

Course Syllabus - Statistics - Fall 2018

Instructor Information

Instructor Name: Professor Bryan Lilly, Ph.D.

Email: lilly@uwosh.edu *If you email me about an issue that requires discussion, then call me or in your email please include a phone number so I can reach you. Also, once in a while email goes to my SPAM box, so if you email and do not hear back within a day, then call or post a note to the Ask-The-Class discussion area so I know you are trying to reach me.*

Office phone: 920-424-7201

Home phone: 920-237-0416. Please call before 9pm on weekdays, anytime Saturday 9am-9pm, and Sundays noon-6pm. Realize I'm sometimes at home and am sometimes unavailable. Why would you call me? Because often one call is a LOT more productive than a bunch of emails.

Office address: Sage Hall 1449, UW Oshkosh

General Course Description

The Business Statistics course is designed for MBA students who possess little prior exposure to statistics. The purpose of the course is to increase understanding of statistics for business use. The course is a prerequisite to the Operations & Productions Management Foundation course, the MBA Consortium Module-2 course, and a couple electives. This course has no prerequisites of its own.

Course Objectives

The overall objective is to improve your ability to use quantified information in making business decisions. This course specifically works to build proficiency in several areas:

1. Recognize basic statistical concepts, such as what is meant by statistics and making inferences from a sample of data to a population of interest.
2. Work with different types of data, and know how to select an appropriate statistical tool based on the types of data being studied.
3. Conduct and interpret univariate (one variable) statistics, such as frequencies, mean and standard deviation.
4. Conduct and interpret bivariate (two variable) statistics, using crosstabulations, comparison of means, correlations and bivariate regression.
5. Conduct and interpret multivariate (three or more variable) statistics, using regression and R².
6. Report and discuss results from statistical analyses in ways that logically drive implications and recommendations.
7. Recognize how statistics can be used in business decision making, including the limitations of statistics.

Course materials

Main readings

Our course has three main readings. They are tabled below and are posted on D2L. You have the option of purchasing printed copies of these three readings through the UWEC Bookstore. The bookstore package of readings will only include these main readings. If you purchase from the bookstore: a) ask first whether copies will be printed black-and-white only (the digital version includes color for screen shots and some text), and b) you'll still need to read-or-download cases and other notes from D2L. [See the Consortium website for more information.](#)

Read as we start	Reading
Week 1	Excel Basics
Week 2	Statistics Basics
Week 3	Statistics Intermediate

Other files posted on D2L.

- This syllabus. Please review it, ask questions and offer suggestions.
- [Pivot Table.xlsx](#). This is optional. When you reach the Pivot Table section of the Excel Basics reading, you can open this file and follow along if desired.
- [Statistics Cheat Sheet](#). This reference tells you what statistic(s) to use based on the type of data you have, and the analysis objective.
- Weekly data assignments. We'll have an Excel starter assignment during week 1, and then six cases starting week 2. Each data assignment has step-by-step instructions. Cases include an HTML file with case information plus Excel files with data.
- Tutorial videos. You'll have access to multiple videos. These are optional resources. One set of videos provides [Excel "how to" examples](#); they assume you understand how to interpret output and just want to "see" someone get output using Excel. A second set of videos covers [conceptual issues](#). You can find links TO videos in our Content area, and then click on Course Information. A final set of videos accompanies the exam material; videos that show you how to solve practice problems.
- [Course Calendar](#). This file provides all due dates. The pattern of due dates/times is pretty consistent across weeks.

Optional reading material.

The main readings and cases will get most people through the course just fine. Some people find it helpful to have supplemental readings, and I can recommend different books. If you want a book, then confer with me so I can try to recommend something based on your specific needs and interests.

Software

We'll use **Microsoft Office Excel 2016** for data analysis. If you do not own this version of Excel, you may be able to obtain it for free or at a reduced cost through the following sources:

- If you are a UW-Eau Claire or Consortium student (i.e., you have a "@uwec.edu" email), you should [download and install Microsoft Office 2016 for free from Office365](#).
- If you do not have a "@uwec.edu" email: Contact the Helpdesk on your home campus for assistance obtaining Office 2016.

