

# STAT 1100: Statistics and Probability for Business Management

## Spring 2018

**Instructor:** Bryan Nelson  
**Office:** 1810 Posvar Hall  
**Mailbox:** 1800 Posvar Hall (Just inside entrance to Statistics Department on left)  
**Email:** btn7@pitt.edu  
**Website:** www.bryantnelson.com  
**Cell Phone:** 412-680-0248 (for emergencies only)  
**Office Hours:** Monday 12:00 PM – 1:00 PM in 1810 Posvar Hall  
Thursday 10:00 AM – 12:00 PM in 1810 Posvar Hall  
**Class Hours:** Monday, Wednesday, and Friday  
Either 10:00 AM – 10:50 AM, 11:00 AM – 11:50 AM, or 2:00 PM – 2:50 PM  
**Room:** 104 Lawrence Hall  
**Textbook:** Keller, Gerald. *Statistics for Management and Economics*, 10<sup>th</sup> ed., 2015.  
(I recommend buying the 8<sup>th</sup> or 9<sup>th</sup> edition, which is nearly identical to and costs less than the 10<sup>th</sup> edition.)  
**Prerequisite:** MATH 0120: Business Calculus or MATH 0220: Analytic Geometry and Calculus 1

### Description

This class is a one semester introduction to probability and statistics intended primarily for undergraduate business administration majors and for joint Arts and Sciences/Business majors. You should expect to gain a thorough understanding of four main topics: data collection, descriptive statistics, probability, and inferential statistics. You will also learn to use Microsoft Excel to display and analyze data.

### Grading

#### I. Ten Homework Assignments (296 points)

- There will be **ten (10)** homework assignments throughout the semester that total **296** points. Each part to every question is worth **one (1)** point, but you may receive partial credit for showing your work on many problems.
- Homework assignments and any necessary data are posted on CourseWeb.
- Homework is to be turned in either **during class** or in your **TA's mailbox** by **3:00 PM** on the due date.
- Solutions to all homework assignments will be available on CourseWeb on **Monday morning at 9:00 AM**.
- Your TA will grade your homework, post your score on CourseWeb, and return it in recitation the following week.
- Any grade appeals must be made within one week of the assignment being returned in recitation. **It is your responsibility to check CourseWeb to ensure that your grade has been entered correctly.**
- **No late homework assignments will be accepted.**
- Extended excused absences due to illness, family emergencies, etc. will be handled on a case-by-case basis and may be subject to a departure from the above policy.

#### II. Twelve Quizzes (224 points)

- There will be **twelve (12)** quizzes given throughout the semester that you will take on CourseWeb. Each question is worth **two (2)** points. Although questions are multiple choice, you can still earn partial credit on most.
- Quizzes will be open notes. Outside assistance is not permitted from either your TA, me, or other students.
- There will be **no makeup quizzes** for any reason.
- Solutions to the quizzes will become available immediately after the quiz is due. **Instructions for reviewing your answers and the correct answers are posted on CourseWeb.**
- Due dates are listed on the course calendar. Quizzes must be submitted by **11:59 PM**.

#### III. Three Midterm Exams (450 points, 150 points each)

- There will be **three (3)** midterm exams given on the following dates.
  - Exam #1: Wednesday, February 7 (Lectures 1-8)
  - Exam #2: Wednesday, February 28 (Lectures 9-16)
  - Exam #3: Wednesday, March 28 (Lectures 17-23)
- A calculator will be required to complete some problems on each exam.
- For each exam, you may use any notes you can fit on the front and back of **one sheet of 8½" x 11" paper**. Formula sheets must be **handwritten**. The exams are **closed book** and **closed notes**.
- If you miss an exam due to a university related activity, illness, family emergency, or court appearance, you may schedule a time to make up the exam during either my office hours or your TA's office hours. The exam must be made up within one week of the date of the exam. **Appropriate documentation for your absence is required.**
  - If you cannot provide documentation, you will receive a score of zero.

