical and informed decisions
- **SR-3** Develop good citizenship

Global Perspectives (Diversity)

- **GP-1** Recognize the importance of diversity of opinion, abilities and cultures

Self Direction and Personal Growth (Lifelong Learning)

- **SD-1** Develop a sense of intellectual curiosity

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Course goals, objectives and outcomes (continued):

C: Course Based Student Learning Objectives.

Upon completion of the course, students will be able to demonstrate their mastery of the following learning outcomes, addressing the following CLSO's (in parenthesis)

- **CBSLO-1:** Students will be able to identify and explain terminology that is related to statistics and probability in their own words and apply those concepts to real world data and general datasets for effective communication of statistical ideas. (CK-1, CS-1, PS-3, SD-1)
- **CBSLO-2:** The student will learn to interpret and analyze data in order to provide appropriate graphical representations illustrating the underlying dataset. (CK-1, CK-2, CS-1, PS-1, PS-3, SD-1)
- **CBSLO-3:** The student will be able to calculate and interpret statistical measures and apply those concepts to data of all types. (CK-1, CK-2, CK-3, PS-1, PS-2, PS-3, SD-1)
- **CBSLO-4:** The student will be able to read and interpret statistical problems and calculate statistical measures appropriate to communication and explanation of the dataset with numbers, graphical representations and words. (CK-1, CK-3, CS-1, PS-1, PS-2, PS-3, SD-1)
- **CBSLO-5:** The student will be able to construct a survey, collect data, research the survey topic and communicate the results in a written document using words, graphical representations and numeric statistical measures appropriate to fully explain the dataset. (CK-1, CK-2, CK-3, CS-1, PS-1, PS-2, PS-3, SD-1)
- **CBSLO-6:** The student will be able to interpret probabilistic models and apply those concepts to problem solving with probability problems; Communication of those results numerically, graphically and verbally is an overall goal. (CK-1, CK-3, CS-1, PS-1, PS-3, SR-1, GP-1, SD-1)
- **CBSLO-7:** The student will be able to interpret when to use statistical distributions when working with datasets and calculate the appropriate statistical measures for that application. (CK-1, CK-3, CS-1, PS-1, PS-3, SD-1)

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Teaching Methods:

This course will require your participation. "Mathematics is not a spectator sport." (Smith, "The Nature of Mathematics", 2004)

Learning the material is your responsibility. If you do not understand something, it is your responsibility to figure it out to insure your success in the course. Teaching methods used will vary depending on the material presented. Methods used include: collaborative classroom problem solving and discussion, small group problem solving, computer laboratory assignments as time permits, in class problem solving with discussion, writing assignments dealing with Statistics, homework assignments with problem solving in probability and statistics, a comprehensive survey assignment with critical analysis of results using the statistics learned in the course, individual presentation of work and survey assignment, reflective applications of the material to the real world and short assessment papers on the student's current level of understanding and areas of concern. Lecture will only be employed as needed. For a full description of the classroom, please refer to the Classroom Environment and Student Responsibility document which is provided with the syllabus.

Course requirements, class attendance and late work:

Attendance policy: An attendance sheet will be provided for you to sign in when attending class. These sheets will be used to provide the administrative offices with attendance records. If you cannot attend class, it is your responsibility to make up the work missed for classes missed. Each class will include activities to teach the materials that may not be in the textbook making attendance important. There will be an overall letter grade penalty for those missing greater than 10% of the classes and this determination will be at the discretion of the instructor. (SR-3, SD-1)

Homework: Attached is a sheet showing the projected daily homework assignments for this semester. Though homework is not collected each day, students need to come to class with the homework completed to the best of their ability in order to clarify concepts that are you misunderstand before moving on to new material. The student will need to turn in the homework for chapters tested on the Chapter Test day. There

will be a late penalty for work turned in after the deadline. (CK-1, CK-2, CK-3, CS-1, PS-1, PS-2, PS-3, SR-3, GP-1, SD-1)

Quizzes: Quizzes will be used to determine your understanding of the materials that will be tested on. Quizzes will be collected at the discretion of the instructor. These items assist me in determining the level of understanding of the students and the future direction of the class. Quizzes will be due on the day that the Chapter Test is given for that material. Quizzes are given randomly depending on the student's needs. There will be a penalty for work turned in after the deadline. (CK-1, CK-3, CS-1, PS-1, PS-3, SD-1)

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Course requirements, class attendance and late work (continued):

