Introduction to Probability and Statistics

MAT 133.I51

Semester: FA20

Number of Credits: 4

Days Class Meets: Monday & Wednesday

Meeting Times: 6-8pm

Class Dates: 8/31/2020-10/19/2020

Location/Venue: Zoom link

Instructor: Sara Main

Contact Phone: _____

Contact Email: mainsaral@jccmi.edu

Online Student Hours: see end of syllabus

Remind: www.remind.com (ID: @fl207)

Course Descriptions

This course is an introduction to experimental design, data representation, basic descriptive statistics, probability theorems, frequency distributions and functions, binomial and normal probability distributions and functions, probability density functions, hypothesis testing, statistical inference, chi-square analysis, linear regression, correlation and application of the above in making informed, data-driven decisions in real-world contexts. Both graphing calculators and computer-based statistical software (Microsoft® Excel) will be used. If the prerequisite is more than two years old the recommendation is the course placement assessment be taken or the prerequisite be retaken to ensure the success of the student.

Prerequisite(s)

A 2.0 in MAT 033, 131 or higher, or course placement by exam. (Note: Math 039 is NOT an acceptable prerequisite for Math 133)

Course Objectives

Students will be able to:

- Perform a hypothesis test involving means and proportions.
- Create, interpret, and apply graphical displays of data (histograms, bar charts, circle graphs, dot plots, and stem and leaf displays)
- Compute, interpret, and apply descriptive numerical measures (mean, mode, median, range, variance, and standard deviation)
- Compute and apply a linear regression line and Pearson product moment correlation coefficient.
- Compute, interpret, and apply probabilities involving discrete, binomial, normal, and *t*-distributions.
- Compute and apply confidence intervals for means and proportions.
- Use appropriate technology (such as a graphing calculator) to enhance the understanding of previous objectives.
- Knowledge and awareness of statistics in scientific issues and current events

***Math 133 General Education Outcomes*:** The course goals and objectives incorporate specific General Education Outcomes (GEOs) established by the JC Board of Trustees, administration, and faculty. These

goals are in concert with four-year colleges and universities and reflect input from the professional communities we serve. GEOs guarantee students achieve goals necessary for graduation credit, transferability, and professional skills needed in many certification programs. The GEOs and course objective addressed in this class is **GEO 3** – Demonstrate Computational Skills and Mathematical Reasoning.

Required Materials - Part of Access from Bookstore

- MAT 133 **Coursepack** *Fa20 – Sp21*
- ***Textbook:*** *Student Activity Workbook for Statistics: Informed Decisions using Data 6th edition*, Author: Heather Foes et. al., Publisher: Pearson, ISBN-13: 978-0-13-582063-6
- **MyStatLab** ("MSL") Student Access Code (http://www.mystatlab.com) – See Info Sheet on JetNet

Required Materials – Not part of Access from Bookstore

- Computer with **webcam**, **microphone**, and consistent **internet access** (webcam may be external)
- **Scan-to-PDF Technology**: Free mobile apps or stand-alone scanner for submitting PDF files
- 3-Ring Binder, Pencils, Pens, Highlighters, Erasers, Ruler/Straight Edge
- Access to an Internet-connected computer.

Optional Materials – Not part of Access from Bookstore

- **Optional Textbook:** *Statistics: Informed Decisions Using Data 6th edition,* Author: Michael Sullivan III, Publisher: Pearson, ISBN 13: 978-0-123-578018-3 **Textbook Zero:** This textbook is available for free online within MyStatLab and does not need to be purchased separately.
- Dry Erase Markers, Dry Erase Board

Grading Scale

GPA	GRADE RANGE	GRADE CALCULATION
4.0	90-100%	
3.5	85-89%	MyStatLab = 10%
3.0	80-84%	Classwork = 20%
2.5	75-79%	Projects = 20%
2.0	70-74%	Midterm Exam = 25%
1.5	65-69%	Final Exam = 25%
1.0	60-64%	
0.5	55-59%	
0.0	0-54%	

Grading Procedure

Category #1: MyStatLab (MSL) Assignments These assignments (quizzes, homework, etc.) must be done on a computer with internet access at MyStatLab (reachable through http://www.mystatlab.com). Assignments will be given due dates, announced in class. Check MyStatLab and with your instructor for particular due dates.