#### IV. Final Exam (300 points)

- The final exam will be given according to the final exam schedule set by the university during finals week.
  - **10 AM Class:** Thursday, April 26 from 8:00 AM to 9:50 AM
  - **11 AM Class:** Saturday, April 28 from 8:00 AM to 9:50 AM
  - **2 PM Class:** Friday, April 27 from 8:00 AM to 9:50 AM
- The final exam will be **comprehensive**. A majority of the points will come from **Lectures 24-33**. The remainder of the final will focus on material covered from **Lectures 1-23**.
- You may use whatever notes you can fit on the front and back of **two** sheets of 8½" x 11" paper. As before, formula sheets must be handwritten. The final exam is **closed book** and **closed notes**.
- **Per department rules, the final exam must be taken during the scheduled time for your class.** Exceptions will only be granted to students who have three exams scheduled for the same day, university related events, or another exam scheduled at the same time as this exam. If you have a conflict due to one of the above three factors, please contact me ASAP so we can make arrangements for you to take the exam with one of my other two classes.

#### V. Clicker Questions (30 points)

- There will be **216** clicker questions given throughout the semester
- Each question is worth up to **two (2)** points.
- If you answer the question, you will earn one point. If you answer correctly, you will earn the second point.
- The number of points will be determined by dividing the total number of points you earn throughout the semester by **432** and multiplying by 30.
- Clicker questions will be answered using Poll Everywhere. **(See the end of the syllabus for information about Poll Everywhere and instructions on how to set up your account.)**

#### VI. Recitation (20 points)

- There will be **thirteen (13)** recitations throughout the semester. For each recitation you attend, you will earn **two (2)** points up to a total of **twenty (20)** points. You can miss three recitations and still earn all of the points.
- You must be in attendance for the entire recitation in order to get credit for attending.
- Your TA will take attendance, keep track throughout the semester, and post the points at the end of the semester.

#### Alternate Grading Scheme

Most students benefit from weekly homework both in terms of understanding the material and from earning a boost in their grades. However, if you request **via your University of Pittsburgh issued email address by Friday, January 19, 2018**, I will calculate your final grade using only the quizzes, the three midterms and the final exam. Under this grading scheme, the quizzes will be scaled to total **290** points, the midterm exams will be scaled to be worth **200** points each, and the final exam will be scaled to be worth **400** points. You may still earn up to **30** points in extra credit from the clicker questions for a possible total of **1320**. If you choose this option, you may not revert back to the original grading scheme. You will receive a confirmatory email from me regarding your request.

#### Final Course Grade

Although the number of points above totals **1320**, your final course grade will be taken out of **1270** points. The tables below present the number of points you must earn to attain each grade. There will be no rounding of grades to the nearest percent.

Points Earned	Percentage	Letter Grade
1181 and up	93% and up	A/A+
1143 - 1180.99	90% - 92.99%	A-
1104 - 1142.99	87% - 89.99%	B+
1054 - 1103.99	83% - 86.99%	B
1016 - 1053.99	80% - 82.99%	B-
977 - 1015.99	77% - 79.99%	C+

Points Earned	Percentage	Letter Grade
927 - 976.99	73% - 76.99%	C
889 - 926.99	70% - 72.99%	C-
850 - 888.99	67% - 69.99%	D+
800 - 849.99	63% - 66.99%	D
762 - 799.99	60% - 62.99%	D-
Less than 762	Under 60%	F

Do not lobby for your grade at the end of the semester. Grades are not negotiable. Please do not email me if you are unhappy with your final grade after they have been posted unless you suspect a mistake has been made in the calculation of your grade. You have plenty of opportunities to display your mastery of the topics throughout the semester. By taking your score out of 1270 points instead of 1320, I am literally handing you an additional 4% for free. In order to be fair to all students, I will adhere to the above grading scale.

