

## MATH117 Elements of Statistics

### **Class Meetings :**

### **Instructor**

Department of Mathematics & Statistics,

Email:

Office Hours:

### **Administrative Deadlines**

Last Day to Drop with Refund:

Last Day to Drop with No Grade; Change Audit/Credit:

Last Day to Withdraw with Grade of *W*:

Final Exam:

### **Catalog Description**

An introductory non-calculus statistics course to serve a variety of students who need a working knowledge of statistics. Descriptive analysis and treatment of data, probability and probability distributions, statistical inferences, linear regression and correlations, chi-square, and some nonparametric statistics. Preexisting statistical computer programs may be used for some applications.

PREREQUISITE(S): A grade of C or better in MATH 050 or MATH 092; or concurrent enrollment in MATH 017; or consent of department. Assessment levels: ENGL 101/101A or ALRW 940/ELAI 990; READ 120 or AELR 930.ELAR 980. Six hours each week. Formerly MA 116.

### **General Education**

This course fulfills the Mathematics Foundation requirement for General Education (MATF).

## Course Outcomes

- 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 theorem for sample proportions and sample means to predict the long-term patterns of variation of those statistics under repeated sampling based on an understanding of the normal distribution.

**Pedagogy:** This will probably be quite different from any math course you have taken before. You will have to set aside a significant amount of time for reading course materials, doing homework and practice questions for tests. It is recommended to spend at least 2 hours for every hour of classroom lecture. You have to make this commitment; otherwise chances of success will be greatly diminished.

## Required Materials & Supplies

**Required textbook:** Statistics Wileyplus access code ( Lock: Statistics 2e) or **physical text packaged with WileyPlus access code:** 2e. See the textbook and registration details at the end of the syllabus.

- Required Technology StatKey: <http://www.lock5stat.com/StatKey/> (free)
- **[Required] Calculator:** You should have a calculator that does basic statistical computation. TI-83 or 84 series calculators will suffice, and are commonly used in high schools. You can rent instead of buying one from the MAPEL center (HT 229)
- **[Required] Internet Access:** Each student must have regular and reliable access to the Internet in order to access our class *Blackboard* site and MC Email.

## Student Email & Blackboard Use

MC Email is the predominant venue for communication between student and instructor. You are expected to check your MC email at least daily. When you wish to contact me efficiently, I prefer that you email me from your MC email account whenever possible. Be sure to write your email messages in a style appropriate for professional communication; email between you and your professor is subject to a different set of norms than text messages between friends! Always identify yourself, reference this course, and if you ask a question or make a request, be sure to check back for a response in a timely manner.

## Assessment

MATH 117 course materials are grouped into 3 thematic units.

- **Homework** is assigned in Wileyplus with deadlines. Homework is due before the Unit test (midnight). If for some reason you miss the homework deadline, you will still be able to access and continue working on homework, however, for that portion of the homework and because of late submission 10% of the homework scores will be deducted.
- There are **three quizzes** assigned for each unit to assess your understanding of the subject and your progress.
- There are **three Unit tests** scheduled for each test. Unit test is focused only on unit material and measures your progress and understanding of the particular section of the class.
- There is a **final exam** scheduled at the end of the course. The final exam is cumulative, which means it covers all the course material.

**Make-up Policy: Late and/or Make-up Policy for Coursework:** If for some reason you cannot take or choose not to take one of two unit tests, your Final Exam grade will substitute for that missing test grade. For example, if you take only 1 of the 3 tests, your score for 2 tests will then count for 20% of your course grade, while your final exam grade will then count for 45% of your course grade. You may not miss more than one test ! A grade of "F" will be entered for 2-nd missed test! Same rule applies to quizzes: if you take only 2 of the 3 quizzes, your 2 quizzes will then count for 10% of your course grade, and the final exam "weight" will be increased by 5 %. Please also note that voluntarily choosing to add additional weight to the Final Exam can prove to be a VERY risky strategy. Exams must be completed when given unless prior arrangements have been made.