Will prior versions of Excel work well enough? Yes, but you are taking a slight risk. During past semesters, most students using prior versions have told me they did fine with the software, while some students said they upgraded mid-course or wish they had upgraded at the start. The readings have a lot of screen captures and some things look a bit different in Excel 2016 compared to earlier versions. And a couple formulas have changed since Excel 2010.

In addition to the basic Excel software, you'll use the MS Excel Data Analysis Toolpak. The Toolpak is part of Excel but is not always turned "on" during a normal software installation. Your Data Analysis Toolpak might already be turned "on" or you might need to turn it on yourself. You'll see some instructions for this during the course and Microsoft's website offers [documentation for loading the Toolpak add-in](#).

Mac users. CAUTION: Mac was NOT originally designed for statistical analysis. You can probably get by using the current version of Mac, but I don't recommend it. Class members during prior semesters have told me Mac can be used, but it's more of a pain than they anticipate and they wish they used Windows. Also, class members can call me and ask "Bryan, how to you do ____ in Excel" and I can help people who use the PC version. If you use a Mac and want technical help, then email BIZD2LHelp@uwec.edu with your questions (send conceptual-related questions to me; help-desk folks can assist with Mac technical questions). Finally, with a Mac you may need to install StatPlus:mac LE. The add-in download and documentation are available on the [AnalystSoft website](#). This is the Mac equivalent of the Data Analysis Toolpak noted above. **Note:** The StatPlus menu integration with Excel is not available for Excel 2016. Adding the StatPlus menu to the Excel main menu works only for the 2004 and 2011 Mac versions of Excel. If you have Excel 2016 for Mac you will have to launch the StatPlus application and conduct your analyses there.

Student Expectations and Course Format

D2L mechanics

Please access the D2L course-site a few times per week. Look for 'news' updates about three times/week. New 'news' items are typically posted each Monday morning, then Friday morning, and then Saturday with an example solution file to the weekly case. During exam weeks (weeks four and seven), the pre-weekend news is posted on Thursday mornings instead of Friday mornings, so you can see the news before the exam opens on Friday.

When posting comments to D2L, be succinct and view quality as more important than quantity. And after uploading files to D2L, please check files to make sure you uploaded the right file, and that it can be opened (occasionally the wrong file is uploaded or gets corrupted; so please check your upload).

Assignments

Work through an Excel Starter assignment, six Cases (once/week starting week 2), plus six Conceptual Discussion Challenges (once/week starting week 2). Details on these assignments:

- The week-1 Excel Starter assignment is a 'ramp up' for people who have never used Excel. This should be pretty easy and will familiarize you with some formatting requirements you'll face on other submissions.
- Each weekly case (starting in week 2) involves TWO submissions. The first submission is just the Excel analysis and should be completed individually, and submitted to Dropbox every Saturday by 8am. Step-by-step guidance is provided for analyses. Then look at Excel solutions, which will be available in the course 'News' section soon after the analysis submission deadline passes. Solutions let you check your Excel work BEFORE moving to the second submission, which is a conceptual write-up that answers some business questions based on the analysis results. As you answer questions, make sure to present and discuss key analysis results. This second submission is a conceptual write-up due every Sunday at 3pm and may be completed individually or with a partner. You may submit conceptual write-ups with different partners across cases, or sometimes with a partner and sometimes individually. A discussion area exists for posting messages to find a partner for the Sunday write-ups; use that if helpful. **Make sure to upload Excel first-submissions on time; scores of zero are applied to submissions uploaded after solutions are posted.** Checking solutions posted in the News area is strongly encouraged. For each case, you may submit your second submission (the conceptual write-up) without checking Excel solutions, but conceptual submissions will be scored assuming you have completed the analysis portion correctly. So if you did something wrong in your Excel analysis and choose to work on your conceptual write-up without checking posted solutions, then you can get a low score for both the analysis and conceptual parts.
- Each Conceptual Discussion Challenge (starting in week 2) presents a "Question of the Week" problem and guides you to think about core concepts and materials that will be covered on exams.