I will occasionally have students come to me towards the end of the semester (and even after the final exam), informing me that they need a certain grade to graduate, continue in their program, maintain a scholarship, etc. I will not consider these requests. If you are seriously concerned about attaining the grade you need, the time to approach me is before April. **If you want or need help understanding the material, come talk to me or your TA long before the end of the semester.**

## Lectures

The lecture slides are posted both on CourseWeb and on my personal website ([www.bryantnelson.com](http://www.bryantnelson.com)) as PDF files with four slides per page. Each set of lecture notes features several examples displaying the day's concepts. All examples are left blank for you to fill in as we progress through the lecture. Feel free to print these out before class, take notes on your laptop, or use whatever method works best for you.

While attending class does not play a direct role in your grade, you can earn points through the clicker questions. You are responsible for all material that is covered in each class. If you miss a class, it is your responsibility to find out from your classmates what you missed and get the solutions to the examples. I do not post the solutions to the examples on CourseWeb because that would partially defeat the purpose of coming to class.

## CourseWeb

All materials you will need for the course will be posted on CourseWeb. The sections include:

- General Information → Consists of course announcements, lecturer and TA information, the syllabus, and your grades.
- Lecture Materials → Slides for each lecture are posted in this section as well as tables that will be used periodically throughout the semester. Also, references that may assist you in using Excel are posted here.
- Assessments → Take your weekly online quizzes in this section. Exam review materials will be posted in this section as well as the solutions to the exams after they have been returned.
- Homework → Weekly assignments, answer sheets, any necessary data, and solutions are posted in this section.
- Recitation Materials → Your TA will have their own section to post any materials you will use in recitation.

## TA Information

Each of you has a teaching assistant (TA) who will lead recitations, grade and return your homework, and hold office hours. There are four TA's who are assigned to my three classes this semester. Their information is in the table below:

<u>Name</u>	<u>Email</u>	<u>Office Hours</u>	<u>Office Hours Location</u>
Tyler Folta	tmf45@pitt.edu	TBA	TBA
Carly Izydore	cmi11@pitt.edu	TBA	TBA
Sean Whaley	smw100@pitt.edu	TBA	TBA
Wuxin Yang	wuy1@pitt.edu	TBA	TBA

Because there is the possibility that your TA's office hours may not align well with your schedule, you are permitted to attend the office hours of any of the four TAs.

## Recitations

During recitation, your TA will review material from the past week and pose additional problems. You will also have the opportunity to ask questions regarding the homework. Recitations will also serve as review sessions for the midterms and final exam. Please make every attempt to attend the recitation for which you are registered. If there is an occasion when you would like to or need to attend another recitation, please notify your TA ahead of time and make sure this is not a problem.

### 10:00 AM

<u>Day</u>	<u>Time</u>	<u>Room</u>	<u>TA</u>
Tuesday	10:00 AM – 10:50 AM	3415 Posvar Hall	Sean Whaley
Tuesday	2:00 PM – 2:50 PM	231 Lawrence Hall	Wuxin Yang
Tuesday	3:00 PM – 3:50 PM	231 Lawrence Hall	Sean Whaley
Tuesday	4:00 PM – 4:50 PM	G21 Cathedral of Learning	Sean Whaley

### 11:00 AM

<u>Day</u>	<u>Time</u>	<u>Room</u>	<u>TA</u>
Wednesday	3:00 PM – 3:50 PM	231 Lawrence Hall	Carly Izydore
Wednesday	4:00 PM – 4:50 PM	231 Lawrence Hall	Carly Izydore
Wednesday	5:00 PM – 5:50 PM	231 Lawrence Hall	Carly Izydore
Thursday	12:00 PM – 12:50 PM	232 Lawrence Hall	Wuxin Yang

### 2:00 PM

<u>Day</u>	<u>Time</u>	<u>Room</u>	<u>TA</u>
Thursday	3:00 PM – 3:50 PM	233 Lawrence Hall	Wuxin Yang
Friday	10:00 AM – 10:50 AM	231 Lawrence Hall	Tyler Folta
Friday	11:00 AM – 11:50 AM	231 Lawrence Hall	Tyler Folta
Friday	12:00 PM – 12:50 PM	231 Lawrence Hall	Tyler Folta

### **Statistics Lab**

The statistics lab is located in 1201 Posvar Hall. The statistics lab is for use by students in all introductory statistics classes, which includes STAT 1100. The statistics lab is staffed by both graduate teaching assistants as well as undergraduate students. You may go to the statistics lab to work on homework assignments during any of the times when it is both staffed to work and not already reserved by another instructor. The students working in the lab are also available to provide help on assignments and answer questions regarding Excel if you are not able to come to any office hours. Occasionally your recitation may meet in the statistics lab in 1201 Posvar Hall. Your TA will provide you with more information regarding meeting in this statistics lab and will notify you if and when you are to report to this room for recitation.

