

Spring 2019 Course Syllabus

Math 103 — Elementary Statistics

Professor Tim Busken

Contact Info: tbusken@miracosta.edu

Office Hours: before class and by appt.

Section #1117, 4 units

The class meets on Mon. &

Wed. at the Oceanside Campus

in Rm 3509 from 9 - 10:50 am,

Instead of starting with all the information about the course, I felt it would be good to give you some background into the course. This semester, you will see statistics in action through relevant, thoughtful questions in a collaborative space. Statistics is about learning from data and the role variability plays in drawing conclusions from data. This course will give you the opportunity to master the computational aspects of descriptive and inferential statistics, and develop an understanding of the data analysis process at the conceptual level.

You should ask questions often and see your classmates as resources. As your teacher, I will work to give you an excellent experience by modeling our classroom after a work environment in how we work, interact, contribute, learn and collaborate. Even if you don't become a mathematician or statistician one day, what you learn in this class has application at your current or future workplace.

In this class, we will be:

- reading and discussing ideas
- analyzing ideas and solving problems
- sharing and interpreting knowledge

All of these will take place in a classroom culture of security, safety, and curiosity. Mistakes will happen, and these should be celebrated as a huge part of the learning process. It is through mistakes that we can modify our thought process and enact positive change. Thomas Edison worked to make a viable commercial bulb and it took an incredible number of attempts. As an inventor, he made 1,000 unsuccessful attempts at inventing the light bulb. When a reporter asked, "How did it feel to fail 1,000 times?" Edison replied, "I didn't fail 1,000 times. The light bulb was an invention with 1,000 steps." He also said his efforts were not failures – "I just kept finding ways that didn't work."

Turns out, there was someone behind his commercial success: Lewis Latimer, an African American inventor who collaborated with Thomas Edison, invented the carbon filament which was critical for the commercial reliability of the light bulb.

We are on a journey together and this course is an invitation to learn new things. I hope to learn a lot about you in the next few months and I hope that you'll take the chance to learn a lot about how statistics can have a positive impact on your life. Learning new things can be a struggle and we will overcome this with honesty about what we know or don't know, hard work and perseverance, and mostly togetherness as a math community.



Math 103 - Elementary Statistics

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Office Hours: by appointment.

Part of your first day homework will be to write an essay, between 400-500 words that introduces yourself and shares your experiences and strengths. Also explain what you want me to know about you. I will show you how to turn in your essay, using canvas, in the next class.

Another part will be to bring an inspirational quote. An example would be the following:

What does this quote mean to you, especially related to a math class?

Do not let what you cannot do interfere with what you can do.
- John Wooden

You have all been in classes where half the students drop and other classes where almost no one drops. Discuss with 1-2 neighbors:

- What happens inside the class that contributes to this?
- What happens outside the class that contributes to this?
- How does the student/teacher and student/student relationship contribute?

Class Culture and the Learning Process:

We built this class on the belief that everyone has the capability to learn mathematics. How we act as individuals and as a class will be the key to accomplishing our goals successfully. With this in mind, we have the following rules:

- **Treat our time with respect.** We have a short amount of time together, so be ready to learn when class starts. This means coming to class early to settle your mind for learning, putting away your cell phone, and staying engaged until class is finished.
- **Approach your classmates with kindness and encouragement.** Creating a successful class means being able to rely on those around us when we are in need. Be the type of person you would like to turn to when you are in need of help.
- **Struggle productively.** My goal is to give you what you need to make an attempt at each homework problem, but I also don't expect that you will always be able to do all of your homework successfully. I want you to work hard, but I also want you to work productively. If you find yourself spending a lot of time without making any progress, contact me. A small bit of direction can make a world of difference.
- **Learning is a process.** The class is set up to have some learning and doing in class, and at a pace that will challenge but not overwhelm you. It's my job to provide you with just the right amount of work and your job to do that work in a good faith way.



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One of the goals of this class is to push students to get to the higher levels of knowledge as they prepare to continue in mathematics. This means students must begin to reflect on how they learn math. What things have you done in your life and how will those lessons help you in this course:

What expectations do you have of yourself for this class? Of me as the instructor, of each other as colleagues, of the classroom in general?

Self	Professor Busken	Each Other	Classroom

*Tell me and I forget
Teach me and I remember
Involve me and I learn.*

Benjamin Franklin

I want to help you learn what you need to pass the course this term. Be committed to your goal! The following are key parts of my teaching philosophy and illustrate my pedagogical perspective.

