UNIVERSITY of MASSACHUSETTS DARTMOUTH
Charlton College of Business
Decision and Information Sciences
Fall 2010

COURSE:	POM 500 Statistical Analysis, ONLINE EDITION, Fall 2010 Prerequisite: Finite Math – MTH 103 *(or equiv.)*
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OFFICE HOURS:	By appointment
Course Website:	**http://dartmouth.umassonline.net/index.cfm**

COURSE DESCRIPTION

This one-semester online course examines descriptive and inferential statistics with business applications. It takes an applied approach that focuses on the concepts, applications, and interpretation of statistical analysis in functional areas of accounting, economics, finance, management and marketing. Throughout this course students will utilize appropriate computer software to perform statistical analyses. Students will learn how to make decisions using facts and data. In this course emphasis is on application of statistical concepts and methods as practiced in business. Students will also utilize real-life database problems, homework assignments, quizzes & practice exams during the course.

COURSE OBJECTIVES

This course will examine basic statistical concepts. Emphasis will be given to the understanding of measures of central tendency, variation and basic probability distributions and confidence interval estimations. The course is aimed at organizing data, interpreting statistical charts and estimating. The focus of topics is concentrated on the ability to interpret numerical data as related to business.
From this course you will:

- Be able to develop statistical thinking with the understanding and management of variability
- Be introduced to basic probability and probability distributions.
- Be introduced to the importance of tables and charts for business decision making
- Be able to calculate measures of central tendency and dispersion and their graphical representations.

- Be able to develop interval estimates of the population mean and proportion utilizing confidence interval methods along with applied interpretations.
- Understand how to utilize hypothesis-testing techniques to test business applications.
- Be introduced to methods of regression & correlation analysis
- Be introduced to the Analysis of Variance and Experimental Design
- Be able to apply a statistical technique to a real-life applied case project.
- Understand how to utilize statistical software on the computer and interpret results.

COMPETENCIES AND CONTACT HOURS

Competencies *The student will be introduced to statistical thinking, definitions, techniques of organizing and describing information, estimating and testing. The student will understand:*	Contact Hours	
• **Why one needs to know about statistics?**	1	1
• **Descriptive vs. Inferential statistics**		
• **Variables, Types of Data & Levels of Measurement**	1	2
• **Frequency Distributions, Relative Frequency & Percentage Distributions with Histograms & Polygons**	1	3
• **Use of Microsoft Excel for Tabular & Graphical Summary**	1	4
• **Measures of Central Tendency**	1	5
• **Measures of Variability & Shapes of Distributions**	2	7
• **The probability Distribution, expected values and deviation**	1	8
• **Binomial Distribution**	2	10
• **Poisson, & Hypergeometric Distributions**	2	12
• **Uniform, Normal, Exponential distributions**	3	15
• **T, F, & Chi-Square distributions**	1	16
• **Central limit theorem**	2	18
• **Confidence Interval for a Mean, Sigma and proportion**	2	20
• **Hypothesis Testing of mean, sigma, & proportions**	3	23
• **Chi Square Goodness of Fit Test**	2	25
• **Test of Independence**	1	26
• **Analysis of Variance**	3	29
• **The development of the Simple Linear Regression Model**	3	32
• **Regression & Correlation with Microsoft Excel**	2	34
• **Design of Experiment concepts**	2	36
• **Design and analysis of experiments**	3	39
• **Full factorial & fractional factorial designs**	2	41
• **Analysis with Microsoft Excel**	1	42

The student will be able to:

- Develop an understanding of basic statistical concepts and be aware of misuse of data
- Summarize data using graphical, tabular and numerical measures of central tendency & dispersion
- Use discrete and continuous statistical distribution for analyzing and solving business problems
- Estimate a parameter with a confidence level

- Calculate margin of error for point estimates
- Perform the appropriate hypothesis test for a mean, sigma & proportion
- Study relationship between two or more variables
- Design full factorial experiments and perform Analysis of Variance test & interpret results from appropriate computer software analysis
- Analyze a case study by organizing the information by utilizing the descriptive measures and probabilities.
- Collect information, describe, test and interpret the results from appropriate computer software.

COURSE MATERIAL

Text:	Business Statistics Ken Black, Wiley, (Sixth edition)
Course Notes:	Available on myCourses website
Calculator	
Statistical Software:	Excel;
myCourses:	**http://dartmouth.umassonline.net/index.cfm**

COURSE POLICY:

This course will be conducted online using myCourses website. Being an online course it is extremely important to meet the deadlines for the assignments. Note that all weekly assignments can be completed anytime, up until 11:59pm each Sunday. Tests and quizzes are to be completed online, however for homework assignment you can send email with a word or excel file attachment. In case you have done homework assignment by hand, you can scan it and send an email with an attachment. For working out some of the statistical problems, we will use Excel software. However, if any students wishes to use any other statistical software such as SPSS, Minitab, or R and has access to it, they can use those software too. If a student finds any topic or concept difficult to understand while using the text and other courses materials provided, they should immediately setup an appointment with the instructor for a meeting by sending an email. In statistical analysis course some of the key concepts are linked to each other and delaying understanding of such concepts can cause difficulty for a smooth progress in the course. Therefore students having any difficulty with quizzes and homework assignment or understanding of key concepts should contact the instructor and setup an appointment to clarify queries.

ONLINE MEETINGS WITH WIMBA LIVE CLASSROOM

The first meeting using the Wimba Live Classroom available at myCourses website will be held on first Monday of semester at 6:30pm. This meeting will be for one and half hours. In this meeting course schedule, evaluation policy, and other course related information will be shared and discussed. The class would meet online once every two weeks and the timing for the meetings will be arrived at with everyone's agreement at the first meeting.