The schedule for the statistics lab can be found at <http://www.stat.pitt.edu/resources/statistics-computing-lab>.

### **Academic Integrity**

Students in this course are expected to comply with the University of Pittsburgh's Academic Integrity policy, which can be found at <http://www.as.pitt.edu//fac/policies/academic-integrity>. Any student found deliberately copying another student's homework assignment will receive a zero for that assignment. Any student allowing another student to copy his/her homework will also receive a zero for the assignment. Any student found cheating on an exam or assisting others in cheating on an exam will receive an **F** for the course and may be subject to further disciplinary action. Generally speaking, it is expected that you do not lie, cheat, or steal in your academic endeavors.

### **Disabilities**

Students with documented disabilities are entitled to reasonable accommodations if necessary. If you have a disability that requires special accommodations, please contact Disability Resources and Services in 140 William Pitt Union no later than the second week of the semester. Their website is <http://www.dr.s.pitt.edu/> and their phone number is 412-648-7890. Accommodations will not be granted retrospectively. They will verify your disability and determine reasonable accommodations for this course.

### **Poll Everywhere**

Poll Everywhere is an online polling service that allows respondents to answer questions on their laptops, tablets, smartphones, or by texting the answer. The Department of Statistics paid for my license so this service is free for you to use. With the Poll Everywhere account, you will have access to all of the clicker questions that you answer in class for you to review. However, in order for this to work, you must set up an account and link it to my class using the following instructions:

1. Go to polleverywhere.com and click "Sign Up".
2. Click on the "You're participating" option on the left.
3. Enter your first name, last name, **Pitt email address**, and password to create your Poll Everywhere account.
4. Poll Everywhere should send you an email within a couple of minutes. Go to your email and click the button to confirm your account.
5. Back in Poll Everywhere, click on the "Participant Registration" link on the left. (If you left the site earlier, click on the gear in the top right and click "Settings" to bring up the menu with "Participant Registration" on the left.)
6. Enter my email address ([btn7@pitt.edu](mailto:btn7@pitt.edu)) and click confirm to add yourself to the course. You should see my name under "You've registered with these presenters."
7. Next to where you see my name under "You've registered with these presenters", click on the "Details" link.
8. Enter your first name and last name in the first box that asks "How should you be identified by Bryan Nelson's account?" and click "Update". This will allow me to associate your responses with you so I can give you points.
9. Enter your cell phone number in the second box and click "Update". This will allow you to text your answers to the questions.
10. If you intend to respond by texting, text "bnelson607" to 37607. You should get a text message saying, "You've joined Bryan Nelson's session (BNELSON607)". This will need to be done at the beginning of every class.

**In addition to texting your answer, you can also download the Poll Everywhere app to your phone. It is available on both iOS and Android. Using the app is probably the easiest way to respond to these questions as it syncs directly with my presentations and allows you to effortlessly change your answers. You'll join my presentation by again using my username 'bnelson607'. The app came highly recommended from students in my classes last semester. Regardless of the method you use to submit your answers, you must create an account using the above steps.**

**Make sure you complete these steps before the second lecture on January 10. If you do not, you will not be able to participate and I will not be able to give you bonus points. For those of you who complete these steps before the first class on January 8, I will have at least two example questions so you can get a feel for how Poll Everywhere works; thus it would be wise to set up your account ASAP.**

