

## **IT 111 MANAGERIAL STATISTICS (already exists as MSIS 111)**

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### **Course Description**

Provides the student with the basic statistical techniques needed for business decision making in areas such as operations management, quality improvement, marketing research, finance, and general management. The course examines collection and presentation of data, frequency distributions, basic probability, statistical inference, and regression. Students use statistical software for data presentation and analysis.

*Prerequisites: MA 129 or MA 130, co-requisite IT 110 or MSIS 110*

### **COURSE MATERIALS:**

#### **(1) Class Textbook:**

**Business Statistics: Contemporary Decision Making, 4th Edition**, by Ken Black. ISBN: 0-471-70563-2

Available from the UMass bookstore in person or on-line ([www.efollett.com](http://www.efollett.com)). If you purchase the book through some other source (which is OK with me) just be sure you get the 4<sup>th</sup> edition.

Another option is to purchase an e-book, which allows you to get the book electronically and at a substantial discount. You can, in fact, download it onto your computer so you have it forever, well as long as some computer somewhere can read it. But you don't get a nice heavy book to carry around in your backpack and read on the train, and the students who chose this option last semester found it hard to navigate. To get the e-book: go to:

<http://edugen.wiley.com/edugen/class/cls24987/>

click on "register" and follow the directions from there. You'll get an opportunity to purchase a registration code, so have your credit card ready.

#### **(2) MS Excel**

You also need to have a computer running Microsoft Excel (any version, either PC or Mac) with the add-ins "Data Analysis Pack" and "Solver". (Both of which come with Excel, but you might have to install them from the original disks if you didn't do so when you set up the computer.)

### **(3) Excel Videos**

Also, I have prepared a number of "Excel Videos", which will help you with Excel tasks necessary for this course. These videos are an integral part of this course, and you **MUST** be able to access them. They are on a CD which you can only get from me. If you're on campus you can come pick up (at my office) and if you're not I'll mail to you.

## **II. PRE-REQUISITES**

MSIS 110: Introduction to Management Information Systems (can be taken concurrently)

Math 129: Pre-Calculus for Management and Social Science

Note: the Statistics requirement for the B.S. in Management can be fulfilled by this course (MSIS 111) OR by Math 125 or Econ 205. It is **NOT** appropriate to take this course after taking either Math 125 or Econ 205 or anything equivalent to these courses.

## **III. COURSE BACKGROUND**

With the wealth of information technology in today's business world, managers are drowning in a sea of data. This course is intended to help you build at least a lifeboat, and perhaps even a seaworthy craft, to help you navigate through that sea. The emphasis in this course is helping managers to choose and use statistical methods to turn data into information, and turn information into decisions that add value to their companies.

The course is designed to be "hands on". Students will use realistic data sets involving real world data. Most of the analysis in this course will be done with Excel, either the functions available in "plain vanilla" Excel or with easily obtainable add-ins.

Examples will be drawn from a variety of functional areas. In particular, modules will be included about the statistical techniques behind business topics in the three functional areas of business, namely accounting/finance, marketing, and operations management.

## **IV. COURSE OBJECTIVES**

This course is intended to:

- introduce the students to the concepts and methods of statistics as applied in various managerial contexts,
- emphasize the integration of data analysis techniques and managerial decision making
- develop students' ability to raise and answer managerial "what if" types of questions
- show students how to employ spreadsheet packages in order to analyze business data
- provide the statistical foundation for understanding key topics found in management courses such as Financial Management, Marketing, and Operations Management.

At the end of this course a student, when confronted by a mass of data should be able to:

- think critically about the "quality" of the data,
- be able to organize, summarize, and describe the data using Excel
- choose and apply the appropriate method for statistical analysis using Excel
- present the results of the analysis in a professional manner
- be able to use the results of the analysis to make managerial decisions

Skill Development: through a series of homework sets, a data analysis project, and quizzes this course will emphasize the development of the following skills:

- critical thinking,
- quantitative analysis and reasoning,
- computer application, and
- written communication.

We will also touch on the themes of ethics and professional demeanor.

## **V. COURSE FORMAT AND STRATEGIES FOR SUCCESS**

This is an on-line class.

