Course Number: Math 201
Course Title: Statistics 1
Time and place: Section D: TuTh 2:00pm-3:15pm, UNI 343
Instructor: Professor William Zywiak (pronunciation hint: rhymes with kayak)
Email: WZywiak@Bryant.edu
Phone: 20226
Office Hours: MWF 1pm to 3pm other times available by appointment (email me).
　　　　　　You may also find me in my office by simply dropping by.
Office: Faculty Suite L: AKA the Honors Suite,
　　　Room 111 [to get to Suite L take the stairs across the elevator (next to UNI 267) to the lowest level
　　　　　　　　and bear left. After walking down the hall, take a right].
Mailbox: Faculty Suite L

Course Description:
This course is an introductory course to the topic of statistics. Topics include descriptive vs. inferential statistics, classical probability, probability distributions, the Central Limit Theorem, confidence intervals, hypothesis testing, simple linear regression, and correlation. The course also includes an introduction to using Microsoft Excel for statistical procedures.
Skills conferred: Data Analysis & Mathematical Reasoning.

Course Objectives:
--To be able to think statistically
--To be able to envision data graphically
--To be able to compute the mean for any type of data set
--To understand the intuitive concepts of the mean, median, and mode
--To be able to determine the median and modes for raw data sets
--To understand what's meant by variability
--To be able to compute the range, variance, and standard deviation
--To understand intuitively the meaning of probability
--To be able to determine and interpret binomial probabilities
--To be able to determine and interpret normal probabilities
--To understand the Central Limit Theorem
--To be able to determine and interpret confidence intervals for means and proportions; to understand error and the effects of its components upon its magnitude; to be able to determine sample size; to understand the role played by the Central Limit Theorem with regards to why confidence intervals work.
--To be able to do hypothesis testing problems regarding means, proportions, difference between two means, difference between two proportions.
--To understand and do the Chi-square test of independence.
--To understand simple linear regression, coefficients of determination and correlation, F-ratio, inferences regarding slope, confidence intervals and prediction intervals.

More On Email: I will periodically check email Monday through Friday, usually between 10:00 AM and 4:00 PM. I will also check email at least once on the weekend, and therefore, might not respond until the next school day. Please do not wait to the last minute to contact me. When emailing, please indicate you are in Math 201 in the comment section.

More on Office Hours, etc.:

Please let me know if you plan on stopping by my office, so that I can let you know if I am available. **I have a flexible schedule, so do not hesitate to ask to meet at a different time** (as my schedule permits). Do not hesitate to ask me for help if you are having problems understanding the class material.

In this course, and all your courses at Bryant, and throughout the Bryant learning community, we value and respect <u>diversity</u>. This includes differences in race, ethnicity, nationality, gender, gender identity, sexuality, socioeconomic status, ability, and religion.

My anecdotal experience tells me that you can reduce the number of colds you get by keeping your feet warm and dry, take vitamin C (or eat citrus fruits), and get enough sleep. If your shoes get wet, switch to dry shoes as soon as you can. (This advice is given in the context of the flu and COVID, which share symptoms with the common cold.)

<u>**Grade Based On:**</u>
Class participation <u>(20%)</u> Includes attendance, volunteering to answer my questions during class (even if not right), asking good questions (found useful by the rest of the class), bringing up pertinent examples (out loud), and reformulating (out loud) presented material indicating comprehension.
Excel Assignments: four during the semester **(<u>total 40%, 5% for the first three each, 10% for the 4th</u> Excel Assignment on "Good Health and Well Being" (UN SDG3), and 15% on the 5th Excel assignment on the Ngram database).** (Note that there are 17 UN Sustainable Development Goals and we will review these as an example of 17 dichotomous variables.) Excel assignments are due at the beginning of class. Please turn in on regular 8.5 x 11 printer paper. <u>Late Excel assignments will be accepted only up until the deadline of the next assignment</u>. Late Excel assignments will be penalized 1 point out of the 5 possible (or 3 out of 15 points for the Ngram assignment). The fifth Excel assignment can be turned in late (with the penalty) up until 2:05pm on December 12th. You may work by yourself or in pairs on all Excel assignments including the Ngram Viewer assignment. You should turn in your <u>own copy</u> of the first 4 Excel assignments. The fifth assignment should be turned in with two names if you worked in a pair. The Ngram Viewer assignment is due on **Th Nov 30th** (both an electronic version and a hard copy should be turned in by 2pm. <u>You will also be asked to give a brief presentation of your Ngram assignment on Dec 5 or 7 (12 if needed) worth **another 5%** of your grade</u>. The deadlines for the 3rd, 4th, and 5th Excel assignments depend on how quickly we go through the material, and deadlines will be announced at least 1 week ahead of time.