- Teaching is more than telling; learning is more than listening.
- Memorization is what we resort to when what we are learning makes no sense. Push yourself to memorize as little as possible and understand as much as possible.

Accommodation of Disability: If you have a hidden or visible disability, which may require classroom or test accommodations, please see me as soon as possible during a scheduled office hour. If you have not already done so, please register with Disabled Students Programs & Services (DSPS) at 760.795.6658. Their office is located on the Oceanside campus in Building 3000, adjacent to parking lot 3C.

Course Description: This course introduces data analysis. Topics include data collection, descriptive statistics, probability, sampling, estimation, significance testing, and correlation and regression. Students use appropriate technology to analyze real-world data.

Course Objectives: At the end of this course you should be able to

1. Design a simple statistical experiment
2. Give an appropriate descriptive summary, including the shape, center, spread, and outliers of the distribution, from a set of raw data
3. Analyze the relationship between two variables using the scatterplot, correlation coefficient, and least-squares regression line
4. Use the normal distribution to find approximate solutions to problems about sample means and sample proportions
5. Compute and interpret confidence intervals for population means and proportions for one- and two-sample problems
6. Formulate and carry out significance tests of population means and proportions for one- and two-sample problems
7. Use the Chi-square test to analyze goodness-of-fit, contingency tables and ANOVA
8. Analyze real-world data using appropriate technology

Student Learning Outcomes:

1. Give an appropriate descriptive summary, including the shape, center, spread and outliers of the distribution, from a set of raw data.
2. Analyze the relationship between two variables using the scatterplot, correlation coefficient, and the least squares regression line.
3. Student will be able to use the normal distribution to find approximate solutions to problems about sample means and sample proportions.

2 Required Materials:

1. the textbook (physical or digital copy)
2. statcrunch spreadsheet software \$13
How to get it: statcrunch.com/get-access/

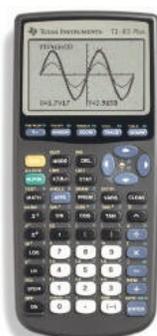
3 Course Websites:

1. MiraCosta's Canvas (online gradebook, calendar and test keys):
miracosta.edu/instruction/distancededucation/index.html
2. My Website (Lab info, practice tests and additional student resources):
timbusken.com/statistics.html
3. Statcrunch Website (spreadsheet software): statcrunch.com

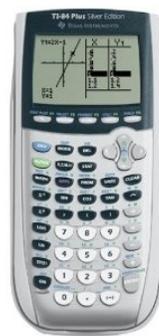
Textbook: Elementary Statistics 6e, Larson and Farber
ISBN: 9780321911216 , Publisher: Pearson.
This course covers Chapters 1 – 10



You will need a physical or digital copy of the textbook for homework and reading assignments. You will NOT need a textbook that has a cd or matlab access code/card.



TI-83 plus



TI-84 plus

Calculator: Required calculator will be provided at no cost for the classroom use. The calculators are also available for free on-campus use at the Math Learning Centers at all college sites. However, if you are going to purchase or rent a calculator for this course, the Math department recommends the Texas Instruments TI-83 plus or TI-84 plus.

Free Online Calculator: You may want to use this free online TI-83+ calculator outside of the classroom. <https://sites.google.com/site/ti83interactivecalculator> (only works on Windows)

<u>Grading:</u>	Labs	20% (roughly 10 labs)
	Test 1	20% (Chapters 1 and 2)
	Test 2	20% (Chapters 4, 5 and 9)
	Test 3	20% (Chapters 6 and 7)
	Final Exam	20% (Chapters 8 and 10)

Numerical course grades are rounded to the nearest whole percentage and translate to a letter grade.
A= 90%-100% B=80%-89% C=70%-79% D=60%-69% F=0%-64%

Online Gradebook: The online gradebook is available when you login to MiraCosta's 'Canvas'

Course Calendar: The course calendar is on the 'Canvas' website. Lab due dates and scheduled test dates can be found on the calendar. These due dates and test dates are tentative and could change.

Labs are worth 20% of your overall grade. There will be roughly 10 or so labs. The main purpose of these labs is to teach you the procedures for using both statistical and spreadsheet software and the TI83/84 calculator for performing computations and obtaining graphs and tables. Labs are due at the beginning of class on the due date. Late labs will likely not be accepted. *I will drop your lowest lab score.*

Homework: The list of homework problems is given on my website. I will not collect your homework but you need to do the assigned problems after every class to help you prepare for tests and keep up with new concepts. You will be completing the homework on paper from out of the textbook. I recommend doing this in the tutoring center so that you can get immediate help if you need it. I assigned mostly odd-numbered problems so that you can check your answers in the back of the book, which you should do. If your answers are not matching up with those given in the back of the book, we need to find out why. When this happens, get help from the tutoring center, a classmate, or ask me for assistance.