**Course Grades:** Your numerical score will be determined as follows:

<b><u>Assessment</u></b>	<b><u>Weight</u></b>
Classwork/Participation	10 pts.
WileyPlus Homework	15 pts.
Three quizzes, 5 pts. Each	15 pts.
Three tests, 10 pts. each	30 pts.
<u>Final Exam</u>	<u>30 pts.</u>
<i>Total</i>	<i>100 pts.</i>

Course grades are then assigned as follows:

<b><u>Numerical Score</u></b>	<b><u>Letter Grade</u></b>
At least 90	A
At least 80 but below 90	B
At least 70 but below 80	C
At least 60 but below 70	D
Below 60	F

In order to protect your privacy, grades will not be given out via email or phone. Final course grades will be posted on MyMC as soon as they are known. Meanwhile, your progress in the course is to be measured by your achievement of the learning objectives. This information will be provided to you constantly in the Blackboard, after the first week or two of its use. If you would like help interpreting your progress at any point, please ask.

### **Classroom Policies**

*Take Ownership.* My job is to help you learn, and I will try to do so creatively and enthusiastically. But the responsibility for learning is yours. Learning new concepts can be difficult, and it is impossible to do without time, energy, and struggle, no matter how helpful your professor is! You are expected to take responsibility for your own learning.

*Attend & Participate.* You are expected to attend and participate in all class meetings. Asking questions, contributing to discussions, and respectfully listening to classmates are examples of ways to contribute positively. *Keep Informed.* Instructions for assignments, class handouts, and important announcements will be posted our course Blackboard site.

### **Getting Help**

There are many resources that can help you to be successful in this course. You will need to attend class and participate actively, work hard, and do practice and homework problems on your own. In addition, you can do the following:

- Take advantage of the MAPEL (MATH Learning Center) which offers [tutoring](#), [current text books](#), [a computer lab](#), [calculators](#), and review sessions. Visit the MAPEL Center (HT 229).  
<http://www.montgomerycollege.edu/Departments/mathlcgt/index.html>
- Send me email. While some questions are difficult to ask or answer via email, I will answer those that I can
- Meet with classmates outside of class for study groups, get help from friends.

	Tentative Schedule Spring 2020 MATH 117	HW	Deadline
	Unit 1		
27-Jan	Introduction / Syllabus review	Chapters 1 and 2	February 23 , 11:59 PM
29-Jan	Ch. 1.1 The structure of Data		
31-Jan	Ch 2.1 Categorical Variables		
3-Feb	Ch. 2.2 One Quantitative Variable: Shape and Center		
5-Feb	Ch. 2.3 One Quantitative Variable: Measures of Spread		
7-Feb	Ch. 1.2 Sampling from a Population,		
10-Feb	Unit 1 Quiz (sections: 1.1, 1.2, 2.1, 2.2, 2.3)		
12-Feb	Ch. 2.4 Outliers, Boxplots, and Quantitative and Categorical Relationships		
14-Feb	Ch. 2.5 Two Quantitative Variables: Scatterplot and Correlation		
17-Feb	Ch. 2.6 Two Quantitative Variables: Linear Regression		
19-Feb	Ch. 2.7 Data Visualization and Multiple Variables		
21-Feb	Ch. 1.3 Experiments and Observational Studies		
24-Feb	Unit 1 Test Sections: (1.1, 1.2, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7)		
26-Feb	Ch: 3.1 Sampling Distributions	Chapters 3, 4 and 5.1	March 29, 11:59 PM
28-Feb	Ch.3.2 Understanding and Interpreting Confidence Intervals		
2-Mar	Ch. 3.3 Constructing Bootstrap Confidence Intervals		
4-Mar	Ch. 3.4 Bootstrap Confidence Intervals using Percentiles		
6-Mar	Ch. 4.1 Introducing Hypothesis Tests		
9-Mar	Unit 2 Quiz (sections: 1.3, 3.1, 3.2, 3.3, 3.4, 4.1, 4.2, 4.3)		
11-Mar	Ch. 4.2 Measuring Evidence with P values,		
13-Mar	Ch. 4.3 Determining Statistical Significance		
23-Mar	Ch. 4.4 A closer Look at Testing		
25-Mar	Ch. 4.5 Making Connections		
27-Mar	Ch. 5.1 Hypotheses tests Using Normal Distributions		
30-Mar	Unit 2 Test (sections: 1.3, 3.1, 3.2, 3.3, 3.4, 4.1, 4.2, 4.3, 4.4, 4.5, 5.1, 5.2)		
1-Apr	Ch. 5.2 Confidence intervals using Normal Distributions	Chapters 5, 6 and Section 7.1	May 10, 11:59 PM
3-Apr	Ch. 6.1 D Distributions of a Sample Proportion		
6-Apr	Ch 6.1 CI Confidence Intervals For a Sample Proportion		
8-Apr	Ch. 6.1 HT Hypothesis Test for a single Proportion		
10-Apr	Ch. 6.2, D , HT CI for single Mean		
13-Apr	Ch 6.3 D Distributoin for a difference of proportions		
15-Apr	Ch 6.3 CI Confidence Interval for a difference of proportions		
17-Apr	Ch.6.3 HT Hypothesis Test for a difference of proportions		
20-Apr	Unit 3 Quiz (Sections: 6.1, 6.2, 6.3, 6.4, 6.7, 6.8, 6.9, 6.4, 6.5)		
22-Apr	Ch 6.4 D Distribution of a Difference of Means		
24-Apr	Ch 6.4 CI Confidence Interval for a difference of means		
27-Apr	Ch. 6.4 HT Hypothesis Test for a difference of means		
29-Apr	Ch. 6.5 Paired Differnece in Means		
4-May	Unit 3 Test (Sections 6.1, 6.2, 6.3, 6.4 and 6.5)		
6-May	Ch. 7.1 Testing Goodness of Fit Test for a single categorical variable		
8-May	Final Exam Review		
11-May	10:15AM - 12: 15 PM FINAL EXAM		