Applications: Attached is a partial list of the applications of mathematics to your field of study that you need to explain or locate. These assignments provide the student with the opportunity to step back from the course and attempt to see where this work will affect their careers and enhance their future success. Additional applications will be added to the course for further application of the material to the real world and in practice. Applications are also by chapter and have the same deadlines as homework. There will be a penalty for work turned in after the deadline. (CK-1, CK-2, PS-3, SR-1, SR-3, SD-1)

Assessment papers: Each day the student will be asked to write on their understanding and completion work from the prior session. This should begin each day and be handed in for immediate attention by the instructor. Credit for assessment papers items will be a portion of your homework. (CK-1, CS-1, SD-1)

Chapter tests: The date for the Chapter tests will be set based on the progress of the class, student understanding of the material and a discussion prior to scheduling. A review sheet will be provided for the test in order for the student to know what topics will be included on the test. On tests, the most important concept is to show your work to solve the problem. This work will be graded to see if the student understands the concept tested. To truly assist you in understanding the material, I need to see your work. **There will be a penalty for tests taken after the deadline unless the student calls within 24 hours of the scheduled test day to reschedule a testing time. For take home tests, the same concept applies to the deadlines.** (CK-1, CK-3, CS-1, PS-1, PS-3, SD-1)

Critical Analysis Survey Assignment: Each student will write a survey and distribute it. The student will then write up the survey results using statistics, present the

results in class and turn that paper in for a final grade. This will allow the student to see where their newly gained knowledge can be used in an interactive environment. Parameters for the papers are provided on the attached applications sheet. There will be a full letter grade penalty for late projects. (CK-1, CK-2, CK-3, PS-1, PS-2, PS-3, SR-1, SR-2, SR-3, GP-1, SD-1)

Final exam: The final exam will be comprehensive. The final exam will be given on the date provided by Springfield College on the final exam schedule. Finals will be given in D-105. A review sheet will be provided for this exam prior to the exam. (CK-1, CK-3, CS-1. PS-1. PS-3, SD-1)

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Style requirements:

No specific style is required. APA format is preferred but not required. All work should be neat, clearly numbered and easy to read.

Grade determination:

Here is the grading scale and basis of overall course grade:

Grading scale		Assignments	Percent of total grade
100% to 90%	A	Applications and quizzes	15% of total
89% to 80%	B	Assessment papers and Homework	15% of total
79% to 70%	C	Chapter tests	30% of total
69% to 60%	D	Critical Analysis Survey Assignment	20% of total
Below 60%	E	Final exam	20% of total

If you anticipate a conflict with test day, please discuss an alternative testing date with me. If you have an unanticipated emergency, please contact me within 24 hours of the test date in order to set up a make-up time.

Academic honesty and policy: Plagiarism Evidence of plagiarism, taking credit for work completed by another person or student in this class or any other form of academic dishonesty will result in an F on the assignment in question and an F in the course depending on the extent of the dishonesty. The search for truth and the dissemination of knowledge are central missions of the university. Benedictine University pursues these missions in an environment guided by our Roman Catholic tradition and our Benedictine heritage. Integrity and honesty are therefore expected of all members of the University community, including students, faculty members, administration and staff. Actions such as cheating, plagiarism, collusion, fabrication, forgery, falsification, destruction, multiple submission, solicitation and misrepresentation are violations of these expectations and constitute unacceptable behavior in the University community. The penalties for such actions can range from private verbal warning, all the way to expulsion from the University. The University's Academic Honesty Policy is available at <http://www.ben.edu/AHP> and students are expected to read it.

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Course schedule:

A document is provided showing the homework assignments, application assignments and the Critical Analysis Survey Assignment. Course progress is based on student understanding and therefore is not a week by week progression. Topics and objectives for this course include:

Chapter One objectives: The student will learn to classify data in terms of the language of statistics and will learn to describe simple random sampling, systematic sampling, cluster sampling and stratified sampling and provide examples for these items. Language from this section is critical to further understanding of the future materials in this course. There are three sections included in this chapter.

Chapter Two objectives: The student will learn to group data into tables and construct graphs from those tables. More specifically, the student will learn to create and interpret a histogram, pie chart, line graphs, a stem and leaf diagram and other miscellaneous graphs. The student will want to be able to identify patterns in these graphs for use in their Critical Analysis Survey Assignment. Graphing is a critical skill to statistics. Graphing will also be presented in computer laboratory assignments as time permits. There are three sections in this chapter.

Chapter Three objectives: The student will need to be able to fully illustrate, calculate, interpret and explain calculations for mean, median, mode and standard deviation for all types of data sets provided. In this section this includes individual data points and grouped data. Students will also learn to illustrate and calculate inter-quartile ranges and provide a Box and Whiskers plot illustrating these derivations. Assignments will also be presented in the computer laboratory assignments as time permits to simplify calculations. There are four sections in this chapter.