It is asynchronous, meaning the material is available 7 days a week, 24 hours a day and there is no specific time when a student has to be in a specific place. However it is instructor paced, meaning that like a regular on-ground class there are weekly lectures, assignments, and discussions. One goal for this course is for this class to form a true "learning community" so you can't go significantly ahead nor can you fall significantly behind.

The class is divided into 15 weeks of material. Weeks start Monday at 12:01 a.m and end the following Sunday at 11:59 p.m. Within the weeks the material is divided into "lessons". Most lessons involve reading the textbook, reading/listening to some powerpoint notes, and then some way for you to show you have mastered the material in

the “lesson” --- either an on-line quiz or some homework problems to hand in. Most weeks will involve 3-5 lessons.

The way to succeed in this (or perhaps any) on-line course is to realize that with the on-line format you are totally responsible for your own learning. A first-year statistics course, nationwide, involves pretty much an established set of material, and your semester-long goal needs to be for you to master this material. You have various resources available to you, including:

- a well-regarded textbook,
- work broken down into manageable “lessons” by your instructor,
- powerpoint notes from the instructor,
- video files from the instructor,
- chances to practice and get feedback on your mastery of the material (assignments)
- a set of classmates to interact with who are traveling the same path
- an instructor willing and able to provide one-on-one help as needed.

However, none of these things do one bit of good if you don’t interact with the course. We have fifteen weeks in the semester, and it takes each and every one of those fifteen weeks if you are going to master what your subsequent instructors (and even employers) are going to expect you know from a first-year statistics course. You **MUST** make a commitment to work on this course, each and every week --- and if you can’t then don’t take it.

So this course isn’t about pleasing the instructor. It isn’t about checking off assignments. It isn’t about racking up credits by squeezing in another course. What it **IS** about is learning statistics. If you start a homework set, and can’t do much of it --- handing in junk isn’t going to do you any good (what did you learn from that?). If you do a homework set that you thought was correct, but it wasn’t close, you **WILL** be expected to redo it after you get help. If that doesn’t sound like you, then wait and take the course on-ground.

Now for a little algebra. Full time (job or student) = 40 hours = 5 courses. That means the nationwide expectation is  $40 \text{ hours} / 5 \text{ courses} = 8 \text{ hours a course}$ . In an on-ground class, that means you’re in class for 3 hours and you can be expected to spend up to 5 hours every week outside of class on preparation and homework. For an on-line class, I absolutely am expecting you to spend up to 8 hours every week on it. The material others would get in class, you have to spend time getting yourself. And *then* you start the homework, which is no more but is no less than is assigned in an on-ground class. **PLEASE THINK** before you start this class if really have time to do it.

## **VI. HONORS GUIDELINES**

In an on-line course your integrity is both of the utmost importance and admittedly a bit hard for the instructor to police. However for exactly that reason, if there is even the hint that the work you are handing in is not your own, expect the matter to be addressed swiftly and harshly. At some point during this semester you are going to be falling behind, and you are going to be tempted to take shortcuts. DON'T! There is ALWAYS another choice --- and consulting with the instructor about how to catch up or to get more explanation of whatever is confusing you is probably the place to start.

Students are expected to follow regulations and procedures regarding Academic Standards, Cheating, Plagiarism, and the Documentation of Written Work as specified in the UMB Student Code of Conduct (available at):

[http://www.management.umb.edu/undergrad/undergrad\\_code\\_of\\_conduct.php](http://www.management.umb.edu/undergrad/undergrad_code_of_conduct.php)

Students caught cheating or plagiarizing will, at the discretion of the instructor, flunk either the assignment in question or the course and will have a description of the incident attached to his or her academic records.

However, one of the goals of this class is to foster a “learning community” where students learn from each other as well as the instructor. Drawing the line between collaboration (which is often allowed and even encouraged in this class) and cheating (which will be dealt with most harshly) can sometimes be difficult for students. The following guidelines should help you. When in doubt, do and protect your own work and check with the instructor before you do anything out of the ordinary. Note that in this class assisting someone with cheating is considered as serious as doing the cheating and will be penalized as harshly.

