

MAT 033.72 – Algebra for Statistics

Course Syllabus (Winter 2017)

Instructor: Terry L. Cox

Office: Room 207 JC-LISD

Contact: coxterryl@jccmi.edu and 734-649-7306

MyStatLab: <http://mystatlab.com> (Course ID: cox14898)
Access Code: WMSLSS-NANDA-LOACH-PYRAN-TUBBY-FFLSE

Class Time & Location: Room 220 M&W 3:30 to 5:48

Required Materials:

MAT 033 Course Pack Fall 2016 - Spring 2017 (waiting for you at the JC Bookstore) & 3-hole binder
MyStatLab (“MSL”) Student Access Code (included in your course fees)

TI-84 Calculator (Note: TI-83s cannot run the newest operating system, which puts students using them at a *significant* disadvantage in 033 and 133, so all notes and instructions presume a TI-84.)

Please note:

- ✓ Access to an Internet-connected computer and Microsoft Excel is required for Math 033. Multiple 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).
- ✓ There is no “textbook” for this course, aside from the course pack. The probability and statistics portions of the course are based on Sullivan’s 4th Edition of *Statistics: Informed Decisions Using Data*. Purchasing this text is unnecessary, as your MyStatLab access provides electronic access to the entire text.
- ✓ Your access to MyStatLab is part of your fees for this course, and it *can also be used* for the MAT 133 course (the required follow-up to MAT 033)!

Strongly Suggested Materials: multi-colored highlighters, pencils, eraser, ruler, sticky notes

Course Description: As an alternative pathway to college-level mathematics, this course introduces fundamental algebraic concepts within an underlying framework of statistics and mathematical modeling based on real-world data. Major concepts and themes include: problem solving and experimental design; unit analysis and error in measurement; dimensional analysis and scientific notation; representing data and coordinate graphing; introduction to basic descriptive statistics and probability theorems; basic geometric principles (area, volume, perimeter); arithmetic operations on numbers, ratios, summations, and percent; solution of formulas; modeling relationships (linear regression); solving equations and inequalities; and function arithmetic and graphing. Appropriate technology includes a graphing calculator.

Prerequisite: A 2.0 in MAT 030 within 2 years, or course placement by exam.

Course Requirements:

Core Course Objectives: Students successfully completing MAT 033 will be able to...

1. Create, interpret, and apply graphical displays of data (histograms, bar & pie charts, dot plots, and stem & leaf displays).
2. Compute, interpret, and apply descriptive measures (mean, mode, median, range, variance, and standard deviation).
3. Use algebraic processes to manipulate formulas, simplify basic algebraic expressions and solve linear equations and inequalities.
4. Demonstrate understanding of functions, independent and dependent variables, number theory, sets, and mathematical notation.
5. Demonstrate understanding of concepts of equations by finding and interpreting appropriate graphs, x- and y-intercepts, and specific function characteristics.
6. Generate and interpret regression models to fit data.
7. Make, interpret, and compute with measurements in scientific notation.
8. Use appropriate technology (i.e., graphing calculator) to enhance understanding of objectives.
9. Demonstrate knowledge and awareness of statistics in scientific arguments and current events.

Online Homework:

- These assignments must be done outside of class time on a computer with Internet access at **MyStatLab** (reachable through <http://www.mystatlab.com>).
- Homework due dates are listed on the MyStatLab course.

In-Class Work, Quizzes, etc.: There may be in-class work submitted in class (turned in for credit). These may be individual or group assignments, closed or open notes at the instructor's discretion. There may also be additional quizzes posted on MyStatLab for students to take outside of class.

Projects: There will be three *required* projects for this course that expand on concepts covered and require students to use real-world data and tools (Microsoft Excel computer software). One will involve unit analysis and real-world applications. Another will involve collecting and analyzing quantitative data, while the last will involve collecting and analyzing qualitative data. These projects are required of all students taking the course.

Exams: Each of the three exams may have cumulative review questions. The final exam is cumulative for the entire course. Students may create a 1-page (both sides) note sheet for use on each exam, and all previous exam note sheets may be used on the final exam. Exams **may not be made up** except under previously arranged, well-documented, unavoidable circumstances (ultimate determination made by the instructor). Any such make-up exams must be completed before the next class period or a zero will be given for that exam.

NOTE: The final exam takes place during the *last week* of the course and CANNOT be taken early.