Category #2: Classwork

- **In-Class Activities & Assignments:** There will be frequent partner and group-based in-class activities and assignments. These may be scored for credit (participation, correctness or both). These may be individual or group assignments, closed or open notes at the instructor's discretion. Students may be able to choose their own partner/group or may have a partner/group assigned by the instructor.
- **Homework:** There will be frequent assignments to be completed outside of class, including worksheets, watching videos, filling out coursepack notes, etc.

Category #3: Projects These activities and worksheets are assigned either from the Student Activity Workbook or in separate sheets posted by the instructor. They may involve groupwork, active participation, working with applets, and working with StatCrunch.

Categories #4 & #5: Midterm & Final Exams The Midterm Exam (Ch 1-6) and Final Exam (Ch 1-11) are proctored, closed-book tests that must be taken while being **monitored via a web camera**. In addition, you may be required to screen-share and/or scan your environment during the exam.

- **Note Sheets:** You will be able to use the "Exam Notes Packet" from the coursepack during both Exams. You may also make pages of notes on 8.5 by 11 paper to use on the exams (2 sheets of paper for the midterm, 4 sheets for the final exam – front and back of sheets is fine)
- **Timing:**
  - You will have the opportunity to take each of these exams during a normal class session, or you can make other arrangements directly with your instructor.
  - The Final Exam is during the last week of the course and cannot be taken early so do NOT schedule travel plans during that week or you will receive a ZERO on the final.
  - Exams not taken by the due date will receive a grade of zero except under extreme, well-documented circumstances arranged ***in advance*** of the due date with the instructor.

Incomplete Policy

A student may request an incomplete from the instructor, who will follow the JC Incomplete Policy. An incomplete may be granted only if the student can provide documentation that his or her work up to that point is sufficient in quality, but lacking in quantity, due to circumstances beyond the student's control. Furthermore, a written plan for making up the missing work within one semester must be completed by the student. Final determination of whether an incomplete will be given is the instructor's decision. Note: An "Incomplete" grade is not a way to avoid a failing one.

Attendance Policy

Just as in a traditional classroom course, regular class participation and keeping up with assignments **is required**. It is my experience that students that regularly attend and participate in synchronous class sessions are significantly more successful in the course. Therefore, students are expected to attend and participate fully in all class meetings, arriving on time and staying until the end.

Participation in the course will require:

1. Regularly showing your face via webcam
2. Talking and working with others (including your instructor) through an online platform (such as Zoom) in both whole class sessions and "breakout" rooms.
3. Contributing to class and group discussions
4. Sharing your screen and/or work with your groupmates and/or the class.

In compliance with Federal Title IV funding requirements, as well as college initiatives, I will be taking and submitting attendance every day of class to assure compliance with college policy and federal regulations. **Missing class may result in you being withdrawn from the course.** Being withdrawn from a course can have an impact on financial aid, billing, athletic eligibility, and housing status. As a college student, you are responsible for how your class attendance and participation may impact your academic progress; the accountability lies with you.

Absence Policy

If absence us unavoidable the student is responsible for doing the following:

1. Contact your instructor regarding your absence as soon as possible to find out what you missed and what you need to do before the next class. (Having a peer contact in the class is very helpful for finding out this information as well!)
2. Watch the recording of class – if available.
3. Turn in all assignments that were given in class as well as those that were due as "homework" on time.

Please remember that student office hours are not a replacement for class time.

Academic Honesty Policy

Academic Honesty is defined as ethical behavior that includes student production of their own work and not representing others' work as their own, by cheating or by helping others to do so.