Tests: There will be 3 tests worth 20% each and a final exam worth 20%. Practice tests are located on my website (timbusken.com/statistics.html): click on 'SITEMAP' then click on 'PRACTICE TESTS.' If for any reason, you must miss class on the day of a quiz or exam, you must make arrangements with me *in advance* for taking the test at some other time. I may ask you to provide documentation supporting why you are unable to take the exam.

Formula Sheet for Tests: You are allowed to make and use a formula sheet for each test. This formula sheet may only occupy one side of one sheet of a regular size (8.5 in by 11 in.) piece of paper. Worked example problems are not allowed! Only formulas, definitions and procedural comments (a list of steps required to carry out a multi-step process or calculation) are allowed. If you have a question about what is allowed on the formula sheet, please ask me before the test. During the time you spend working on homework and practice tests, please be thinking about what you will need to have on that sheet and write it down. I would encourage you to not wait until the last minute to make your formula sheet.

Extra Credit: The extra credit percent you earn is added to your lowest test score at the end of the semester (but not the final exam). There are two labs that are extra credit. You can find links to the labs on my website (timbusken.com/statistics.html) by clicking on SITEMAP button then clicking 'Labs.' Each lab is worth up to 5% of a test score. For example, if you do one lab and get a 100%, I add 5% to your lowest test score. If you do two labs and get a 100% on both labs, I add 10% to your lowest test score. ***The extra credit labs are due on the day of the final,*** but you should ask me questions about the labs before the final. I will not grade the extra credit until after I have graded finals. Don't wait until the last minute to start the extra credit labs, because you'll

need that time to prepare for the final exam, or for getting much needed rest.

Add/Drop Dates:

- Feb. 3 (Sun), 2019 - Last day to add full-term classes with instructor permission
- Feb. 22 (Fri), 2019 - 30% Pass/No Pass (P/NP) deadline for full-term classes
- Apr. 25 (Thu), 2019 - 75% Withdrawal (W) deadline for full-term classes

Holiday Closures:

1. Mon., Feb. 18th, 2019 - Campus Closed - Washington Day
2. Mar. 18 – 23 - Campus Closed - Spring Break

Attendance Policy: Grades are not based on attendance, but attending class, arriving on time, being prepared with questions, and staying for the entire class are critical for student success. During the first week of class, if you are not present at any time during any class meeting you may be dropped

Cheating Policy:

Violations of the academic dishonesty policy will be treated quickly and harshly. A student found in violation may receive a failing grade on that assignment or test, and will have this infraction reported to the college. I do not tolerate academic dishonesty in any form. MiraCosta College requires reporting of ALL instances of academic dishonesty as Academic Integrity Violations. These include:

- looking at another person's exam during a testing situation
- copying another student's lab and submitting it as your own
- bringing in and using notes or supplemental materials that are allowed
- allowing another student to copy your work and submit it – you will be punished exactly the same as the person who did the copying. To avoid this, don't give your work to someone else. Working together means sharing ideas and discussing concepts, and is acceptable; each student must independently write their own solutions and responses.

Academic Integrity: Students are expected to conduct themselves in accordance with MiraCosta's *Standards of Student Conduct* (Board Policy 5500). Disruptive behavior, threats, harassment, willful disobedience, cheating, plagiarism, or other forms of academic dishonesty are not acceptable and will not be tolerated. Students are expected to conduct themselves in an ethical manner that promotes a safe and harmonious learning environment while on the campus. Charges of misconduct and disciplinary sanctions may be imposed upon those who violate these standards of conduct, or provisions of college regulations. When a violation of the *Standards of Student Conduct* occurs, Board Policy 5520: *Student Discipline Procedures* will be followed.

- ***Standards of Student Conduct***

<http://miracosta.edu/officeofthepresident/board/downloads/5500AP-StandardsofStudentConduct.pdf>

- ***Student Discipline Procedures***

<http://miracosta.edu/officeofthepresident/board/downloads/5520AP-StudentDisciplineProcedures>

-Effective5-5-09Amended9-20-11-1-24-12-RefUpdate4-15.pdf

Grade/Repeating Course Issue: The state has decided to limit students with more than 3 grades of D, F, NP, or W. Grades prior to summer 2012 will be included in the count. You need to be extremely careful with these and make the big decision about dropping the course very early (see the drop deadline). If not, and you get a third non-passing grade, you may not be able to register for the course again.