### 3 Collection of Open Educational Resources:

OER's Link	Name/Description/Any cost associated?
<a href="http://lock5stat.com/statkey/">http://lock5stat.com/statkey/</a>	The Lock5 "StatKey" applets/used by Lock's book/free
<a href="http://www.rossmanchance.com/ISIapplets.html">http://www.rossmanchance.com/ISIapplets.html</a>	The "ISI" Applets/ used by Tintle's book, authored by Beth Chance/free
<a href="http://www.rossmanchance.com/applets/">http://www.rossmanchance.com/applets/</a>	Rossman/Chance Applet Collection/ used by Rossman's book/free
<a href="http://homepage.divms.uiowa.edu/~mbognar/">http://homepage.divms.uiowa.edu/~mbognar/</a>	Matt Bogner has a great site to view many distributions/free
<a href="http://www.wolframalpha.com">http://www.wolframalpha.com</a>	WolframAlpha/Computational Knowledge Engine/it depends
<a href="https://www.geogebra.org/">https://www.geogebra.org/</a>	Geogebra/Dynamic mathematics for learning and teaching mathematics including probability and statistics/free
<a href="http://oli.cmu.edu/courses/free-open/statistical-reasoning-course-details/">http://oli.cmu.edu/courses/free-open/statistical-reasoning-course-details/</a>	Statistical Reasoning/Carnegie Mellon University Open Learning Initiatives/free online course
<a href="https://www.openintro.org/stat/">https://www.openintro.org/stat/</a>	OpenIntro/Intro Stat with Randomization and Simulation/free online course
<a href="http://www.montgomerycollege.edu/statistics">www.montgomerycollege.edu/statistics</a>	Statistics Video Project/Videos/free
<a href="https://www.khanacademy.org/math/probability">https://www.khanacademy.org/math/probability</a>	Khan Academy/Videos/free
<a href="https://www.random.org/integers/?mode=advanced">https://www.random.org/integers/?mode=advanced</a>	Random Integer Generator/free

#### Changes to this Syllabus

This syllabus is tentative. I reserve the right to make changes to the content herein as the semester continues. Any changes will be published on our Blackboard site and announced in class.

#### Important Student Information Link

In addition to course requirements and objectives that are in this syllabus, Montgomery College has information on its web site 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/>



① **REQUIRED**

Choose Only 1 of 2

**OPTION 1**

**Statistics: Unlocking the Power etc (LL) (w/Wiley Plus Access)**



**Statistics: Unlocking the Power etc (LL) (w/Wiley Plus Access)**

**Edition:** 2nd

**ISBN:** 9781119309499

**Author** Lock

**Publisher:** John Wiley & Sons, Incorporated

**OPTION 2**

**Statistics (Wiley Plus Code)**



**Statistics (Wiley Plus Code)**

**ISBN:** 9781119163626

**Author** Lock

**Publisher:** John Wiley & Sons, Incorporated

**MONTGOMERY COLLEGE -- BASIC NEEDS STATEMENT**

**“Any student who has difficulty accessing sufficient food to eat every day, or who lacks a safe and stable place to live, is urged to contact the *Dean of Students Affairs* (see listed below) on your campus. Furthermore, please notify the professor if you are comfortable in doing so. This will enable the professor to provide any resources that they may possess. We know this can affect performance in the course and Montgomery College is committed to your success.”**