Chapter Four objectives: The student will need to apply the rules of probability of a discrete sample space to determine the likelihood of an event. The student will need to know the difference between discrete and continuous data sets and what it means to be a sample space. Independence and dependence of the sample space will need to be identified. Language for the chapter is critical for full understanding. Participatory experiments will be performed in class during this chapter which makes attendance during this section critical. There are three sections in this chapter though lectures will not depend on the text due to the presentation the text provides.

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Course schedule (continued):

Chapter Five objectives: The student will learn to determine a sample space for a given binomial experiment and determine the probability of any given event in the sample space and fully illustrate and calculate the mean and standard deviations for this type of experiment. The student will need to be able to classify experiments as to whether they are of a binomial nature or not. Graphing of histograms is a critical skill to success in this chapter as well as language. Only three sections of this chapter will be covered.

Chapter Six objectives: The student will learn to distinguish between discrete and continuous data sets. The student will learn to construct a Gaussian curve and illustrate the probability of a normally distributed variable on that curve. The student will learn the properties of the Gaussian curve and to illustrate the Empirical Rule on a Gaussian curve. The student will need to learn to fully illustrate, utilize and calculate z-scores and find the area under the curves associated with those scores. Language and graphing skills are critical to student success. This chapter contains four sections.

Chapter Seven objectives: The student will need learn to state and apply the Central Limit Theorem and determine which type of sampling distribution applies to the dataset. Calculation and fully illustration of method for sample means and standard deviations and graphing using the appropriate mode will be skills the student will need to demonstrate. There are three sections in this chapter but coverage of the sections will vary by semester.

Chapter Eight objectives: The student will need learn to calculate, interpret and illustrate on a Gaussian curve a confidence interval based on varying conditions on the initial assumptions. They will learn to determine the variables needed for calculation and clearly document those assumptions. The student will need learn to vary the margin of error or alpha level and explain the differences. There are five sections in this chapter and the coverage of the sections will vary by semester.

Chapter Nine objectives: The student will learn to fully illustrate, document and calculate a hypothesis test including assumptions according to a prescribed step by step method. Full documentation of each step is necessary to promote full understanding of the overall result. The student needs to be able to write up the final result into a paragraph that describes the purpose of the test. Language of statistics is a critical element for full understanding of this method as terminology is utilized throughout the step by step method. This is a necessary and critical part of the Critical Analysis Survey Assignment. There are seven sections in this chapter and coverage of these sections will vary by semester.

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Special needs (ADA):

Benedictine University at Springfield College in Illinois provides individuals with disabilities reasonable accommodations to participate in educational programs, activities and services. Students with disabilities requiring accommodations to participate in college-sponsored programs, activities and services or to meet course requirements should contact the Dean of Student Affairs as early as possible.

Assessment:

Goals, objectives and learning outcomes will be assessed in this course will be completed by the Assessment Papers and all assignments provided in this course. Assessment is a requirement for the accreditation of the coursework and will be utilized for constantly changing and improving the learning experience for the student.

Illinois Articulation Initiative:

MGT-150 has been approved by the Illinois Articulation Initiative as meeting the criteria stipulated for iTransfer Course MI902 (as follows): **MI 902 General Education Statistics (3-4 semester credits)**

Focuses on mathematical reasoning and the solving of real life problems, rather than on routine skills and appreciation. Descriptive methods (frequency distributions, graphing and measures of location and variation), basic probability theory (sample spaces, counting, factorials, combinations, permutations and probability laws), probability distributions (normal distributions and normal curve, binomial distribution, and random samples and sampling techniques), statistical inference (estimation, hypothesis testing, t-test and chi square test and errors), correlation and regression, and f-test and analysis of variance. Prerequisite: C or better in intermediate algebra and geometry. For more information, please visit the iTransfer website at <http://www.itransfer.org/IAI>.

Format for Assignments:

Students will need to turn in assignments that will provide the instructor with a professional picture of the student. Work will need to be neat, well organized and clearly labeled in order to receive full credit for workmanship. Assignments need student name or names, assignment name or type, page numbers (where applicable), section number (where applicable), and items assigned. Examples of assignments types include homework, applications, quizzes or in class collaborative assignments, assessment papers and Critical Analysis Survey Assignment. The Critical Analysis Survey Assignment needs follow the format in the applications document. Neat and precise work is the product of professional workmanship.

Good luck with your attempt at this course. Let's try to learn the material and enjoy the mathematics.