You may discuss work on homework and memo assignments with others. Students can and should help each other set up problems, get over places where they are stuck, discuss the managerial issues, and check answers with one another. You may be asked to identify others with whom you have worked --- get their names if you don't know them. You may not copy (or allow someone to copy) someone else's work --- even if the second person claims they are only using it to “go by”. This includes copying by hand, Xeroxing, or sharing computer files. Similarly, on short answer type questions, it's fine to discuss the basic issues but each person should write their own response.

You may work alongside someone when working on spreadsheets. You may not just use one spreadsheet for the two of you without previous permission from the instructor.

You may study together for quizzes. However, you may not contact anyone except the instructor for any reason regarding a quiz. Be forewarned, multiple versions of quizzes may be used in this course.

## **VII. ADMINISTRATIVE NOTES**

The instructor in this course has voice-mail and e-mail, and you can also ask for help from the CM Faculty Support center at 617-287-7850. No excuses about not being to get in touch with me will be accepted on any matter. Please note that voice mail and e-mail are time and date stamped.

It is the student's responsibility to keep up with the class. Students are expected to participate fully every week. If a student does not participate for two entire weeks and does not otherwise contact the instructor, s/he will be considered to have dropped the class (by the instructor --- the proper papers still need to be filed at the registrar's office). No you can't "catch up" by doing 2, 3, 4 ... weeks in the next 3 days, and I'm not going to along with such a plan.

Incompletes will be given rarely, and only in circumstances that are acute and could not have been foreseen. Illnesses and unanticipated court/police matters often do qualify for incompletes; getting overwhelmed by an overly ambitious work/course/family schedule does not. Note that UMASS course procedures require that a student have completed the majority of the work in the course (usually at least 2/3) and be passing the course at the time the incomplete is given.

Since you have a week to take the quizzes, there should be no reason for "make-ups". The final quiz will extend into finals week May 21-25.

Students with special needs, working through the Ross Center, will be accommodated. Please inform the instructor of any needed accommodations at the start of the course.

## VIII. METHOD OF EVALUATION

Course elements will be weighted as follows:

Item	Points
Objectives Demonstrated during "Content Weeks" (5 points each week)	60
Quizzes (10 points each)	30
Memo Assignments (5 points each)	10
Total	100

"Content weeks", weeks when new content is presented, will all start with the definition of a set of usually 5 learning objectives. A set of 1 – 5 "Lessons" during the week will present content, and will have assessment activities at the end (either taking a short on-line quiz or doing some homework problems). The grade for the week will be based on how well a student demonstrates that s/he has mastered the learning objectives.

There will be course discussions each week (sometimes several in parallel) and many weeks will have a short "article of the week" to discuss. To fully benefit from this class you must keep up and you must participate in class discussions and other weekly

exercises. Since you can access the internet (and hence this course) from anywhere in the world these days, I accept very few excuses for lack of participation. Go on vacation, take a business trip, go on a honeymoon --- if there's a public library where you're going or an internet café you can keep participating.

Quizzes will involve more recall and application, and less calculation than homework sets. Since I have no control of what you do while you take the quiz, they will be open book and open notes. There will be three quizzes, the last one will be cumulative.

The memo assignments are intended as an integrative experience which will have you apply the statistical techniques you are learning to a realistic managerial experience, and will help to exercise (and it is hoped improve) your writing and critical thinking skills. There will be a total of 2 of these assignments.

## IX: CLASS SCHEDULE

Week	Topic	Chapter
1	Intro to Course, Intro to Statistics, Graphical Display Methods	1, 2
2	Summary Measures	3
3	Analyzing Univariate Data	Notes
4		Quiz 1, Memo 1
5	Event Probability	4
6	Probability Distributions	5
7	Continuous Probability Distributions, Sampling Distributions	6, 7
	SPRING BREAK	
8	Confidence Intervals	8
9		Quiz 2, Memo 2
10	Hypothesis Testing	9
11	Analyzing Multivariate Data	9, framework
12	Two Sample Hypothesis Test, Chi-Square Test of Independence	10, 12
13	Time Series and Simple Linear Regression	11, 13
14	More on Regression	13
15	Wrapping Up	Quiz 3
	Finals Week	