Important Dates: Be sure to visit the JC Academic Calendar to note Holidays or other special days with no classes at <https://www.jccmi.edu/academics/academic-calendar/>. Also note drop and withdrawal dates: <https://www.jccmi.edu/registration-records/canceled-classes-drops-and-withdrawals/>

Course Policies:

Absence Policy: Students are expected to attend all class meetings, arriving on time, and staying until the end. A variety of in-class activities involve other students and group participation, as well as handouts. If absence is unavoidable the student is responsible for obtaining any missed lecture notes and assignments from another student, or from the instructor. Please remember that office hours are not a replacement for class time.

Grading Information: A 2.0 or "C" is a passing grade. Only courses with passing grades count toward graduation. Other colleges transfer in only courses with passing grades. Many financial aid sources, including most employers, require passing grades. Additionally, earning less than a 2.0 in this class will result in you being unable to participate in the next course in the sequence (MAT 133). This will prevent access to any further programs of study and completion of any associate's degree.

Grading Scale:

90 – 100%	4.0
85 – 89%	3.5
80 – 84%	3.0
75 – 79%	2.5
70 – 74%	2.0
65 – 69%	1.5
60 – 64%	1.0
55 – 59%	0.5
0 – 55%	0.0

Grading Weights:

MyStatLab Work: 15%
In-Class Work/worksheets: 15%
Exam 1 (<i>Unit 1</i>): 10%
Exam 2 (<i>Units 2-3</i>): 15%
Exam 3 (<i>Units 4-5</i>): 10%
All Three Projects: 15%
Cumulative Final Exam (<i>Units 1-7</i>): 20%

Intermediate Grading: To comply with college policy and federal regulations you will receive three intermediate grades during the semester. The grades assigned are letters with the following meanings:

- **V: Verifies** that you are participating and your work so far has been acceptable
- **H:** You may require **Help** in order to complete the class successfully. If you receive an H grade, you will be contacted by the Center for Student Success (located in Potter Center, Federer Room C) and offered tutoring services.
- **Q:** Means that you **Quit** participating in the course. If you receive a Q grade, you will automatically be withdrawn from the course. A Q grade is normally assigned if you have not submitted work (classwork, exams, participation, etc.) for two weeks and have not contacted your instructor regarding your absences.

Extra Credit: Math Department policy is that no "extra credit" be part of any MAT course at JC. There will be no opportunities for any *extra* credit beyond the scope of the above requirements.

Incomplete Policy: (Excerpt from JC Policy) “Students may receive an “I” if, at least 90 percent (or as otherwise designated within the course syllabus), of the coursework is completed with an average grade of 2.0 to meet the objectives as specified in the course syllabus. ... The grade of “I” is not awarded to students who did not attend, or seldom attended, or to those who simply are not pleased with their final grades.” <https://www.jccmi.edu/wp-content/uploads/2015/11/1003.pdf>

Academic Honesty Policy: You are *encouraged* to talk to each other, but all your submitted work must demonstrate your own understanding. In other words, "group-work" is a great way to learn material, but anything you submit for a grade must be done by you – reflecting your own thought processes, not those of anyone else. If I suspect you of academic dishonesty, I will follow JC's Academic Honesty Policy and take appropriate action up to and including assigning a **failing grade** for the assignment, quiz, project, report, exam, or the course itself (whichever I deem necessary). The policy can be seen here: <https://www.jccmi.edu/wp-content/uploads/1004.pdf>

Classroom Behavior Policy: *The following are expectations that we can all share.*

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.

Getting Help

Office Hours: Office hours are there for you to get help with topics on which you have already worked. Please attend if you need questions answered. Remember, though, that office hours are not a replacement for attending class.

Center for Student Success: The Center for Student Success has tutoring available for free to students enrolled in Math 033. You can get help with take-home work, MyStatLab homework, and more. The Center is located on the first floor of Bert Walker Hal (on Central Campus), or through the front desk at the other center locations. *BE AWARE that not all tutors have experience with statistics!*

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 033 students and are completely voluntary. For times and locations of SI sessions, visit the Center for Student Success webpage and click on “Supplemental Instruction” in the menu (<https://www.jccmi.edu/center-for-student-success/>).

You Tube Videos: A number of videos showing how to use the TI-84 calculator (and other things) are posted to YouTube: <http://www.youtube.com/user/jccmat033>. Feel free to request others, if topics are of interest to you. Of course, there are MANY online resources out there – the trick is finding some that are *helpful* and of *high quality*.

MyStatLab: There are videos, extra problems, sample exams, lectures, PowerPoint slides and more available in MyStatLab. It’s a great resource, but only useful if you explore and try it out! Also, be aware that there are vast amounts of help available to you, as a MyStatLab user (<http://www.pearsonmylabandmastering.com/northamerica/mystatlab/students/support/>).