Exams

We have two exams; one during week 4 and one during week 7. Each exam is 90 minutes and has three parts. The first part is conceptual, with about 15 multiple choice questions that reflect concepts discussed in the readings and through assignments. The second part is applied and involves reading output. In this second part you'll be given some output and you'll make interpretations. The third part is applied and involves conducting statistics. In this third part you'll get a data set and some questions. You'll have access to the data and questions before you start the 'timed' portion of the exam. Then you can copy/paste your solutions into the exam for this third part, and append your Excel analysis file.

Asking questions

When you have general questions, please post them on the [Ask the Class](#) discussion area in D2L so others can see the questions/answers. For questions you don't want shared among others, pose them to me via email or phone. Also, with respect to questions you may have on homework, it's fine to ask your question in our [Ask the Class](#) area if your question pertains to a quick technical detail, but most homework is to be done individually, or in pairs for the write-ups, so please do not post substantive homework questions to this discussion area, where the discussion would run against the notion of working on homework individually (or in pairs for the write-up).

Other comments

Please just address me as Bryan, both via email and if you call me on the phone (I'm very informal). Try to pace yourself. Learning statistics is NOT like riding a bicycle. When you learn to ride a bicycle, once you 'get it' you are good for life. With statistics, people gradually get better, and typically as a function of repetition. Assignments will give you some repetition.

Instructor Expectations

- Develop course materials as needed.
- Keep D2L content current.
- Post 'news' toward the start of each week, before moving into the weekend, and post case solutions promptly. The goal is to have a presence through D2L, and post news items in a regular fashion so class members know what to expect and don't feel like they must check D2L constantly.
- Promptly answer questions sent my way.
- Stay on top of grading.

Grading

Graded course components include:

Points	Course component	Who does the work
2	First week Excel Starter assignment.	Individual
24	Six weekly cases starting week 2. Each case has two deliverables; 2 points for an Excel submission plus 2 points for a conceptual write-up.	Individual case analysis (Excel) Individual OR two-person submissions for case questions (Word)
6	Conceptual Question of the Week discussion posts. Six discussion questions are posed in modules, once/week starting week 2.	Group discussion and all individuals should contribute. Initial individual posts are due each Tuesday by 9pm Central time.
15	Midterm exam.	Individual
15	Final exam.	Individual

At the end of the semester the total points will be converted to a percent raw score (out of 62) and then compared to the table below:

Percent	Consortium	Eau Claire	La Crosse	Oshkosh	Parkside	GPA
93.33	A	A	A	A	A	4.0
90	A-	A-		A-	A-	3.67
90			AB			3.5
86.67	B+	B+		B+	B+	3.33
83.33	B	B	B	B	B	3.0
80	B-	B-		B-	B-	2.67
80			BC			2.5
76.67	C+	C+		C+	C+	2.33
73.33	C	C	C	C	C	2.0
70	C-	C-			C-	1.67
66.67	D+	D+				1.33
63.33	D	D	D			1.0
60	D-	D-				0.67
<60	F	F	F	F	F	0.0

Based on the table above, each student's **preliminary** letter grade is determined by finding the row that specifies the number of points a student has scored, and the column where the student is domiciled. For example, a score of 91.3 would equate to an A- or AB. Rounding will not be applied; for example a score of 89.9 will equate to a score of B+ or B, whereas a score of 90.1 will equate to a score of A- or A.

After preliminary letter grades are determined, a mean GPA will be calculated, based on GPAs found in the rightmost column of the table above.

If the mean GPA is lower than a 3.5, and if the overall class performance seems reasonable, then a curve may be applied by multiplying raw scores by a constant, and increasing this constant potentially until the mean GPA reaches 3.5. One caveat to the curve is that each school specifies a performance level that results in retaking the course. Curving of raw scores below those levels is not automatic and will be done on a case-by-case basis.