Ngram: email as attachments (don't share files): word doc, powerpoint figure(s) (or drop in word doc as an object), and data in excel.
Ngram: AND turn in a hard copy of the word doc and figure(s). (The hard copy is more important.)

        Based on Make It Stick: The Science of Successful Learning (2014, Brown, Roediger, & McDaniel) this semester will include seven quizzes (instead of two exams:)
Five best out of 6 Quiz Scores (<u>25% total</u>, 5% each) Quizzes will start on Tuesday **9-19** and will run every 2 weeks during the academic calendar (10-5, 10-17, 11-2, 11-16, and 11-30).   The first and third quizzes are on Tuesdays. The other four quizzes are on Thursdays. The last quiz will approximate the final. Since I am taking the top 5 out of 6 quiz grades, make-ups are not allowed until you have missed one quiz and expect to miss a second quiz (the make-up will be allowed on the second quiz you would have missed). You must request a make-up during or before the 14 minutes after the quiz starts. **Please go to the bathroom before the quiz (or Final) starts. You must complete the quiz in one sitting.**

Final Exam: <u>10%</u> of grade. Scheduled during finals period: M Dec 18th 2pm-4:30pm in the same room we have been in all semester. The second through fifth quiz will be somewhat cumulative. The 6th quiz

will be a shorter version of the Final. The Final will be based mostly on the six quizzes, so save your quizzes up until the Final.

First Excel Assignment: Due **Sept 19th** (at the beginning of class).
Enter this data in EXCEL (enter in the second column).
6   24   37   49   64
Also enter this data in EXCEL (enter in the third column)
111   114   117   118   120

For each set of data, use Excel to calculate the mean, median, SD, skewness, and kurtosis: In row 7 thru 11 of the first column type in "average" "median" "SD" "skewness" and "kurtosis" to label cells B7 thru B11, respectively. We will walk thru columns A and B in class before Sept 19th.
In the cell next to average type in "=AVERAGE(B1:B5)" and hit enter
In the cell next to median type in "=MEDIAN(B1:B5)" and hit enter
In the cell next to SD type in "=STDEV.S(B1:B5)" and hit enter
In the cell next to skewness type in "=SKEW(B1:B5)" and hit enter
In the cell next to kurtosis type in "=KURT(B1:B5)" and hit enter

Repeat for the data entered in column C.
Type your first name in cell A12 and your last name in cell B12 and turn in a hard copy.

There will be a total of five Excel assignments and these will be discussed in further detail later in the semester. Deadlines for the second and third will be indicated when the instructions are reviewed. You will have at least one week notice to complete each assignment. The Ngram assignment is the 5th Excel assignment. Examples of this 5th assignment from previous semesters will be provided in the Ngram Compendium.

Excel: all the statistical functions you will need for Excel Assignments 2-5, are under the "Data" menu, and out to the right is the "Data Analysis" button. If this doesn't appear in your version of Excel then do the following steps to add the functionality:
Go under "File"/ "Options", then click on "Add-ins" on the lefthand side of the screen. On the same screen you will see "Analysis Toolpack" over to the right side. Click that and then click "GO" below. NOTE: do not click "OK" on this screen. After you click "GO", then another screen will appear and then you click "OK". When you return to the main screen, the "Data Analysis" button will magically appear under the "Data" menu.

Electronics turned OFF:
All electronic items that communicate with other individuals and/or play music must be turned off. This includes phones of all types, PDAs, language translators, etc. Tablets/laptops/e-readers are discussed under the "Textbook" section of this syllabus.