Each Other: Your fellow classmates are perhaps the single best resource you have. Get to know each other, write down names and numbers for your peers, and rely on each other! **Starting a study group** is probably the **best way** to maintain your studies and improve your learning. For more information on starting a study group for math, visit: <http://bit.ly/math-study-group>

MAT 033 Course Calendar Winter 2017

Date	Day	Topic #	Topic Heading	Course Pack pg.
Unit 1: Numbers, Operations, Formulas, & Units				1-42
6-Feb		1 ---	Go over syllabus, MML, course requirements	--
		1	Classification of Numbers	1
		2	Roman Numeral Refresher	4
		3	Variables and Constants	5
		4	Expressions	6
		5	Algebraic Language	7
		6	Change in a Quantity as Subtraction	9
		7	Multiplying, Dividing, and Unit Ratios of Real Numbers	10
		8	Exponents and Square Roots	11
8-Feb	2	9	Order of Operations	14
		10	The Laws of Arithmetic	16
		11	Simplifying Expressions	19
		12	Using Formulas	21
		13	Manipulating & Solving Formulas	25
13-Feb	3	14	Understanding Inequalities	28
		15	Interpreting Margin of Error & Intervals	31
		16	Converting Units	32
15-Feb	4	17	Medical Unit Conversions	40
			Exam 1 Review (Unit 1)	
20-Feb	5		Exam 1 (Unit 1)	
Unit 2: Statistical Data Collection				43 - 71
22-Feb	6	1	Introduction to the Practice of Statistics	43
		2	The Process of Statistics	44
		3	Types of Statistical Variables	49
		4	Levels of Measurement	52
6-Mar	7	5	Observational Studies and Designed Experiments	55
		6	Simple Random Sampling	58
		7	Other Effective Sampling Methods	61
		8	Bias in Sampling	65
8-Mar	8	9	The Design of Experiments	68
Unit 3: Fractions and Probability				72 - 112
		--	Exploratory Discussion	72
		1	Fractions, Ratios, & Rounding	73
		2	Percents & Other Rates	76
13-Mar	9	3	Language of Probability	80
		4	Expected Value & Multiplication Rule of Counting	85
		5	Empirical & Subjective Probability	90
15-Mar	10	6	Review of Operations With Fractions	95
		7	The Addition Rule	98
20-Mar	11	8	The Compliment Rule	102
		9	Scientific Notation	105

22-Mar	12	10	The Multiplication Rule	108
			Exam 2 Review (Units 2 & 3)	
27-Mar	13		Exam 2 (Units 2 & 3)	
Unit 4: Exact Linear Relationships				113 - 142
Date	Day	Topic #	Topic Heading	Course Pack pg.
29-Mar	14	--	Introductory Discussion	113
		1	Scattergrams	114
		2	Exact Linear Relationships	118
		3	Graphing Equations of the Form $y = mx + b$	123
3-Apr	15	4	Graphing Linear Models	128
		5	Slope of a Line	130
		6	Using the Slope to Graph Linear Equations	132
		7	Rate of Change	136
5-Apr	16	8	Graphing Linear Equations	137
		9	Finding Linear Equations	140
Unit 5: Correlation and Approximate Linear Models				143 - 161
		1	Entering Data and Creating Scatter Diagrams	143
10-Apr	17	2	Correlation	145
		3	Approximate Linear Models	152
		4	Regression Equations & Linear Modeling	155
			Exam 3 Review (Units 4 & 5)	
12-Apr	18		Exam 3 (Units 4 & 5)	
Unit 6: Frequency Distributions & Graphical Displays				162 - 190
17-Apr	19	1	Organizing Qualitative Data	162
		2	Organizing Quantitative, Discrete Data	170
		3	Organizing Quantitative, Continuous Data	173
19-Apr	20	4	Shapes of Data Distributions	179
		5	Other Quantitative Displays	181
		6	Misleading Graphs and Misrepresenting Data	186
Unit 7: Summarizing Data Numerically				191 - 222
		1	Sigma Notation and Average	191
24-Apr	21	2	Measures of Central Tendency	200
		3	Measures of Variation	205
26-Apr	22	4	Measures of Central Tendency from Grouped Data	208
		5	Measures of Position and Outliers	211
		6	The Five-Number Summary and Boxplots	218
1-May	23		Final Exam Review	
3-May	24		Final Exam (All chapters)	