Late work policy

Specific deadlines exist, per the [Course Calendar](#). For weekly Excel case submissions, right after the submission deadline occurs, solutions are posted in the course 'news' area so you can check your work before developing your conceptual write-up. If Excel work is submitted late, a score of zero will be posted because solutions are available. For all course deliverables, please just submit on time, and contact me proactively if you run into problems. For weekly Conceptual Discussion Challenges (starting week 2), an initial individual post is due, and to earn points on the weekly challenge your initial individual post must be made on time (so you don't hold up the group). Depending on the situation, other submissions made after a deadline may get graded without penalty, may get a partial penalty, or may result in a zero score.

Individual Work, Group Work and academic honesty

Toward the start of the semester you'll be assigned to a group for weekly conceptual discussion posts. Here's what you do as a group versus individually:

- Week 1 Excel Starter assignment is individual work.
- Weekly Excel cases each involve two submissions: Excel work and then a conceptual write-up. The Excel submission is an individual assignment. For the conceptual write-up you may submit individually OR with one other class member. If you submit the conceptual write-up as a two-person team, then just one person should submit the write-up to the Dropbox, and the top of the submission should state names of both authors. Your partner can be anyone in the class and can vary week to week (you may submit individually some weeks and with a partner other weeks).
- Conceptual Question of the Week discussion posts will be evaluated as a score for your assigned group. These discussion posts should attempt to answer questions posed in each weekly module. All group members will get the same score provided: 1) they all post an individual idea on time (as specified in the calendar), plus 2) they contribute at least something to the ongoing solution discussion. You don't need to post tons of times, but at least contribute an individual idea to get the group started, and at least post something as the solution discussion continues, even if just to say you agree with other people in your group (otherwise they will wonder whether you agree with the solution).
- Exams are individual.

Complete weekly Excel work and midterm and final exams individually. Please do not get help from others; this would be viewed as cheating and could result in failing the course.

A few tips/suggestions related to grades

1. Due dates for deliverables and posts are similar across weeks! Just check the pattern of deliverables and get into a rhythm.
2. For weekly cases, shortly after each Excel case submission deadline passes, you'll see one or two sample solutions in the course News area. These will be good submissions and you can check your work against them. If your Excel solution is not uploaded when solutions are posted, then you'll get a score of zero; I do not want to accept solutions after samples have been posted. So please make sure to submit on time.
3. Also for the weekly cases, conceptual write-ups should be uploaded AFTER Excel work is due. If you wish, you can submit your Excel work, look at feedback that will be left in the Dropbox, review one of the sample solutions, and then develop your conceptual write-up. This will let you have 'correct' Excel solutions which you can then draw from as you develop your conceptual submission. Case write-ups should include some analysis results, so it's hard to nail the conceptual write-up if you work from flawed Excel work and if you ignore feedback.
4. A large part of how submissions are scored is their appearance, and you'll see some submission tips/guidelines in the Excel Basics reading. You might have brilliant ideas, but if you fail to convey them in an appealing way, you might as well not have the ideas. Just follow the formatting tips and look at the strong submissions. This is a statistics class but is moreover a business class, so it's important to get good answers and convey them effectively.

5. Starting week-2 we will have a Conceptual Question of the Week. You will post thoughts to your group discussion area. Your initial post is due each week at Tuesday 9pm Central time. If you do not post by then, you risk losing points because you are slowing down your group. Further, after the initial post deadline, I typically review posts and sometimes provide a hint. When I provide a hint to a group after the initial post deadline has passed, I set the score to zero for anyone who missed the individual deadline. My rationale is that it does not make sense to get points after a hint has been given, if you did not contribute to the thoughts that triggered the hint. Please just post on time :)

What you won't learn in this course

Confession time. We must pick and choose what to cover in an introductory course. We have at least two main ways to approach curriculum for a business statistics course.

- Mainly theory, focusing on probability distributions (such as binomial, Poisson and normal), and theorems such as the Central Limit Theory.
- Mainly application, focusing on using actual data (e.g., spreadsheets with numbers), and on tying data results to business problems that motivated their use.