Calculator
A calculator is required for every quiz, and a calculator will be helpful for completing the quiz. The calculator can just be a basic calculator with the four basic math functions and the square root function. A smart phone (etc.) is not considered a calculator (because it is a communication device, increasing the opportunity to cheat). **Do not share calculators back and forth during a quiz or exam, but you can leave your calculator with a fellow student (after showing me the display is cleared), if you are done with the quiz/exam.**

Textbook: (Note: other instructors will likely use Bluman or Navidi)

There is one inexpensive book required for this course.

        Derek Rowntree (2004). <u>Statistics without tears: A primer for non-mathematicians</u>. Boston: Pearson and Allyn and Bacon. ISBN: 0-205-39509-0

I will periodically email you articles and Excel assignments.

Tablets/laptops/e-readers are are not allowed during quizzes and exams. At no time are you to use you tablet/laptop/e-reader for anything but classroom discussions. Failure to abide by these rules may result, at my discretion, in the student not being able to use the above mentioned devices during class.

If you elect to print the material, student printing at Bryant is at a rate of $0.05/page for Black & White (B&W), but it is unknown if that is for single sided or double sided printing. A student is allocated $40 per academic year for printing. See http://intranet.bryant.edu/portal/laptop-central/laptop-faq/public-printing.htm for the latest information regarding printing at Bryant. My best guess is that it will cost approximately $15 if you were to print all the notes and homework for this semester in B&W (less if you can print double sided). Please note that some Blackboard images will be in Color, but they should print fine in B&W. Color printing is $0.50 per page (save your money – go B&W if you elect to print).

Reference Material:
Lecture material will be drawn from the reference material (Navidi and Monk) and a variety of other sources.
Other sources include: the one assigned paperback (Rowntree),

        Bluman, AG (2015) Elementary Statistics: A Step by Step Approach, A Brief Version, Seventh Edition, McGraw-Hill.

        Campbell & Stanley (1963). Experimental and Quasi-Experimental Designs for Research. Boston: Houghton Mifflin. (also on Reserve at the Library)

During course evaluations, a few students have asked for a more comprehensive textbook to be assigned. I have put the Navidi text on reserve at the library under my name.

I will also summarize material from "Statistics without tears," but you should obtain this shorter book, and do the readings as scheduled <u>before class</u> (see below). Doing the readings on time will help you to participate in <u>class discussions on the readings (class participation is 20% or your grade).</u>

Thursday 9-7	Intro and Chapter 1
Thursday 9-14	Chapters 2 and 3
Thursday 9-21	Chapter 4, the shape of the distribution
Thursday 9-28	Chapter 5 (e.g., sampling, distribution of sample means)
Thursday 10-5	Chapter 6 (e.g., significance testing) (skip pages 124-127)
Thursday 10-12	Chapter 7 (e.g., one and two tail tests)
Thursday 10-19	Attend a session at Day of Understanding
Thursday 10-26	Chapter 8 (e.g., correlations and regressions)
Tuesday 11-7	Michel (2011) Ngram article (read) and Bryant Ngram 2021 Compendium
Thursday 11-9	Zywiak & Niu (2021), Zywiak, Bobroff, & Niu (2021), McFadden et al.
Tuesday 11-21	Schafer et al. (2019) article (read some parts carefully, skim the rest)

<u>I will email you pdfs of the first two publications below</u>
Michel, J.-B., Shen, Y. K., Aiden, A. P., Veres, A., Gray, M. K. … (8 more authors), & Aiden, E. L.
      (2011). Quantitative analysis of culture using millions of digitized books. Science, 331: 176-182.

Zywiak, W. & Niu, G. (Editors) (2021). The Spring 2021 Ngram Project Compendium: Elevating an Interest in Stats and History through Linear Regressions and Lagged Correlations. 24 pages.

You will also be asked to read: and <u>these are open source articles (Google: "Zywiak SCIRP", click on relevant link, and download)</u>

Zywiak, W. H. & Niu, G. (2021). Love, Hope, Perspective, and Leadership in the Ngram Database: Solace for Modern Times. *Open Journal of Social Sciences, 9:* 159-166.

