University of Michigan-Dearborn Syllabus

DS 300, Quantitative Modeling and Analysis I, 3 credits

Professor Edward Williams
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Office Hours: just before/after class (Monday through Thursday), Wednesday 3:30-5:50 and by appointment
Course Meeting Times and Format(s): 8:00am – 9:15am MW *or* TR, 192 FCS, or Wednesday 6:00am-8:45pm, 192 FCS.

Course Description:

To introduce fundamental concepts and methods in data analysis, probability, estimation, and statistical inference for application in management and management science. Topics include: basic probability theory, discrete and continuous random variables and distributions, sampling and data analysis, sampling distributions, estimation, confidence intervals and hypothesis testing, introductory regression analysis, and utilization of statistical software packages.

Prerequisites: MATH 104/105/113/115 or MPLS 115, and sophomore standing.

Program Goals:

The BBA Program Goals and Objectives may be found at umdearborn.edu/cob/bba-goals-and-objectives.

This course contributes extensively toward several of these learning objectives, as follows:

1) Understand the applicability of probability and statistics to practical managerial decision-making.
2) Learn fundamentals of probability and statistical models.
3) Learn the usage of computer software (primarily Minitab®) relative to statistical analysis.
4) Develop and use critical thinking skills applicable to quantitative business problems.
5) Practice and develop teamwork skills (homework assignments are to be done in teams).

DS 300 contributes significantly to the following BBA Desired Student Outcomes:
1. Have a basic knowledge of economics, accounting finance, marketing, workforce management and organizational behavior, operations management, information systems, statistics and decision analysis, strategy development and implementation and the legal environment of business.
2. Use critical thinking skills to solve real or hypothetical business problems.

Dearborn Discovery Core Goals:
The Dearborn Discovery Core Goals may be found at http://umdearborn.edu/696973.

Required and Recommended Materials and/or Technology:

Required   Berenson, Mark L., David M. Levine, and Kathryn A. Szabat. 2015. *Basic Business Statistics Concepts and Applications*, 13th edition. Boston, Massachusetts: Pearson Education, Incorporated.

Recommended

Groebner, David F., Patrick W. Shannon, and Phillip C. Fry. 2013. *Business Statistics: A Decision-Making Approach*, 9th edition. Boston, Massachusetts: Pearson Education, Incorporated.

Siegel, Andrew F. 2011. *Practical Business Statistics*, 6th edition. New York, New York: Academic Press.

For availability of these and other materials at the campus bookstore, see their web site.

Excellent instructional applets are available at http://lstat.kuleuven.be/newjava/vestac/.

Course Structure:

For each topic, I will provide a brief lecture on the basic and fundamental concepts of importance. The book contains an abundance of example problems. Rather than work these examples, I will work exercises – with class participation! Therefore, students will have two sets of examples of worked exercises: Those in the textbook chapters, and those exercises worked in class. You will then, in self-selected teams, undertake other textbook exercises. Each examination will be about half closed-book, about half open-book. In the closed-book portion of each test, you will write short paragraph answers to questions concerning basic concepts. *No* closed-book examination question will require you to memorize a formula or undertake complex calculations. In the open-book portion of each test, you will, on the computer, work exercises similar to those discussed in class. First Examination dates will be announced at least 2 weeks in advance for each section. Second Examination dates are available at https://umdearborn.edu/rr_final-fall2016/

Assignment and Grading Distribution:

Evaluation Area	Weight
First Examination	40%
Second Examination	40%
Homework team assignments	15%
Class Participation	5%
	100%

There will be two individual examinations, as specified and described above. They will be based on material covered in the text, in the lecture portion of the class, and in the assigned homework problems – i.e., they cover all aspects of the class. There will be (almost) *absolutely* no make-ups.

Homework Team Submission Policies:

Students will form self-selected teams of 3 or 4 to do all homework assignments. I will then define those teams in Canvas (Canvas calls them "groups"). *One* member of each team will submit the team's work on each assignment as a MS Word® document. This document must present your solutions to the assigned problems in a clear, self-contained fashion, with each problem number clearly shown. If the exercise requires a graph, you will paste the graph into MS Word® and provide an interpretation of it. Your boss at work, having assigned you to undertake a statistical analysis, will have similar expectations!

As an example, suppose problem #8 asks for the mean and standard deviation of a data set.