**STAT 1100: Statistics and Probability for Business Management**  
**Spring 2018 Course Calendar**

Lecture	Day	Date	Topic	Due Dates (Lectures Covered)
	Monday	January 8	Introduction to Business Statistics	
1	Wednesday	January 10	Variable Types and Sampling Methods	
2	Friday	January 12	Surveys and Observational Studies	
	Monday	January 15	<b>NO CLASSES: MLK JR. DAY</b>	
3	Wednesday	January 17	Experiments	
4	Friday	January 19	Displaying and Summarizing Categorical Data	HW #1 Due (1-2)
5	Monday	January 22	Comparing Categorical Variables	Quiz #1 Due (1-3)
6	Wednesday	January 24	Displaying and Summarizing Quantitative Data I	
7	Friday	January 26	Displaying and Summarizing Quantitative Data II	HW #2 Due (3-5)
8	Monday	January 29	Comparing Quantitative Variables	Quiz #2 Due (4-5)
9	Wednesday	January 31	Basics of Probability	
10	Friday	February 2	More Probability Rules	HW #3 Due (6-8)
11	Monday	February 5	Random Variables	Quiz #3 Due (6-8)
	Wednesday	February 7	<b>Exam #1 (Lectures 1-8)</b>	
12	Friday	February 9	Binomial Distribution	
13	Monday	February 12	Calculating Normal Probabilities	Quiz #4 Due (9-11)
14	Wednesday	February 14	Finding Normal Distribution Percentiles	
15	Friday	February 16	Sampling Distribution of the Sample Mean	HW #4 Due (10-12)
16	Monday	February 19	Sampling Distribution of the Sample Proportion	Quiz #5 Due (12-14)
17	Wednesday	February 21	Confidence Intervals	
18	Friday	February 23	Hypothesis Testing I	HW #5 Due (13-16)
	Monday	February 26	<i>Review for Exam #2</i>	Quiz #6 Due (15-16)
	Wednesday	February 28	<b>Exam #2 (Lectures 9-16)</b>	
19	Friday	March 2	Hypothesis Testing II	
	Monday	March 5	<b>NO CLASS: SPRING BREAK</b>	
	Wednesday	March 7	<b>NO CLASS: SPRING BREAK</b>	
	Friday	March 9	<b>NO CLASS: SPRING BREAK</b>	
20	Monday	March 12	Hypothesis Testing III	Quiz #7 Due (17-19)
21	Wednesday	March 14	Inference for a Population Mean	
22	Friday	March 16	Inference for a Population Proportion	HW #6 Due (17-20)
23	Monday	March 19	Goodness of Fit Test	Quiz #8 Due (20-22)
24	Wednesday	March 21	Matched Pairs Test	
25	Friday	March 23	Inference for the Difference of Two Means	HW #7 Due (21-23)
	Monday	March 26	<i>Review for Exam #3</i>	Quiz #9 Due (22-23)
	Wednesday	March 28	<b>Exam #3 (Lectures 17-23)</b>	
26	Friday	March 30	Analysis of Variance (ANOVA)	
27	Monday	April 2	Multiple Comparisons	Quiz #10 Due (24-25)
28	Wednesday	April 4	Inference for the Difference of Two Proportions	
29	Friday	April 6	Test for Independence	HW #8 Due (24-25)
30	Monday	April 9	Introduction to Simple Linear Regression	Quiz #11 Due (26-29)
31	Wednesday	April 11	Assessing the Linear Regression Model	
32	Friday	April 13	Prediction Intervals and Confidence Intervals	HW #9 Due (26-29)
33	Monday	April 16	Multiple Linear Regression	
34	Wednesday	April 18	Lying with Statistics	
	Friday	April 20	<i>Review for Final Exam</i>	HW #10 Due (30-33) Quiz #12 Due (30-33)
	<b>Thursday</b>	<b>April 26</b>	<b>Final Exam (10 AM Class) (8:00 AM – 9:50 AM)</b>	
	<b>Friday</b>	<b>April 27</b>	<b>Final Exam (2 PM Class) (8:00 AM – 9:50 AM)</b>	
	<b>Saturday</b>	<b>April 28</b>	<b>Final Exam (11 AM Class) (8:00 AM – 9:50 AM)</b>	