Zywiak, W. H., Bobroff, R. P., & Niu, G. (2021). Black Swan Years in American English, French, German, Hebrew, and Russian: Years that Reverberate in Ngram Viewer. *Advances in Historical Studies, 10:* 208-214.

McFadden, R., Zywiak, W. H., Bobroff, R. P., & Niu, G. (2022). War and Money in Ngram Viewer. Advances in Historical Studies, 11: 188-195.

<u>I will email you the following PDF</u>

Schafer, T. & Schwarz, M. A. (2019). The meaningfulness of effect sizes in psychological research: Differences between sub-disciplines and the impact of potential biases. *Frontiers in Psychology, 10* (813): 1-13.

<u>Resource for the Ngram Project</u> (placed on 2 hour Reserve) <u>under Professor Zywiak</u>:

National Geographic. 1000 Events that Shaped the World. Washington DC: National Geographic Partners.
Vaughn, S. (editor) (2018). Speeches that Made History. London: Octopus Publishing Group: Ltd.

<u>Other Relevant Information regarding the Math Dept.</u>:
Bryant University is one of the few undergraduate programs to offer a SAS certificate. It is jointly authorized by the SAS institute and Bryant University. Students who concentrate in Applied Statistics may earn a SAS certificate in data mining. Math 455, 460, 461, and 475 or 470 are required for the Math SAS certificate. I also teach Math 461.

Below are listed many rules, most covered by the general rule…
respect yourself, your fellow students, and the faculty and staff at Bryant University.

<u>**Evaluation**</u>:
1. Academic dishonesty and cheating will result in an "F" as your final grade, and may result in your expulsion from the University:
    a. Exams/quizzes require a calculator, pens/pencils, and are closed book. The only paper(s) present are the exam/quiz itself and a formula sheet and tables (Z and/or T) which I will supply. Any other papers or materials will be considered cheating, and therefore, will result in a zero on that exam/quiz and an "F" as your final grade.
    b. All work done in this course (exams/quizzes and assignments) is to be your own work and done only by you. If it is not your own work or if it is shared work, then that constitutes academic dishonesty (cheating). If you are caught cheating at any time on an exam/quiz or assignment, you will receive a zero on that exam/quiz or assignment and an "F" as a final grade. The one exception to this rule is the Excel assignments.
    c. All cheating will be reported to the Chair of the Mathematics Department and Academic Advising. This may result in expulsion from the University.
    d. Your Student Handbook has numerous examples of academic dishonesty and cheating. There is also a partial list towards the end of this syllabus of examples of academic dishonesty and cheating. Violating any of these items will result in an "F" as your final grade.

e. During quizzes/the final, there is no talking/contacting other people, **no electronic devices of any kind** (calculators are OK), no looking at other student's papers or calculators, no rummaging through purses, backpacks, clothing, etc., no sharing of calculators, no electronic searching for answers to problems, and anything else which could be considered academically dishonest. Please raise your hand if you have a question, or need something from your backpack, and we'll proceed from there.

f. All hats, hoods, etc. must be removed from your head during an exam/quiz. I need to see your eyes.

g. Using a cell phone or any other communication device during an exam will result in an F for that exam.

2. All graded work (exams/quizzes/assignments) is to be done in a professional and honest manner.

a. Legible handwriting. A zero will be assigned for a problem if I cannot read your writing.
Can you read this?

b. The use of proper English, grammar, punctuation, etc. when speaking and doing work. Using fragmented English, poor grammar, and improper punctuation will result in points being deducted. A zero will be assigned for a problem if I cannot understand what you are trying to say.

c. Being prepared for class, ensure you have a working calculator and pens/pencils. I do not supply calculators, batteries, or pens/pencils. You might get lucky and find someone who has an extra calculator, battery, or pen/pencil. Students cannot share calculators during an exam/quiz. Therefore, you may have to wait until someone else finishes their exam/quiz before you can calculate your final answers (since exams/quizzes have a time limit, you might not have enough time to complete your work). And just a reminder, a cell or smartphone is not a calculator.

d. Ensuring that all work submitted is presentable. Consider the work as part of a reflection of yourself, something that you would add to your resume. Among these, a torn out sheet of paper from a notebook with jagged edges is not acceptable, and will receive a reduced grade.

e. Common courtesies. Among those, food is not allowed in class (I've had students with various food allergies). You may bring a beverage.

f. No sleeping in class. That is a major "no-no" during a business meeting.

g. Continual disruption of class will result in you failing the course. This also includes items in the section "Electronics turned OFF".

