MONTGOMERY COLLEGE ROCKVILLE CAMPUS DEPARTMENT OF MATHEMATICS SYLLABUS – MATH 117 ELEMENTS OF STATISTICS Spring 2019

Instructor Information		Course Information	
Instructor: Office: Email: Talbot's Offic	Stephanie Talbot SC 254 N, Stephanie.talbot@MontgomeryCollege.edu e Hours:	CRN: Refund: No Grade Recorded/Change to Audit: Withdrawal with a Grade of W: The final exam:	
or by appointment		If you wish to withdraw from the course at any time	
Classroom/Times: S		you must do so at the Records Office.	
Blackboard: All course material will be posted here			
Online Softwa	re: WileyPlus (includes access to eText)		
	and STATKEY		

Your best way to contact me is via email!!! Please use your college email for all communications!

Course Description: An introductory non-calculus statistics course to serve a variety of students who need a working knowledge of statistics. Topics include descriptive analysis and treatment of data; scatterplots, linear regression and correlations; bootstrapping and randomization distributions; calculating, analyzing, and interpreting hypothesis tests and confidence intervals for one- and two-variable means and one- and two-variable proportions. Preexisting statistical computer programs may be used for some applications. Credit may not be earned in both MATH 117 and MATH 117s. PREREQUISITE: A grade of C or better in MATH 093, MATH 096, or MATH 115A; appropriate score on mathematics assessment test, or consent of department. Assessment levels: ENGL 101/101A, READ 120. Three hours each week. Formerly MA 116.

Course Outcomes

Upon course completion, a student will be able to:

- Calculate and interpret confidence interval estimates of population parameters (proportions and/or means)
- Demonstrate an understanding of the importance that random sampling and randomization play in
- producing data that allow one to draw conclusions about the underlying populations.
- Explain that statistical procedures have specific requirements necessary for their application and verify that the fulfillment of these requirements has been satisfied for the situation with which the student is dealing.
- Express in clearly written form, and always in the context of the particular problem situation, the results of statistical investigations and analyses
- Formulate and conduct tests of significance for population parameters (proportions and/or means) and interpret the results in the original context.
- Use a variety of graphical and numeric tools to explore and summarize categorical and quantitative data, including linear models of associations between two quantitative variables.
- Use statistical software (computer- or calculator-based) to explore and analyze data and interpret the results produced by that software in context.
- Use the results of the central limit theorems for sample proportions and sample means to predict the longterm patterns of variation of those statistics under repeated sampling based on an understanding of the normal distribution.

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MATH 117 fulfills a General Education Program Mathematics foundation requirement. Montgomery College's General Education Program is designed to ensure that students have the skills, knowledge and attitudes to carry them successfully through their work and personal lives. This course provides multiple opportunities to develop two or more of reasoning, technological competency, and information literacy. For more information, please see http://cms.montgomerycollege.edu/gened/

Prerequisite: Appropriate score on the mathematics assessment test, a grade of C or better in MATH 093 or MATH 096, or consent of department. Assessment levels: EN 101/101A, RD 120

Course Homework technology/Textbook:

WileyPlus with online-only version of book, Lock: *Statistics 2e*, WileyPlus. Access code from the Bookstore, ISBN:9781119163626 (Note - this may also be purchased directly from www.wileyplus.com for a slightly lower price)

OR

WileyPlus with online-only version of book **and loose-leaf text**, Lock: *Statistics 2e*, WileyPlus. Access code from the Bookstore, ISBN:9781119309499 (Note - this may also be purchased directly from <u>www.wileyplus.com</u> for a slightly lower price)

Calculator policy: TI-83/83+ or 84/84+ (Symbol-manipulating calculators such as the TI-89 and TI-92 are not permitted) The Ackerman Learning Center offers a loaner program for semester. You must go and get a form for me to sign.

How to Register for My Course on WileyPlus: Your Course Name: Your Course ID:

COURSE REQUIREMENTS

ATTENDANCE: Be present for all classes Homework:

You will have textbook and online homework assignments. You must keep a written record of the online work in a notebook. Because this is an intense 3-credit course, you should be prepared to spend a **minimum of 6 -10 hours per week outside of class** working on homework and studying. All homework will be online using WileyPlus software/ e text.

You are responsible for:

- Answering reading assignment questions (often called preclass activities, which are due at the very beginning of class)
- Reading/reviewing all notes /examples
- Completing all homework assignments, both paper and online show all work on paper
- Practicing more problems from the book when you need to focus on a particularly challenging topic

You must set aside a significant amount of time for learning the material in this course; it is recommended you set aside **6-10 hours per week** studying for this class.

Quizzes : will be announced and will require the use of technology; Calculator, Statkey You may NOT share calculators.

Labs: Graded formal lab projects that will require use and mastery of technology and understanding of content.