**The *Deans of Student Affairs*, by Campus**

**Germantown:**

Dr. Jamin Bartolomeo, [jamin.bartolomeo@montgomerycollege.edu](mailto:jamin.bartolomeo@montgomerycollege.edu)

**Rockville:**

Dr. Tonya R. Mason, [tonya.mason@montgomerycollege.edu](mailto:tonya.mason@montgomerycollege.edu)

**Takoma Park/ Silver Spring:**

Ms. Janeé McFadden, (Interim), [Janee.McFadden@montgomerycollege.edu](mailto:Janee.McFadden@montgomerycollege.edu)



### STUDENT HEALTH AND WELLNESS CENTER = "SHAW CENTER"

This website offers information about resources for food on our campuses and in the community and has links for community resources. The site offers the schedule for the mobile markets, locations of the food pantries as well as a link for those who wish to contribute their time or money to support our students

<https://www.montgomerycollege.edu/life-at-mc/student-health-and-wellness/index.html> Contact: [SHaWCenter@montgomerycollege.edu](mailto:SHaWCenter@montgomerycollege.edu)

### MOBILE MARKETS

The College has a partnership with the Capital Area Food Bank. They distribute a variety of foods at Mobile Markets, at each of the three main campuses. Food is available on a first-come basis for MC students, faculty/staff, and the community. The markets are open to the entire community. No proof of eligibility is required. **For information on volunteering at the Mobile Markets, reach to Student Affairs, [Carmen Poston-Travis](#) 240-567-5253.**

Campus	Mobile Market Location	Time and Dates All dates are Wednesdays
<b>Germantown</b>	Outside Student Affairs (SA) (In inclement weather - High Tech Building (HT), Second Floor Lobby)	
<b>Rockville</b>	Outside North Garage (1st floor mobile entrance, North Garage for inclement weather)	
<b>Takoma Park/Silver Spring</b>	Outside Student Services (ST) Building (ST atrium for inclement weather)	

### CAMPUS FOOD PANTRIES

Each of the main campuses has one or two small food pantries with snacks and food. Students are welcome to come pick up a snack to carry you through your next class, and to take a few items home.

<b>Campus</b>	<b>Pantry Location</b>	<b>Days &amp; Hours of Operation</b>
<b>Germantown</b>	<i>High Tech Building (HT) Food Pantry</i> In the hallway, near HT300	
<b>Rockville</b>	<i>Women's' and Gender Studies Program Food Pantry</i> Hallway outside of MT212 <a href="mailto:Geneveive.Carminati@montgomerycollege.edu">Geneveive.Carminati@montgomerycollege.edu</a>	
<b>Rockville</b>	<i>Biology Department Food Pantry</i> Science Center, 2 <sup>nd</sup> floor hallway <a href="mailto:Rebecca.Thomas@montgomerycollege.edu">Rebecca.Thomas@montgomerycollege.edu</a>	
<b>Takoma Park/Silver Spring</b>	<i>Commons Food Pantry</i> CM 110 <a href="mailto:Jeff.Chuang@montgomerycollege.edu">Jeff.Chuang@montgomerycollege.edu</a>	
<b>Takoma Park/Silver Spring</b>	<i>Institute for Race, Justice, and Civic Engagement Food Pantry</i> Pavilion 4, #202 <a href="mailto:Vincent.Intondi@montgomerycollege.edu">Vincent.Intondi@montgomerycollege.edu</a>	
<b>Takoma Park/ silver Spring</b>	Two new TPSS locations will be coming soon: -Cafritz Art (CF) #145 and -Academic Success Center, 2 <sup>nd</sup> floor, Health Sciences <a href="mailto:Kim.McGettigan@montgomerycollege.edu">Kim.McGettigan@montgomerycollege.edu</a>	