E-PORTFOLIO REQUIREMENT FOE MBA STUDENTS:

All MBA students must develop and maintain an ePortfolio as a requirement of the program (non-degree students and MGT certificate students are exempt from this requirement). ePortfolio accounts should be purchased through the online campus bookstore (http://umdcampusstore.com/MerchList.aspx?ID=6081).

Artifacts from this class that must be uploaded include: (you specify any assignments that are done as doc, xls, ppt, jpg. files that are significant enough to show student learning. Alternatively just put an asterisk next to those assignments on the syllabus). Artifacts must be linked to one or more appropriate learning goals (i.e., problem-solving/analytical thinking, technology/information literacy, written communication, global awareness, ethics, management of a business enterprise). Students must write a short reflection at the beginning of each of the learning goal sections that: 1) states what the learning goal is about, 2) which artifacts (by file name) relate to the learning goal, and 3) a brief description of the artifact . After uploading the artifacts, students must "SHARE" the information with me so I can review it. Students not completing the ePortfolio requirement will receive and incomplete in this course.

Further information on the ePortfolio can be found at:
http://www.umassd.edu/charlton/eportfolio including training locations and times, phone numbers and emails for technical help, and the student user manual.

EVALUATION POLICY:

Tests:

There will be three tests throughout the semester. The schedule for the tests are given along with other details in the last section of this syllabus under 'class schedule' title. The tests will be for a duration of three hours and there will be only one chance for final submission. To help prepare for the three tests, the students will be provided with practice tests one week before the test.

Online Quiz:

There will be online quizzes available on myCourses after for each topic. Before gaining access to the online quizzes, students must complete a non-graded pre-course quiz. The online quizzes are due at the end of the week indicated in the 'class schedule'. The online quizzes will not be available after the due date. There will be three chances to submit an online quiz. The best score out of the three will count towards your final grade. Out of all the online quizzes, score for one lowest quiz will be dropped when finalizing the final grade at the end of the semester.

Homework:

For homework assigned are due at the end of the week indicated in the 'class schedule'. On-time homework submissions will be graded out 100% and those submitted late will be graded only out of 50%. So due to any reason if a student was unable to submit a homework assignment on time, submitting it later can still help to obtain partial credit.

These exam results, online quizzes, and homework scores will determine your grade for the course. Given below is the break-up.

Evaluation Type	Score
Tests (3)	40%
Online quiz on myCourses	30%
Homework Assignments	30%
TOTAL	100%

FINAL GRADES

Final grades would be determined based on all three items discussed above with weightings as indicated. The course contents are designed to help you to be successful in your current or future profession. And therefore to pass this course, a student must develop and demonstrate basic understanding of the statistical concepts, and good comfort level in interpretation and application. Given below are the suggested grade levels based on the final course score:

Grade	*Final Score (%)*
A-, A, A+	90-100
B-, B, B+	80-89
C-, C, C+	70-79
D-, D, D+	60-69
F	00-59

CLASS SCHEDULE*

Day/Date	Topics
Week-1	1. Introduction to course; Data and Statistics; Types of data; Scales of measurement: Nominal, Ordinal, Interval and Ratio; Misuse of Data; **Assignments Due:** Online Quiz-1 Homework-1
Week-2	2. Tabular and Graphical summary of data; Different patterns of a histogram; Use of PivotTable in Excel; Numerical summary of data; Measures of central tendency and variability; **Assignments Due:** Online Quiz-2 Homework-2
Week-3	3. Discrete Distributions: Binomial experiments, Binomial Distribution; Use of Microsoft Excel functions; Simulating Binomial experiments; Poisson Distribution; Hypergeometric Distribution; **Assignments Due:** Online Quiz-3 Homework-3

Week-4	**TEST #1 based on Topics 1 - 3**
Week-5 & 6	4. Continuous Distributions: Uniform, Normal, & Exponential Distribution; T, F, & Chi-square Distributions; Central Limit Theorem; Confidence Intervals for Mean, Sigma, and Proportion. **Assignments Due:** Online Quiz-4 Homework-4
Week-7	5. Introduction to Hypothesis Testing; Hypothesis Testing of Means; Sigma Known and Sigma Unknown Cases; p-Value; **Assignments Due:** Online Quiz-5 Homework-5
Week-8	6. Hypothesis Testing of Variances; Hypothesis Testing of Proportions; Hypothesis Testing – Chi Square; Goodness of Fit Test; Test of Independence; **Assignments Due:** Online Quiz-6 Homework-6
Week-9	**TEST #2 based on Topics 4 - 6**
Week-10 &11	7. Analysis of Variance Calculations and Interpretations; One-way ANOVA; Team Exercises; **Assignments Due:** Online Quiz-7 Homework-7
Week-12	8. Introduction to Design of Experiments (DOE); DOE Terminology; One-Factor-At-a-Time (OFAT) Experiments; Steps in DOE; Full-Factorial & Fractional Factorial Designs; Introduction to Taguchi Designs; Team Exercises; **Assignments Due:** Online Quiz-8 Homework-8
Week-13	9. Simple Linear Regression Model; Least squares method; Sample correlation coefficient; R-square; Regression with Microsoft Excel and interpretation of regression equation & ANOVA output; **Assignments Due:** Online Quiz-9 Homework-9
Week-14	**TEST #3 based on Topics 7 – 9**

*The class schedule is tentative, and is subject to change at the instructor's discretion.