Tests: There will be 2 Tests, 1 "Quest", 1 Final Exam All tests will require use of technology: Statkey / Calculator

Tips for success:

- Complete the reading before a new unit begins, and then review again after the unit is over.
- Be an active participant during class time. Ask questions during class or office hours, or by email.
- Give yourself plenty of time to prepare for exams.
- Do not procrastinate don't let a unit go by with unanswered questions as it will just make the following unit's material even more difficult to follow.

Grading Policy and Criteria:

A (90-100%) B (80-89%) C (70-79%) D (60-69%) F (0-59%)

Methods of Evaluation:

Test 1	17 %
Test 2	17 %
"Quest"	12 %
Quizzes	12 %
Homework	5 %
Labs + Preclass	17 %
Statistics Final Exam	20 %
TOTAL	100%

Exams / Quizzes

You will be given a zero for every exam missed, and NO MAKE UPS WILL BE GIVEN, except in situations of <u>extreme</u> emergencies.

On a test/quiz day: I will not provide calculators/pencils. You will not be permitted to share calculators. You may not use or hold a cell phone.

**** The following applies to students who miss at most 2 classes during the semester and maintains a B average for homework. If your percentage grade on your final exam is better than that of your worst test, this test's grade may be replaced by your final exam grade. ***

Make-up Policy: For special circumstances only, one test might be made up, as long as I am notified on or before the test. Otherwise the test will be recorded as a zero.

At the end of the semester, one lowest homework, one lowest quiz and one lowest lab/preclass grade will be dropped – there will be **NO MAKEUP QUIZZES**. No late work will be accepted.

Attendance Policy: You are expected to be in class every day, on time, and YOU are responsible for making up all work missed due to the absence. In the event of an emergency or other extreme situation, please <u>email</u> to let me know why you were absent and to find out what you have missed. Three 5-minute tardies will be recorded as 1 absence. If you miss 3 or more days, you may be dropped from the class.

Accommodations for Students with Disabilities Statement: Disability Support Services (240-567-5058) Any student who may need an accommodation due to a disability, please make an appointment to see me during my office hour. A letter from Disability Support Services (CB122) authorizing your accommodations will be needed. Any student who may need assistance in the event of an emergency evacuation must identify to the Disability Support Services Office; guidelines for emergency evacuations for individuals with disabilities are found at: www.montgomerycollege.edu/dss/evacprocedures.htm If you are a veteran or on active or reserve status and you are interested in information regarding opportunities, programs and/or services, please visit the Combat2College website at www.montgomerycollege.edu/combat2college/and/or contact_Joanna Starling at 240-567-7103 or Joanna Starling at 240-567-7103 or www.montgomerycollege.edu.

Delayed Opening or Closing of the College: Because of inclement weather or utility or for other reasons, it may be necessary to delay opening or suspend all operations of the College or an individual campus. Because this course is entirely online, you are expected to continue working on material as scheduled. If you are experiencing a power outage, please leave a voice message on my office phone.

Ackerman Learning Center: You may receive help here from faculty or student tutors. You may also borrow a TI graphing calculator here for one day or for the entire semester. You should take advantage of this excellent resource center.

Rockville Campus, Judy Ackerman Learning Center SW 109 240-567-5200, Please check for hours. <u>http://cms.montgomerycollege.edu/AckermanSTEMLearningCenter/</u>

Important Student Information Link

In addition to course requirements and objectives that are in this syllabus, Montgomery College has information on its web site (see link below) to assist you in having a successful experience both inside and outside of the classroom. It is important that you read and understand this information. The **link below provides** information and other resources to areas that pertain to the following: student behavior (student code of conduct), student e-mail, the tobacco free policy, withdraw and refund dates, disability support services, veteran services, how to access information on delayed openings and closings, how to register for the Montgomery College alert System, and finally, how closings and delays can impact your classes. If you have any questions please bring them to your professor. As rules and regulations change they will be updated and you will be able to access them through the link. If any student would like a written copy of these policies and procedures, the professor would be happy to provide them. By registering for this class and staying in this class, you are indicating that you acknowledge and accept these policies.

http://cms.montgomerycollege.edu/mcsyllabus/

Final Note: I am available during scheduled office hours and additional hours by appointment. I strongly recommend seeking help. Another useful study method is to form study groups, which I will foster during in-class activities. I look forward to a successful semester with you.

COURSE OUTLINE: These dates are approximate and subject to change.