3. There will be seven quizzes and a final exam given for this course.

a. There will be no absences allowed for the exam.

b. Once you have received your exam, you cannot leave the classroom without handing in your exam.

c. Anything discussed in class may be on an exam.

d. There are no retakes of an exam. Never give up during an exam. Whatever you do not answer on an exam will result in a zero score for those missed questions.

4. There will be five Excel assignments. Grading the Excel assignments will be based on using Excel correctly and writing satisfactory results.

5. Class attendance and promptness are expected and required. If you are absent, it is your responsibility to find out what you missed.

a. I will take attendance during class. You should also place your name tent in front of you, and bring a name tent with you to class. I will handout name tents on January 28th.

b. Not being in class counts as an absence. It does not matter if you are missing the class for a school event (trip, athletics, etc.), family/friend emergency, health related, religious reasons,

traffic, etc. <u>You are either in class or you are absent. There are no excused absences.</u> As a reminder from Health Services, they do not give notes excusing students from class.

c. The class starts at the designated time. Being late two times will count as 1 absence. Late for class is anytime from when I finished handing out name cards until 15 minutes after class has started. After 15 minutes, you are considered absent, even if you do show up for class.

d. Leaving in the middle of class for any period of time, or sleeping in class, will count, based on my discretion, either as an absence or toward one of the "two times" mentioned in the previous item.

e. Please be considerate and email me if you will be late or absent from class. If you want to share the reason for being late or absent, then go ahead, but it is not necessary.

f. If you are in a sanctioned school activity (marketing trip, debate, etc.) that coincides with an class date, please have your activity coordinator email me regarding the event.

g. If you are an athlete and will miss a class, please email me stating that you are missing the class. Any class you miss may be marked as an absence.

h. Based on the recommendation of the chair of the Mathematics Department, missing 2 classes during our first four classes will result in you being withdrawn from the class.

The Mathematics Department has a mandatory attendance policy for freshmen non-Math majors. For a TuTh class, the fifth (5th) absence by a student will result in the student failing the course with an "F" as their grade. Absentee Policy for Non-MATH-major Courses:
Beginning with the fall semester of 2015, all non-major freshman classes, M101, M110 E, M110, M129 and M201 will have a Standard Absentee Policy. This policy should be stated in all syllabi each semester: For classes that meet 2 days a week, a student will be dropped from the course with a grade of F, if they are absent **more than 4 classes**.
If a student exceeds the allowed limits specifically due to:

a. Athletic events or University off campus events that the student must attend
b. Prolonged illness that is verified by a health care professional
c. Family emergencies,

The professor can take this into consideration and has the right to assign an appropriate grade.

Miscellaneous:
Withdrawal from class: The final withdrawal date is set by the Office of Academic Records (Friday November 10th). If the online form is not completed appropriately, you will not be eligible to receive a grade of W.

Grading Policy:

0. I give as much partial credit as possible when I grade material.
1. I might adjust the grade on a quiz or exam based on any bias that I may have inadvertently introduced on a question (e.g. unclear instructions). But this is not a guarantee that I will adjust the grade (scale, curve, etc.) for every quiz or exam.
2. I might offer bonus points on a quiz.
3. I might offer bonus points on the Final Exam based on what I feel were the most missed questions during the semester. Therefore, I might drop hints when reviewing quizzes, so pay attention and save your quizzes during the semester.
4. If given, Extra Credit will be available to the entire class. Please do not send me an email asking for Extra Credit, because I will not reply.