This course is designed using the 'mainly application' approach above. I'm not sure either approach is good or bad; they are just different.

If your goal is to become a statistician, then theory becomes more important. Also, a statistician learns through taking multiple statistics courses, and I think you can learn the theory just fine after starting with an application orientation.

If your goal is to learn about using statistics in business problems, or just in knowing how and when they should be used, then the theory is interesting but will rarely matter in a practical way. As an analogy, I can operate a microwave, vacuum cleaner and TV set just fine, even though I don't know their underlying mechanics. If you want to learn more about statistics theory, then just let me know; I can point you to other readings or more theoretically oriented courses.

Instructor Biography

Instructor Contact Information

Instructor Name: Professor Bryan Lilly

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About Bryan

Greetings!

I hope you enjoy the course and working with me. I've taught this class several times and I developed all the readings and cases we'll use during the class.

Feel free to contact me anytime. Post questions to the Ask the Class discussion area for questions that other students might also have; anything that relates to course content/format/deliverables. If you have other types of questions you can reach me via lilly@uwosh.edu, 920-424-7201 (work) or 920-237-0416 (home). Calling me at home during evenings/weekends is fine, and please call before 9pm.

My business background is cross-functional; I worked in industry for about eight years at two companies before going back for my Ph.D. My experiences spanned operations, quality control, purchasing, sales/marketing and general management. Outside my academic role I work as a consultant for a small LLC company. We specialize in developing marketing strategies based on Voice-of-Customer market research.

Some personal information: I enjoy cooking pizzas and some breakfast items. I play chess and bridge competitively. I'm an amateur carpenter and still have all fingers intact. I've been married for 30 years and have two children; one adult and one in college.



Course Calendar - Fall 2018

NOTES:

1) ALL TIMES BELOW ARE CENTRAL TIME ZONE.

2) SOME ITEMS BELOW **DO NOT HAVE GRADED POINTS**. THESE ITEMS ARE ESSENTIALLY OPTIONAL, AND "DUE DATES" REFLECT SUGGESTED DATES/TIMES FOR COMPLETING THEM.

3) FOR ITEMS THAT **DO HAVE GRADED POINTS**, PLEASE MAKE SURE TO SUBMIT WORK ON TIME. FOR MISSING WORK, SCORES ARE OFTEN SET TO ZERO RIGHT AFTER THE DUE-DATE-DEADLINE PASSES.

Week 1: Sept 10 - Sept 16

Deliverable	Due Date	Points
Read the following files from Content: -Syllabus -Calendar -Weekly Case Assignment Overview -Video Tutorial Overview	Read by: Tuesday @ 8pm	
Read the Week 1 Overview Complete the assigned readings Watch Video Tutorials as helpful	Read by: Tuesday @ 8pm	
Introduce yourself in the "Introductions" discussion area, and respond to other posts as desired	Post by: Saturday morning @ 8am	
Complete the Week 1 Excel Starter assignment	Submit Excel file to Dropbox by: Saturday morning @ 8am	2 pts

Week 2: Sept 17 - Sept 23

Activity	Due Date	Points
Read the Week 2 Overview Complete the assigned readings Watch Video Tutorials as helpful	Read by: Tuesday @ 8pm	
Participate in the Week 2 Conceptual Question Discussion NOTE: Only one group member needs to submit the group summary to Dropbox.	Post individual answer to group discussion area by: Tuesday @ 8pm Submit group summary to Group Dropbox by: Sunday @ 3pm	1 pt
Complete the Week 2 Case Assignment -Complete Case Analysis solo (Excel)	Submit Excel file to Dropbox by: Saturday morning @ 8am	2 pts
-Complete Case Questions solo or in a twosome (Word)	Submit Word file to Dropbox by: Sunday @ 3pm	2 pts

Week 3: Sept 24 - Sept 30

Activity	Due Date	Points
Read the Week 3 Overview Complete the assigned readings Watch Video Tutorials as helpful	Read by: Tuesday @ 8pm	
Participate in the Week 3 Conceptual Question Discussion	Post individual answer to group discussion area by: Tuesday @ 8pm	1 pt