Inadequate:
3.56   1.02

Adequate:
Problem #8
The mean of the data set is 3.56
The standard deviation of the data set is 1.02

Problems will be graded on a 0-4 scale:
0. Problem not attempted or attempt completely off-base
1. Problem attempted and barely begun
2. Significant flaw in the problem analysis and/or presentation
3. Slight flaw in the problem analysis and/or presentation
4. Problem completely correct and clearly presented

University Attendance Policy:

A student is expected to attend every class and laboratory for which he or she has registered. Each instructor may make known to the student his or her policy with respect to absences in the course. It is the student's responsibility to be aware of this policy. The instructor makes the final decision to excuse or not to excuse an absence. An instructor is entitled to give a failing grade (E) for excessive absences or an Unofficial Drop (UE) for a student who stops attending class at some point during the semester. Since University administrative offices may (and historically have) often asked me to specify "the most recent date Student X came to class," I will pass a sign-in sheet around the class at each class session. Attendance or lack thereof influences the Class Participation portion of your grade evaluation as specified above.

Grading Scale:

94%- 100%	A	80%- 83%	B-	67%-69%	D+
90%- 93%	A-	77%-79%	C+	64%-66%	D
87%- 89%	B+	74%-76%	C	60%-63%	D-
84%- 86%	B	70%-73%	C-		

Grade Grievance:

A student may grieve a final course grade or a grade on an examination, project, thesis or any other graded material required for graduation. This grievance process is intended to provide the student the protection against evaluations which are prejudicial, arbitrary, or capricious.
Examples of grading problems which can be grieved are:
a. Clerical error
b. Prejudicial evaluation
c. Inconsistent or inequitably applied standards of evaluation
There is a presumption that the grades assigned are correct and therefore the student has the burden of proof in the grievance process (i.e. s/he must establish clerical error; capricious or prejudicial evaluation; or inconsistent or inequitably applied standards of evaluation). To start this process, the student should contact the Department Chair or Program Director before the end of the fifth week of classes in the first full term following the term in which the disputed grade was issued.

Tentative Course Outline:

Date	Activity and Content
Week 1	Defining and Collecting Data
Week 2	Organizing and Visualizing Variables
Week 3	Numerical Descriptive Measures
Week 4	Basic Probability
Week 5	Discrete Probability Distributions
Week 6	The Normal Distribution and Other Continuous Distributions
Week 7	**Test #1**
Week 8	Sampling Distributions
Week 9	Fundamentals of Hypothesis Testing: One-Sample Tests
Week 10	Fundamentals of Hypothesis Testing: Two-Sample Tests
Week 11	Simple Linear Regression
Week 12	Introduction to Multiple Regression
Week 13	Review and Recap
Week 14	**Test #2**

Academic Integrity Policy:

The University of Michigan-Dearborn values academic honesty and integrity. Each student has a responsibility to understand, accept, and comply with the University's standards of academic conduct as set forth by the Code of Academic Conduct (http://umdearborn.edu/697817/), as well as policies established by each college. Cheating, collusion, misconduct, fabrication, and plagiarism are considered serious offenses and violations can result in penalties up to and including expulsion from the University. I reserve the right to give a grade of zero on an assignment or test, or a grade of "E" in the course, to a student found guilty of academic conduct according to the established procedures for investigating such accusations.

Disability Statement:

The University will make reasonable accommodations for persons with documented disabilities. Students need to register with Disability Resource Services (DRS) every semester they are enrolled. DRS is located in Counseling & Support Services, 2157 UC (http://www.umd.umich.edu/cs_disability/). To be assured of having services when they are needed, students should register no later than the end of the add/drop deadline of each term. If you have a disability that necessitates an accommodation or adjustment to the academic requirements stated in this syllabus, you must register with DRS as described above and notify your professor.

Safety:

All students are encouraged to program 911 and UM-Dearborn's University Police phone number (313) 593-5333 into personal cell phones. In case of emergency, first dial 911 and then if the situation allows call University Police.

The Emergency Alert Notification (EAN) system is the official process for notifying the campus community for emergency events. All students are strongly encouraged to register in the campus EAN, for communications during an emergency. The following link includes information on registering as well

as safety and emergency procedures information: http://umdearborn.edu/emergencyalert/.

If you hear a fire alarm, class will be immediately suspended, and you must evacuate the building by using the nearest exit. Please proceed outdoors to the assembly area and away from the building. Do not use elevators. It is highly recommended that you do not head to your vehicle or leave campus since it is necessary to account for all persons and to ensure that first responders can access the campus.

If the class is notified of a shelter-in-place requirement for a tornado warning or severe weather warning, your instructor will suspend class and shelter the class in the lowest level of this building away from windows and doors.