5. The conversion from percentage to letter grades is:
   $93 \leq$ A ≤ 100

90 ≤	A-	< 93
87 ≤	B+	< 90
83 ≤	B	< 87
80 ≤	B-	< 83
77 ≤	C+	< 80
73 ≤	C	< 77
70 ≤	C-	< 73
67 ≤	D+	< 70
60 ≤	D	< 67
0 ≤	F	< 60

6. Your grade is your responsibility. I do not adjust grades, period. Items 1 – 5 in this section provide you the opportunity to be graded fairly by me, and the possibility of improving your own grade. So if you are a student who is on academic probation, or has a scholarship (athletic, academic, etc.), or is on the verge of failing the course, or just wants a higher GPA, please do not ask me to adjust your grade.

As stated in the "Office Hours" section, do not hesitate to ask for help if you are having problems understanding the class material. Do not wait until the Final Exam for help.

Please read the following list of items which are considered academically dishonest, and will result in you receiving an F as your final grade:
THE FOLLOWING ARE CONSIDERED ACADEMICALLY DISHONEST AND WILL BE SUBJECT TO THE PROCEDURES AND PENALTIES OUTLINED IN THIS SYLLABUS AND THE BRYANT COLLEGE STUDENT HANDBOOK.
1. Talking with or copying from another student during a quiz or exam.
2. Using an illegal cheat sheet during a quiz or an exam.
3. Obtaining test questions for an exam from another student who had already taken it.
4. Obtaining test answers for an exam from another student who had already taken it.
5. Turning in a paper or assignment that was written entirely or in part by another student.
6. Arranging with other students to give or receive exam answers by signals or electronic devices.
7. Delaying taking an examination or turning in a paper using a false excuse.
8. Changing a response after a paper, exam, or quiz was graded, then reported a misgrade and asked for credit for the altered response.
9. Claiming authorship of participation in a group or project when the student made no contribution.
10. Taking an examination for another student.

Sun	M	Tues	W	Thurs	F	Sat
Sept		5		7=Discuss		
		12		14=Discuss		
		19=Excel 1 due and Quiz 1		21=Discuss		
		26		28=Discuss		
Oct		3		5=Quiz 2 & Discuss		
		10		12=Discuss		
		17=Quiz 3		19=Day of Understanding		
		24		26=Discuss		
		30		2=Quiz 4		
Nov		7=Discuss		9=Discuss		
		14		16=Quiz 5		
		21=Discuss		Give Thanks		
		28		30=Quiz 6 & Ngram due		
Dec		5=Present		7=Present		
		12=Last Class				
	18=FINAL @ 2PM					

Final Thoughts: Know that the faculty at Bryant want all the students to succeed. With this in mind, I wanted to let you know about many resources that are available. If you have a roommate(s) you might also check-in with them periodically to see which course they find most challenging and let them know about supports available at Bryant. First, you can talk to me after class, or stop by my office hours. If my office hours are not convenient, then please suggest another time. I am on campus MTWRF. Second, you can reach out to your advisor. Third, there is the Academic Center for Excellence. If you are not familiar with this office, please drop in and see their diverse offerings. I would recommend taking all 6 of your syllabi and creating a calendar with deadlines, quizzes, and tests, for all 5 courses on the same pages. This will let you see when you will have a time crunch in the semester, and when you should try to get ahead on some assignments/studying.

Online you can go to www.studentlingo.com/bryant
There are over 20 student success videos, and some are available in Spanish.

All your professors went through an undergraduate curriculum, so you might pick the brains of professors you have had in the past, to see what strategies they used to maximize their GPA with the least amount of stress. Feel free to ask me too.

If you are experiencing excessive anxiety, depression, bereavement, or other negative emotions, you might want to make use of the confidential services available at Counseling Services (in the John Chafee Center, downhill and across the street from the Koffler Center). Also, if your roommate seems to be overwhelmed by academics or campus life, you might want to share this addendum with them, or even walk them over to the Counseling Center. Intense depression for example, can give people tunnel vision, so they lose awareness of the supports around them, so please remind your roommate in this scenario.