DATES	Textbook	STATISTICS TOPICS
	Section	
Week 1	1.1-1.2	Intro to Stats, WileyPlus, STATKEY, Collecting Data (Sampling from a
Jan 21-27		population, Experimental and observational studies)
Week 2	1.3, 2.1 -	Describing Data (Categorical and quantitative variables), Outliers
Jan 28- Feb 3	2.2	
Week 3	2.3 - 2.4,	Boxplots, histograms, scatterplots, correlation, linear regression, residuals
Feb 4 - 10	2.5 - 2.6	
Week 4	2.7, Test	linear regression, residuals, multivariable data visualizations,
Feb 11-17	1,	Review Chapters 1-2,
Week 5	Test 1,	Statistics Exam 1 (Chapters 1 – 2), Confidence Intervals (Sampling
Feb 18 - 24	3.1-3.2	distributions, interpreting confidence
		intervals
Week 6	3.3 – 3.4	Confidence Intervals (Bootstrap distributions, interpreting confidence
Feb 25 - Mar 3		intervals)
Week 7	4.1 - 4.2	Hypothesis Testing (Intro to hypothesis testing, p-values, statistical
Feb 25 – Mar 3		significance, formal conclusions of tests)
Week 7 cont	4.3 – 4.4	Randomization distributions, relationship between CI and HT
Mar 4 - 10		
Week 9/10	4.1-4.4 lab	Review Chapters 3 – 4, Review for Statistics Exam 2 (Chapters 3 – 4), Test
Mar 18 - 26		2 (Ch 3-4)
Week 10 con	5.1 - 5.2	Inference with Standard Normal and Normal probability distributions
Mar 27-31		
Week 11	6.1-6.2	Confidence Intervals and Hypothesis Tests for Single Proportions and Single
April 1 - 7		Means; includes checking basic assumptions and SE calculations,
Week 12	6.3	Confidence Intervals and Hypothesis Tests for Difference of Proportions
Apr 8 - 14		
Week 13	6,4	Confidence Intervals and Hypothesis Tests for Difference of Means
Apr 15 - 21		
Week 14	6.5	Matched Pairs, Review of Chapter 6 Material
Apr 22 - 28		
Week 15		"Quest" on Chapter 6
Apr 29 – May 5		Review for Cumulative Final Exam
Week 16 May 6		LAST CLASS REVIEW
Week of finals		Final exam, Monday May13th from 12:30 – 2:30pm in SC 260

how to take this course:	Present	Engagod	
It's not what you "sot" in this	Flesen	Eligageu	All In
it's not what you get in this			
Course, it's now deep you go.	you need the basic outlines	you have a grasp of the	you want to go deeper into
People take a Statistics course	of Statistics the highlights,	basics and are ready to	the concepts, using the
for lots of reasons, usually	the main concepts & ideas,	think Statistically and	cognitive equipment &
variations on "it's required."	the surface-level	explore what's below the	tools of statistics as a
Think about why someone has decided that learning this	knowledge.	surface.	focused critical thinker
material might be essential to		Perhans you've taken	
vour college experience, and	There's nothing wrong with	statistics before, or are a	Experienced? You are well
what that means for you	staving in the Present: this	heginning Data Science	aware of the connection of
personally	approach may work for you	major. You already know	mathematics and statistics
personany.	if this is likely to be your	that statistics is a poworful	and how statistics
	only Statistics/math course	tool used in every facet of	
It is entirely possible to do well	or if you've never taken one	daily life such as elections	processes are constructed.
in the class without being	before & it's all new	madicing production of	
transformed by your pewfound	before & it's an new.	medicine, production of	
statistical knowledge, but it	Those "Present "will tend to	goods, pharmaceuticais	Those "All In"
would be a darn shame. Llike	assume that textbook	Those "Engaged" notice	actively seek additional
to think that this (and indeed	documents and professor	note Engaged houce	uses and understand the
any) course operates on three	are mutually reinforcing	inconsistensies and they	value of statistical
levels	telling basically the same	respectfully shallonge	Interpretations and how
Present Engaged and	information Those Present	respectfully challenge	some even seek to abuse
	are mainly concerned with	interested in LOW 8	the processes to deceive
ALL IN.		things are as the	or for fraudulent
	WHAT IS STATISTICS.	things are as they are	endeavors.

Course Requirements

This course involves reading, writing, group discussion and problem solving. It is fast-paced; you will need to absorb textbook material **on your own** outside of class. You will work problems and write all answers in complete, grammatically correct sentences. You will need to put in consistent effort throughout the whole semester. You will need to speak up in class and demonstrate active learning, not passive absorption. Learning is not a spectator sport.

Attendance and Daily Work I take attendance in each class. Be on time and ready for discussion each day. I expect class discussion will be lively, respectful, substantive, and that you will have done that day's assigned reading before class. There's no such thing as an "excused absence" – you're either in class, or you're not. Daily Work may include quizzes, discussion questions, in class short exercises, lab work and class participation. These cannot be made up, since they depend on being present in class. Late work will not be accepted.

Exams (54%) We will have 3 exams. The last one will take place during the final exam period (a cumulative final). there are no makeup exams. You **MAY** be eligible for Test 1 or Test 2 replacement if your Final % is higher.(certain conditions apply)

The Grading Policy

Your grade is weighted. Just like money, different items have different value. (1 dollar is worth more than 99 pennies, 9 dimes, or 3 quarters.) Notice that TESTS have highest value! HW is expected in college. It is not worth as much as other components.

Exam 1 - 100 pts	17%
Exam 2 - 100 pts	17%
Quest - 50 pts	12%
Quizzes - 100 pts	12%
HW –	5%
Pre-class +	
Lab Activities –	17%
Final Exam - 150 p	ts 20%

Total: 100%