



## Introduction to Probability and Statistics

MAT 133.H72

Semester: Winter 2020

Number of Credits: 4

Contact Phone: (517) 796-8563

Days Class Meets: M/W

Contact Email: [shepherjamiel@jccmi.edu](mailto:shepherjamiel@jccmi.edu)

Meeting Times: 6:00PM – 7:56PM

Office Hours: M-Th 10-11 Main Campus,  
Monday 8-9PM In classroom, Wednesday  
4:30-6PM Room TBD

Location: JC @LISD Tech Rm 227

Instructor: Jamie Shepherd

Online: MyStatLab ID: [shepherd19837](#)

Office: JM 208A

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### 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

- **MAT 133 Course Pack Fall 2019 - Spring 2020**
- **MyStatLab (“MSL”) Student Access Code**
- **TI-84 Calculator** (Note: TI-83s cannot run the newest operating system, which puts students using them at a *significant* disadvantage.)

## Extras

- 3-Ring Binder, Pencils, Pens, Highlighters, Dry Erase Markers, Erasers, Ruler/Straight Edge
- Access to an Internet-connected computer and Microsoft Excel is required for Math 133. Excel-based projects will be assigned and regular class homework must be completed on a computer with Internet access—whether on campus, at home, or elsewhere.
- Students have **free access to Microsoft Office** (see <http://bit.ly/freemso> for more details).
- **Optional Textbook:** *Statistics: Informed Decisions Using Data 5th edition*, Author: Michael Sullivan, III, Publisher: Prentice Hall – **Textbook Zero:** This textbook is available free online within MyStatLab and does not need to be purchased separately.

## Grading Procedure

### Category #1: Classwork & Homework

- **In-Class Activities:** There will be frequent partner and group-based in-class activities. These may be turned in for credit or scored during class (either for participation or correctness). Students may be able to choose their own partner/group or may have a partner/group assigned by the instructor. There are no excused absences; students may *not* make up the missed in-class assignments.
- **In-Class Assignments:** There will be frequent in-class assignments (turned in for credit). These may be individual or group assignments, closed or open notes at the instructor’s discretion. There are no excused absences; students may *not* make up the missed in-class assignments.
- **Homework:** There will be frequent assignments to be completed outside of class, including worksheets, watching videos to fill out notes, etc.

**Category #2: MyStatLab (MSL) Assignments** These assignments (quizzes, homework, videos, etc.) must be done outside of class time 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 #3: Projects** There are two mandatory projects in the course that are designed to improve students' statistical and technological skills and connect course concepts with applications. These are done entirely outside of class and will require the use of a computer, the internet, YouTube, and Excel. You can use school computers to complete the project, if necessary.

**Category #4: Mid-Semester Exams** Due to the nature of the course, every exam will have questions that relate to previous exams. You will be allowed the use of one page (8.5" x 11", front and back) of notes of your own creation (*excluding copies of pages from the course notes*) for each exam.

- Exams may not be made up except under extreme, well-documented circumstances. Final decisions as to whether a make-up exam will be allowed rest solely with the instructor, so contact me immediately if there is a problem. Make-up exams must be arranged before the exam is passed out to the class (i.e. the next class period) or a zero will be given for that exam.
- Due to the condensed nature of our course, exams will be **taken outside of class in the Testing Lab**

**Category #5: Final Exam** Due to the nature of the course, every exam will have questions that relate to previous exams. The final exam is cumulative for the whole course. You will be allowed the use of one page (8.5" x 11", front and back) of notes of your own creation (*excluding copies of pages from the course notes*) for each exam. For the final exam, students will be allowed four pages of notes of their own creation.

- The Final Exam is during the last week of the course and can NOT be taken early so do NOT schedule travel plans during that week or you will receive a ZERO on the final.

## Grading Scale

GPA	GRADE RANGE	GRADE CALCULATION
4.0	90-100%	
3.5	85-89%	Classwork & Homework = 20%
3.0	80-84%	MyStatLab = 10%
2.5	75-79%	Projects (2 @ 5% each) = 10%
2.0	70-74%	Mid-Semester Exams (3 @ 13% each) = 39%
1.5	65-69%	Final Exam = 21%
1.0	60-64%	
0.5	55-59%	
0.0	0-54%	

## Attendance Policy

In compliance with Federal Title IV funding requirements, as well as college initiatives, student attendance will be reported daily. Attendance records are available to students through JetStream. In addition, instructors may assign one of three non-transcribed participation/progress letters to each student during each of the three reporting periods (see below). Students identified as no longer participating will be dropped or administratively withdrawn from the class, and students identified as needing academic assistance will be contacted.

### Participation/Progress Symbols

- H – The student is not doing acceptable work and needs **H**elp to be successful.
- Q – The student has not participated and the instructor believes they have unofficially withdrawn (**Q**uit). These students will be dropped/withdrawn from the class.
- V – The instructor **V**erifies that the student is participating and doing acceptable work.

## 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.

## Absence Policy

Students are expected to attend all class meetings, arriving on time, and staying until the end. We do a variety of in-class activities which cannot be made up outside of class for any reason. Please remember that office hours are not a replacement for class time. If absence is 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. Scan and submit a single PDF file of any homework assignment that is due for that class by the start of class time. I recommend free apps (available for Android and iOS devices) such as CamScanner or GeniusScan.
3. Request and print any new homework handed out in class, and complete them.