Plagiarism is defined as the failure to give credit for the use of material from outside sources. Plagiarism includes but is not limited to:

- Submitting other's work as your own
- Using data, illustrations, pictures, quotations, or paraphrases from other sources without adequate documentation
- Reusing significant, identical or nearly identical portions of one's own prior work without acknowledging that one is doing so or without citing this original work (self-plagiarism)

Cheating is defined as obtaining answers/material from an outside source without authorization. Cheating includes, but is not limited to:

- Plagiarizing in any form

- Using notes/books/electronic material without authorization
- Copying
- Submitting others' work as your own or submitting your work for others
- Altering graded work
- Falsifying data
- Exhibiting other behaviors generally considered unethical
- Allowing your work to be submitted by others

Extra Credit Policy

There will be no opportunities for extra credit. Your grade calculation is based solely on your performance on course assignments listed above.

Classroom Behavior Policy

We know what a person thinks not when he tells us what he thinks, but by his actions." **- Issac B. Singer**

We are each responsible for our work, our learning, and the consistency of our performances.

The regular in-class collaborations, online homework, and examinations will require consistent effort on your part. Generally speaking, mathematics is much like a foreign language – it requires regular effort and consistent practice to understand and master.

We are each respectful of everyone in the class (including ourselves).

Please silence mobile phones and other electronic devices, refrain from using any tobacco products, and come prepared (and on time) to work together and ask/answer questions.

We will communicate with each other promptly regarding problems or concerns.

Regular, direct communication solves many more problems than it causes. Please do not hesitate to contact me for any reason, and I will do the same with you.

Caveat

Students are advised that some revisions to this syllabus may be necessary during the course due to school closing policies, instructor illness and other procedural improbabilities.

Accessibility

Jackson College understands that cultivating a broadly diverse community is crucial to our educational mission and to our foundational commitment to leadership and service. Jackson College is fully committed to ensuring our courses are accessible to everyone including those with disabilities. We are currently working to increase accessibility and usability of our course materials in order to meet or exceed the requirements of Section 508 of the Rehabilitation Act of 1973, the Americans with Disabilities Act of 1991 and Web Content Accessibility Guidelines (WCAG) 2.0. For more information about Jackson College's efforts to ensure accessibility please visit the Jackson College accessibility web page.

If you have an accessibility need in any of our classes please e-mail the Center for Student Success at JCCSS@jccmi.edu or visit the Center for Student Success web page.

At the Center for Student Success (CSS), we are committed to providing all students the opportunity to achieve academic success by providing a variety of support services free of charge to Jackson College students. This includes, but is not limited to, peer and faculty tutoring, mental health referral, temporary assistance with transportation, various workshops/seminars, and the TRIO program.

In addition, the CSS staff is committed to adapting the College's general services to meet the individual needs of otherwise qualified students with disabilities, for the purpose of providing equal access to all programs and facilities.

Where to Get Help

Your fellow students and I are your best, most immediate resources for learning. Even so, there are many other sources to consider and investigate. Be creative, be resourceful, and share what you find -- we're all in this together! I strongly suggest you start up a regular study group as soon as you are able with some of your classmates. For more information on starting and maintaining a study group, check out the following link: http://bit.ly/math-study-group

Other sources of help:

- **Office Hours:** Meet with me during office hours.
- **Jackson College's Center for Student Success (CSS):** Free online tutoring in is available at http://www.jccmi.edu/Success/Tutor/.
- **Supplemental Instruction:** Some sections of the course have Supplemental Instruction (SI) Leaders assigned to them. These students will serve as peer "math coaches" for the students in that section, and will facilitate weekly study sessions. These study sessions are open to *all* MAT 133 students and are completely voluntary, but highly recommended. **In a recent semester, students that utilized SI study sessions experienced an increase of over 17% in their pass rates, compared to those who did not.** Even if your section does not have an SI Leader, you are encouraged to attend SI Sessions for your course. For times and locations of SI sessions, go to https://www.jccmi.edu/supplemental-instruction/
- **YouTube Videos:** Lead Faculty Alana Tuckey has created hundreds of videos showing for this course including lectures, calculator tutorials, and more. Go to: http://www.youtube.com/user/tuckeyalanaj and check out any 133 playlists.
- **MyStatLab:** There are videos, extra problems, sample exams, lecture notes, PowerPoint lectures and more available in MyStatLab. It's a great resource! In particular, the **Study Plan** in MyStatLab can help with studying for exams as it gives you unlimited extra problems to do for practice.