If notified of an active threat (shooter) you will Run (get out), Hide (find a safe place to stay) or Fight (with anything available). Your response will be dictated by the specific circumstances of the encounter.

Additional Administrative Information:

Timeliness. If you expect full credit for any assignment, you will have to be prepared to turn it in at (or before) the beginning of the class period on the day it is due. Late work will not be accepted except in cases of severe and externally documented extenuating circumstances, and then only at my discretion. Examples of such circumstances are illness, bereavement, jury duty, witness duty, and business travel. If you have obligations that conflict with assignment due dates, you should make arrangements with the instructor as soon as possible.

Score/Grade Appeals. It is important to recognize that a grade reflects another's judgment of your work. In this sense, all grading is subjective. Of course, any grade you receive is subject to appeal. However, score changes are at the discretion of the instructor and may be up or down based upon a complete review of the work in question. Changing a few points on an assignment rarely makes a difference in the final grade. Time is much better spent discussing and clarifying the content presented in the course.

Electronic Communication Devices in the Classroom. All electronic devices (cellular phones, pagers, etc.) should be turned off or set on "vibrate" prior to the beginning of each class session. Failure to do so will result in a disruption of the class. If such a device rings aloud during a class session, you might (I reserve discretion) lose one full letter grade from your final course grade. If you receive an emergency incoming call via *vibration*, please leave the classroom quietly and unobtrusively to answer it, and return to the classroom likewise. Please do your part to ensure that the class is not interrupted and that you do not lose any points in the course.

Email Accounts and Responsibilities. Each of you has received a UM-Dearborn email account. It is your responsibility to read any and all email messages sent to this account. I will be using your UM-D account and/or Canvas for email communication regarding this course. This does not mean that you cannot have other email accounts – it means you are responsible for any information sent to your UM-D account. This could be accomplished by using this UM-D account on a regular basis (as some students do) or by forwarding all email sent to the UM-D account to another account of your choosing. This forwarding process is very simple.

To forward your email:

1. Go to http://directory.umd.umich.edu and click the My Account button
2. Enter your "uniqname" and click the Continue button
3. Enter your password and click the Continue button
4. Click the Continue button again, if necessary

5. Under the Mail section (on the left-hand side of the screen) click on Delivery Options
6. Enter your other email address in the "Forward a copy of your messages to:" text box
7. Click the Change button

The course Canvas website also contains an email function and an announcement. You are welcome to utilize this for communicating with each other and/or with me. You are responsible for all email sent by me to this internal, course account and to your UM-D account, plus all announcements I make via Canvas.

Incomplete Grades Policy. A grade of Incomplete may be awarded to students who have a legitimate reason for needing additional time to complete a course. Legitimate reasons include emergencies or extenuating circumstances that prevent a student from completing the course requirements within the normal time frame, such as illness, accident, or bereavement. Students must initiate the request for an incomplete prior to the end of the semester. In no case will a grade of incomplete be awarded to someone seeking more time to master the course material in order to improve their grade (this prohibition is university policy, not mine).

Drop and Add. The final day to drop any College of Business course is specified each semester in the Schedule of Classes. This policy applies to all students enrolled in any College of Business course. Check the information contained in the Schedule of Classes or the Undergraduate Announcement for the detailed withdrawal policy if you have any questions.

You are expected to abide by all aspects of the Statement of Student Rights and Code of Conduct in this course. The two basic tenets of this Code are:
1. Students will behave honorably, ethically, and responsibly in all academic matters both inside the classroom and in outside work related to their courses.
2. Students who are aware of academic misconduct in any form will report the violation to the instructor or other school representative. Students who are aware of academic misconduct and who fail to report the violation are themselves guilty of academic misconduct.

It is assumed that you have a copy of and have read and understand this code. Further, you are expected, especially as information systems professionals in training, to respect campus computer resources and to use them productively and wisely.

Travel Plans. Advance purchase of airline tickets, hotel reservations, etc. for holiday or leisure travel is an inadequate excuse to miss examinations or other course deliverables. Travel required for work (business troubleshooting, visiting a business branch or client, or attending a technical conference) when documented by a letter from your boss on corporate letterhead, or travel for documented extenuating circumstances (e.g., a family bereavement) will be considered an extenuating circumstance.

Campus Closure (Severe Weather) Information Line. 1-313-436-9157. In case of a University closure due to weather or other conditions, check your email for announcements and an updated course schedule.