## 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.

## 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. At the very least, write down names and contact information for your peers and call on each other when needed. 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 tutoring in 138 Bert Walker Hall is available most weekdays (<http://www.jccmi.edu/Success/Tutor/>). Remember, finding tutoring for upper-level mathematics often takes time and patience.
- **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 class doesn't have an SI Leader, you are encouraged to attend SI Sessions for your course. For times and locations of SI sessions, visit the Center for Student Success webpage and click on "Supplemental Instruction" in the menu or go to (<http://bit.ly/jcsischedule>)
- **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/tuckeyalana> 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.

## [Accommodations for students with disabilities](#)

It is important to contact a Center for Student Success professional prior to the start of the semester in order to receive accommodations in a timely manner. While we will make every effort to coordinate accommodations in a timely manner, failure to self-identify prior to the start of the semester may delay notification to instructors and timeliness of acquiring accommodations. Accommodations do not automatically carry over to the next semester.

Important Dates:

Date	Event
Jan. 13-May. 3, 2020	Semester Dates
Jan.13- Mar 1, 2020	1st 7 week semester class dates
Jan. 31, 2020	In-service Day (no classes)
May 3, 2020	End of Winter Semester
May 5, 2020	Grades Due

## Calendar

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

<b>Math 133 - Tentative Schedule (Exams in Testing Center!)</b>			
Hour	Date	Material Covered	Topics
1	1/13	Syllabus	
2	1/13	1.1 & Ch 2	Introduction to Statistics
3	1/13	1.1 & Ch 2	Introduction to Statistics <b>Ch. 2 MSL Quiz Due 1/17</b>
4	1/13	3.1	Measures of Center
5	1/15	3.2	Measures of Spread
6	1/15	3.2	Measures of Spread
7	1/15	3.3	Weighted Mean
8	1/15	3.3	Weighted Mean
9	1/20	3.4-3.5	Measures of Position; Boxplots
10	1/20	3.4-3.5	Measures of Position; Boxplots <b>Ch. 3 MSL Quiz Due 1/22</b>
11	1/20	1.2	Observational Studies vs. Designed Experiments
12	1/20	4.1	Correlation
13	1/20	4.1	Correlation
14	1/22	Start 4.2	Linear Regression <b>Ch. 4 MSL Quiz Due 1/27</b>
15	1/22	Finish 4.2, 4.3	Linear Regression; Residual Plots & Coefficient of Determination
16	1/22	Review for Exam 1	<b>Exam Window: 1/23-1/28</b>
18	1/27	5.1	Basics of Probability
19	1/27	5.1	Basics of Probability
20	1/27	5.2	Addition Rule

Hour	Date	Material Covered	Topics
21	1/27	5.2	Addition Rule
22	1/27	5.3	Multiplication Rule
23	1/27	5.3	Multiplication Rule <b>Ch. 5 MSL Quiz Due 1/31</b>
24	1/29	Start 6.1	Discrete Probability Distributions
25	1/29	Finish 6.1	Discrete Probability Distributions
26	1/29	Start 6.2	Binomial Distribution
27	1/29	Finish 6.2	Binomial Distribution <b>Ch. 6 MSL Quiz Due 2/3</b>
			<b>Project 1 Due 1/31 by 11:59PM</b>
28	2/3	7.1	Introduction to Normal Distributions
29	2/3	Start 7.2	Normal Distributions <b>Ch. 7 MSL Quiz Due 2/7</b>
30	2/3	Finish 7.2; 7.3	Normal Distributions; Normal Probability Plot
31	2/3	Review for Exam 2	<b>Exam Window: 2/4 – 2/7</b>
33	2/5	1.3, 1.4, 1.5	Sampling Methods; Bias in Sampling
34	2/5	8.1	Sampling Distribution of Sample Means
35	2/5	8.2	Sampling Distribution of Proportions <b>Ch. 8 MSL Quiz Due 2/10</b>
36	2/5	9.1	Confidence Intervals for Proportions
37	2/5	9.1	Confidence Intervals for Proportions
38	2/10	9.2	Confidence Intervals for Means
39	2/10	9.2	Confidence Intervals for Means
40	2/10	9.4	More with Confidence Intervals
41	2/10	9.4	More with Confidence Intervals
42	2/10	9.5	Review of Chapter 9 <b>Ch. 9 MSL Quiz Due 2/15</b>
43	2/12	10.1	Basics of Hypothesis Testing
44	2/12	10.1	Basics of Hypothesis Testing
45	2/12	10.2	Hypothesis testing with Proportions
46	2/12	10.2	Hypothesis testing with Proportions
47	2/17	10.3	Hypothesis testing with Means
48	2/17	10.3	Hypothesis testing with Means
49	2/17	10.5	Review of Chapter 10 <b>Ch. 10 MSL Quiz Due 2/21</b>
50	2/17	Review for Exam 3	<b>Exam Window: 2/18-2/21</b>



Hour	Date	Material Covered	Topics
52	2/19	1.6, Start 11.1	Hypothesis testing for Difference of Proportions
53	2/19	Finish 11.1	Hypothesis testing for Difference of Proportions
54	2/19	11.2	Hypothesis testing for Difference of Means - Dependent Samples
55	2/24	11.3	Hypothesis testing for Difference of Means - Independent Samples
56	2/24	11.5	Review of Chapter 11 <b>Ch. 11 MSL Quiz Due 2/26</b>
			<b>Project 2 Due 2/24 beginning of class!</b>
57	2/26	Review for Final	<b>Final Exam Window 2/25 – 2/28</b>