Calendar

**Calendar dates are an approximation and are subject to change.*

Day	Topics
	Supplemental Topics Chapter
1	2.1: Organizing Qualitative Data
	2.2: Organizing Quantitative Data
	2.3: Additional Displays of Quantitative Data
	2.4: Graphical Misrepresentations of Data
2	1.1: Introduction to the Practice of Statistics
	3.1: Measures of Central Tendency
3	3.2: Measures of Dispersion
	3.3: Measures of Central Tendency and Dispersion for Grouped Data
4	3.4 & 3.5: Measures of Position, Five-number Summary, Boxplots
5	1.2: Observational Studies versus Designed Experiments
	4.1: Scatter Diagrams; Correlation
6	4.2: Least-Squares Regression
	4.3: Diagnostics on the Least Squares Regression Line
7	5.1: Rules of Probability
8	5.2: The Addition Rule and Complements
9	5.3: Independence and the Multiplication Rule
10	6.1: Discrete Probability Distributions
11	6.2: The Binomial Probability Distribution
12	Review for Midterm Exam
13	Midterm Exam (synchronous session)
14	7.1: Properties of the Normal Distribution
	7.2: Applications of the Normal Distribution
	7.3: Assessing Normality
15	1.3: Simple Random Sampling
	1.4: Other Sampling Methods
	1.5: Bias in Sampling
16	8.1: Distribution of the Sample Mean
17	8.2: Distribution of the Sample Proportion
18	9.1: Confidence Interval for a Population Proportion

19	9.2: Confidence Interval for a Population Mean
20	9.4: Sample Size; More with Confidence Intervals
	Ch 9 Flow Charts for Confidence Intervals and Sample Size
21	10.1: The Language of Hypothesis Testing
22	10.2: Hypothesis Tests for a Population Proportion, p
23	10.3: Testing a Hypothesis about a Mean
	Ch 10 Flow Chart for Hypothesis Testing
24	1.6: The Design of Experiments
	11.1: Inference about Two Population Proportions
25	11.2: Inference about Two Means: Dependent Samples
26	11.3: Inference about Two Means: Independent Samples
	Ch 11 Flow Charts for Confidence Intervals, Sample Size, Hyp. Tests
27	Review for Final Exam
28	Final Exam (synchronous session)

Fall Semester - 2020

Instructor: Sara Main

Office: Zoon Ph: Central Campus Math Dept.

TIME	MON	TUES	WED	THU	FRI
8:00 -8:30am					Office hours by apt. only. Mrs. Main is available by email, text and phone for help.
8:30-9am					
9-9:30am	MAT 130A.I1		MAT 130A.I1		
9:30-10am					
10-10:30am					
10:30-11am					
11– 11:30am	Student Hours		Student Hours		
11:30 – 12pm					
12-12:30pm		Student Hours		Student Hours	
12:30-1pm					
1-1:30pm	MAT 130A.I3	MAT 133.I3	MAT 130A.I3	MAT 133.I3	
1:30-2pm					
2-2:30pm					
2:30-3pm					
3-3:30pm					
3:30-4pm					
4-4:30pm					

4:30-5pm					
5-5:30pm	Student Hours		Student Hours		
5:30-6pm					
6-6:30pm	MAT 133.I51 7-wk		MAT 133.I51 7-wk		
6:30-7pm					
7-7:30pm					
7:30-8pm					