Drop Policy: If you decide to drop the course, use SURF to drop yourself. Don't wait for me to drop you automatically. If I drop you and you want to be reinstated, see me quickly.

OUTLINE OF COURSE CONTENT

The course will address the following topics:

I. Data collection

- A. Observational studies
- B. Controlled experiments.

II. Descriptive statistics

- A. Exploratory data analysis
- B. Shape of a distribution-frequency tables and graphs
- C. Center of a distribution
- D. Spread of a distribution
- E. Outliers
- F. Empirical rule, standard scores, and percentiles.

III. Probability

- A. Language of probability
- B. Probability distributions and random variables
- C. Binomial distribution
- D. Normal distribution.

IV. Sampling

- A. Types of sampling
- B. Simulation of random samples
- C. Distributions of sample mean and sample proportion
- D. Central limit theorem.

V. Estimation

- A. Confidence intervals for single population proportion
- B. Confidence intervals for single population mean.

VI. Significance testing

- A. Tests of single population proportion
- B. Tests of single population mean.

VII. Inferences for two populations

- A. Comparing two population proportions
- B. Comparing two population means
 - 1. Paired samples
 - 2. Independent samples.

VIII. Correlation and regression

- A. Scatterplots
- B. Correlation
- C. Linear regression.

IX. Non-parametric methods

- A. Chi-square goodness-of-fit test
- B. Analysis of two-way contingency tables
- C. Analysis of Variance

X. Technology use for real-world data analysis

- A. Data collection
- B. Data analysis
- C. Statistical inference.

Student Services, Spring 2019

Math Learning Center: The MLC is open to all math students at MiraCosta. Services include drop-in tutoring, 1:1 appointment for all students with extended time for DSPS students, computerized tutorials, and homework help. Calculators, textbooks, whiteboards, and headphones are available for use in the MLC. While all services are available at OC and SAN, there are some reductions at the CLC due to space limitations.

<http://www.miracosta.edu/instruction/mathematics/mlc/index.html>

Oceanside: BLDG. 1200
Phone number: (760)757-2121 x 6381

M – TH: 8:00 am – 9:00 pm
Friday: 8:00 am – 3:00 pm
Saturday: 10:00 am-5:00 pm
Sunday: Closed

San Elijo: BLDG. 100 Phone
number: (760)757-2121 x 7781

M – TH: 9:00 am – 8:00 pm
Friday: 9:00 am – 3:00 pm
Saturday/Sunday: Closed

Community Learning Center: Room 136 Phone
number: (760)757-2121 x 8843

M – F: 8 am – 1 pm
Saturday/Sunday: Closed

Nordson STEM Center:

The STEM Center is located on the Oceanside campus and supports all students in STEM courses. The STEM Center offers free Drop-In Tutoring for many courses in biology, biotechnology, chemistry, physics, and physical science. The STEM Center also hosts Drop-In Counseling hours, group study rooms (reserve online), laptops, molecular models, and many textbooks for STEM Center usage. Many STEM Workshops are offered to help students succeed in their STEM courses and explore career/job opportunities in STEM related fields.

Location: OC 1200, SAN 105

Phone number: 760.757.2121, x6388 (OC) or x7748 (SAN)

Oceanside hours: M-Th: 9am - 7pm; Fri: 9am - 3pm; Sat 10am – 5pm.

San Elijo hours: M-Th 10am – 6:30pm, Fri: 10am – 3pm.

<http://www.miracosta.edu/student-services/stem/index.html>

Online Academic Support Resources for ALL Students

[Online tutoring](#), [online writing center](#), and the [24x7 online ask-a-librarian service](#). These services are open to all MiraCosta students in any class!

Disabled Students: If you have a disability, you are encouraged to contact Disabled Students Programs & Services at 795-6658. Their office is located in Building 3000, adjacent to Parking lot 3C. They will help you determine what assistance is available for you. Any student requiring special assistance due to a disability must discuss what is needed with me by the second week of semester. <http://www.miracosta.edu/student-services/dsps/index.html>

AB 540 & DACA Students: Access information about resources for AB 540, DACA, Undocumented and Mixed Status Students such as application procedures and the on-campus UndocuAlly program. <https://www.miracosta.edu/student-services/admissions/ab540.html>

CARE: Our focus is to create a culture of care for our students and you will find many resources available on the CARE website at www.miracosta.edu/care

LGBTQIA Safe Space Program: MiraCosta College has an expressed commitment to equity and inclusion for students, faculty, and staff members who are lesbian, gay, bisexual, transgender, queer, questioning, intersex, and asexual. The district employs a Campus Liaison for LGBTQIA+ Needs, offers [LGBTQIA Safe Space](#) training, and has multiple student scholarships for members and active allies of the LGBTQIA+ community. For information about these and additional campus resources and services contact the campus liaison for LGBTQI needs at 760-795-6460.