	Submit group summary to Group Dropbox by: Sunday @ 3pm	
Complete the Week 3 Case Assignment -Complete Case Analysis solo (Excel)	Submit Excel file to Dropbox by: Saturday morning @ 8am	2 pts
-Complete Case Questions solo or in a twosome (Word)	Submit Word file to Dropbox by: Sunday @ 3pm	2 pts

Week 4: Oct 1 - Oct 7

Activity	Due Date	Points
Read the Week 4 Overview Watch Video Tutorials as helpful	Read by: Tuesday @ 8pm	
Start studying for the Midterm Exam Review the Midterm Exam Information		
<i>Optional:</i> Work on Midterm Practice Exam		
Participate in the Week 4 Conceptual Question Discussion	Post individual answer to group discussion area by: Tuesday @ 8pm Submit group summary to Group Dropbox by: Sunday @ 3pm	1 pt
Complete the Week 4 Case Assignment -Complete Case Analysis solo (Excel)	Submit Excel file to Dropbox by: Saturday morning @ 8am	2 pts
-Complete Case Questions solo or in a twosome (Word)	Submit Word file to Dropbox by: Sunday @ 3pm	2 pts
Midterm Exam	Available on: Friday morning @ 8am Complete by: Sunday @ 11pm	15 pts

Week 5: Oct 8 - Oct 14

Activity	Due Date	Points
Read the Week 5 Overview Watch Video Tutorials as helpful	Read by: Tuesday @ 8pm	
Participate in the Week 5 Conceptual Question Discussion	Post individual answer to group discussion area by: Tuesday @ 8pm Submit group summary to Group Dropbox by: Sunday @ 3pm	1 pt
Complete the Week 5 Case Assignment -Complete Case Analysis solo (Excel)	Submit Excel file to Dropbox by: Saturday morning @ 8am	2 pts
-Complete Case Questions solo or in a twosome (Word)	Submit Word file to Dropbox by: Sunday @ 3pm	2 pts

Week 6: Oct 15 - Oct 21

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Activity	Due Date	Points
Read the Week 6 Overview Watch Video Tutorials as helpful	Read by: Tuesday @ 8pm	
Participate in the Week 6 Conceptual Question Discussion	Post individual answer to group discussion area by: Tuesday @ 8pm Submit group summary to Group Dropbox by: Sunday @ 3pm	1 pt
Complete the Week 6 Case Assignments -Complete Case Analysis solo (Excel)	Submit Excel file to Dropbox by: Saturday morning @ 8am	2 pts
-Complete Case Questions solo or in a twosome (Word)	Submit Word file to Dropbox by: Sunday @ 3pm	2 pts

Week 7: Oct 22 - Oct 28

NOTE: The MBA Consortium semester calendar indicates classes end Friday, October 26th. You are welcome to turn in everything by the end of the 26th. Deadlines below extend through the weekend and are intended to be helpful. See post on October 22nd to course "News area" with added notes for class members who wish to submit everything by the end of October 26th.

Activity	Due Date	Points
Read the Week 7 Overview Watch Video Tutorials as helpful	Read by: Tuesday @ 8pm	
Start studying for the Final Exam Review the Final Exam Information		
<i>Optional:</i> Work on Final Practice Exam		
Participate in the Week 7 Conceptual Question Discussion	Post individual answer to group discussion area by: Tuesday @ 8pm Submit group summary to Group Dropbox by: Sunday @ 3pm	1 pt
Complete the Week 7 Case Assignment -Complete Case Analysis solo (Excel)	Submit Excel file to Dropbox by: Saturday morning @ 8am	2 pts
-Complete Case Questions solo or in a twosome (Word)	Submit Word file to Dropbox by: Sunday @ 3pm	2 pts
Final Exam	Available on: Friday morning @ 8am Complete by: Sunday @ 11pm	15 pts
Complete course evaluation	Complete by: Consortium staff will advise; often this is Sunday @ 11pm, but check information from our staff.	