Veteran Services: The Veterans Education Office, located in Building 3300, provides assistance to veterans and dependents wishing to use their educational benefits at MiraCosta College. The Veterans Information Center, located in Building T-100, provides a place for students to find resources on VA educational benefits, MiraCosta Student Services, and community organizations that are dedicated to assisting veterans. The center also provides a place for students to relax, study, and meet with friends. The Veteran Peer Advisors are also available. Resources are available on a variety of issues, including employment, counseling, housing, and healthcare.

Oceanside Campus <http://www.miracosta.edu/student-services/veterans-services/index.html>
3300 Building: P 760.757.2121 x6285 T100 Building: P 760.757.2121 x6981

Counseling Services: The Counseling Center offers individualized academic, career, and personal counseling to assist both prospective and current students in developing their educational programs, coordinating their career and academic goals, and understanding graduation, major, certificate, and transfer requirements. Students can use online resources (<http://www.miracosta.cc.ca.us/student-services/counseling/index.html>) for general questions and visit or call the office for appointments and drop-in times:

Oceanside Campus

Building 3700 (Parking lot 3C)

Phone: 760-795-6670

Fax: 760-795-6663

San Elijo Campus

Administration Building

Phone: 760-634-7811

Fax: 760-634-7875

Wonderful, Free, Available Resources:

There are many free resources available for you on campus to assist you with your education:

- [Food pantry](#)
- [Health Services](#)
- [Textbook loan program](#)

Wonderful, Supportive Clubs and/or Organizations: Joining a [club](#) or organization is a fun and instrumental part of your college education. Here are some of the clubs and organizations to check out:

- [Puente](#)
- [Umoja](#)
- [RAFFY](#) (Former Foster Youth)
- and many more

How To Study Mathematics and be a Great Student:

- **Attend Class.** Sometimes life will present challenges that are clearly more important than Math 102. Do your best to attend each class session even though attendance is not a direct part of your grade; your classmates are a great resource to let you know what was covered and any tips.
- **Read the text.** Before you come to class read over the textbook sections that will be discussed that day. Mathematics requires active processing of the information after each paragraph or two. Ask yourself questions about what you have read. The textbook is a tool that can enhance your learning; even if you don't like the way it is written you can still learn from it.
- **Do the homework with others.** Before doing the homework try to read the book again (at least skim the section) to pick up major concepts which are covered. Review the notes and examples from class. It is best to attempt the homework as soon as possible after class. Study a little each day rather than "cramming" and do not immediately give up if you reach a problem that you cannot solve quickly... remember it's productive struggle!
- **Prepare for the tests.** Study concepts rather than specific problems. Remember, you will not see the exact problem from the homework on a test, but the same concepts will be tested.
- **Seek conceptual understanding.** If you don't understand a concept, ask questions until it becomes clearer. I will do my best to explain things in different ways until the concept is grasped. If you don't seem to be "getting it", ask me to explain it a different way or to do another example.
- **Keep a positive attitude:** Maybe you haven't always had the best experiences with mathematics, but give this class a chance. I may not be like many other instructors in your past and if you maintain the positive attitude – even if the course becomes challenging – it gives you a better chance to master these concepts. One way to help is to practice positive self-talk.

YOU WILL NEVER
ALWAYS BE
MOTIVATED, SO
YOU MUST LEARN
TO BE
DISCIPLINED.

<i>Reactive (Negative) Language</i>	<i>Proactive (Positive) Language</i>
I'll try.	I'll do it.
That's just the way I am.	I can do better than that.
I have to.	I choose to.
I can't.	I can find a way.

- **Give yourself the opportunity (time) to succeed.** Set aside enough time for you – others in class may need more or less time than you, and depending on your preparation, you may need to devote extra time for review of the concepts or learning technology.
- **Time management.** It is important to realize and schedule time for this course. Creating an online calendar/schedule where you block out hours for studying, courses, work, etc., can help make sure you are budgeting enough time to succeed.