

Syllabus: Math 10.MP1 Elementary Statistics & Probability, Winter 2022

Math 10.MP1 Elementary Statistics & Probability

Winter 2022

Section MP1 CRN 35746 MTWThF 8:30- am – 10:20 am Online

Instructor: Greg Stachnick

Contact Information:

Email: StachnickGregory@fhda.edu

Mobile: 408-857-6421

Office Hours:

Tuesday 10:45 am – 11:45 am

Wednesday 10:45 am – 11:45 am

Or by appointment. Its easy to meet in Zoom

Location: Zoom Meeting – ID:747-709-9372

Course Counselor: Khoa Nguyen

MPS math courses have an assigned counselor. We are truly fortunate to have Khoa Nguyen as our MPS designated counselor. In addition to his outstanding counseling background, he also has a degree in math. Khoa and I have been MPS partners for several classes. We are a great team!

Counselor Contact Information:

Email: NguyenKhoa2@fhda.edu

Office: Zoom

Phone: 650-427-9217

Counselor Office Hours: Virtual Meetings in Zoom by appointment

In person meetings available

Monday 8:30 am – 9:30 am or 10:30 am – 11:30 am

Wednesday 8:30 am – 9:30 am or 10:30 am – 11:30 am

Schedule an appointment [HERE](#)

Special Note:

For a second year, the math department finds itself offering many of its classes online, including ours. With the current spread of the Delta and Omicron Variants of the COVID-19 Virus infections, this approach will be the safest for students and faculty alike. I will do my best to make this class as much like a face-to-face class as possible. To achieve this goal, I am conducting the class fully synchronously. That is a fancy word for we will meet live, daily from Monday through Friday at our scheduled time of 8:30 am to 10:20 am. **Yes, we meet five days each week and I expect all of you to be there.** Instead of MLC-

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108, my favorite classroom, we will meet in Zoom. I will continue last quarter's practice of opening the meeting about 30 minutes early for questions or just to chat if you like. Similarly, I will also keep the meeting open after class until all the remaining students get a chance to get extra help and to ask their questions. All class sessions will be recorded and posted daily in our Canvas Class as soon as I receive the link from the Zoom software.

In addition to Zoom, we will be using a combination of remote support tools including Canvas, WebAssign, a Google Drive and anything else that seems like it will help.

Quizzes, exams, and the final exam will all be conducted in WebAssign. I recognize that some of you may have unreliable internet service or older computers that might be a little slow. Some of you may even be sharing computers with other family members. To accommodate such differences in technology and access, you will be given ample time to complete these assignments. Tests will be posted in WebAssign, usually on Friday mornings and will be due on the following Monday night. Exams will be posted in WebAssign on Friday mornings and will be due Wednesday evening at midnight.

Course Description:

Introduction to data analysis making use of graphical and numerical techniques to study patterns and departures from patterns. The student studies randomness with an emphasis on understanding variation, collects information in the face of uncertainty, checks distributional assumptions, tests hypotheses, uses probability as a tool for anticipating what the distribution of data may look like under a set of assumptions, and uses appropriate statistical models to draw conclusions from data. The course introduces the student to applications in engineering, business, economics, medicine, education, social sciences, psychology, the sciences, and those pertaining to issues of contemporary interest. The use of technology (computers or graphing calculators) will be required in certain applications. Where appropriate, the contributions to the development of statistics by men and women from diverse cultures will be introduced.

The mathematics department course outline is available at [Course Outlines \(deanza.edu\)](http://deanza.edu)

Topics to Skip: include Venn Diagrams (Ch 3), Geometric, Hypergeometric, and Poisson Distributions (Ch 4), Central Limit Theorem for Sums (Ch 7) , Test of Single Variance (Ch 11)

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Prerequisite:

None, although MATH 114 or equivalent with a grade of C or better will be helpful

Advisory:

EWRT 211 and READ 211 (or LART 211), or ESL 272 and 273.

Required Materials

- **Textbook:**

Great news: your textbook for this class is available for **free** online!

[Introductory Statistics from OpenStax](#), by Illowsky & Dean, ISBN 1-947172-05-0

You have several options to obtain this book:



- [View online](#) (Links to an external site.)
- [Download a PDF](#) (Links to an external site.)
- [Download on iBooks](#) (Links to an external site.)

You can use whichever formats you want. Web view is recommended – the responsive design works seamlessly on any device. Hardcopies are available for purchase at the De Anza College Bookstore at a low cost.

- **Graphing Calculator:**

You will require a graphics calculator with statistical function for this class.

Recommended calculators are TI-83, TI-83+, TI-84 and TI-84+. If you do not already have a graphics calculator and decide to purchase one, I recommend the TI 84 Plus or higher. Other brands and models will also work just as well. You will also be provided with instructions for downloading a free software app (TI 84 Plus Emulator) on to your smartphone that will be adequate for the class. You will also be provided with instructions for downloading smartphone apps for Apple and Android. The smartphone apps have a one time fee of about \$6.00 for a perpetual license.

- **WebAssign subscription:** All homework, quizzes, tests, and exams will be done in an online system called WebAssign. The Access Code for WebAssign will be provided to you for free by the MPS Program. *Specific instructions for how to register for our class will be provided separately.*
- **Class Notes:** We will use class notes that will also be provided for free.

Grading

1. **Homework:** Homework will be done in WebAssign. It will count for 100 points or about 12% of your grade. Proficiency in mathematics comes only with frequent practice. Attending classes and completing homework assignments on time is **especially important** in accomplishing this goal.

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- 2. Friday Quizzes & Exams:** Friday is Quiz or Exam Day. There will be a short quiz posted in WebAssign each Friday Morning (see tentative course schedule below) based on the homework assignments and class discussions for the week. Weeks for which an Exam has been scheduled will not have quizzes. If you have done all of the homework, attended class and ***paid attention***, you will be very well prepared. The lowest two quiz grades will be discarded (best five out of seven). The total of five quizzes will count 100 points.
- 3. Exams:** There will be three exams and a cumulative final (see schedule below for dates). Exams will be posted in WebAssign on Friday mornings and will be due the following Wednesday. Each exam counts 100 points.
- 4. Extensions and Corrections:** After a due date for homework, a quiz, or an exam is reached, the assignment will be automatically locked. At this time, you may request an automatic 14-day extension during which you can correct mistakes and complete any unfinished problems. Correct homework solutions provided after the due date will incur a 10% late penalty. Correct quiz and exam solutions provided after the due date will incur a 25% penalty. Correct answers provided before the due date will not be effected.
- 5. Projects:** There will be two three required class homework projects/Labs. Together, projects will count 100 points.
- 6. Class Participation:** You will receive one point for each day you arrive to class on time and remain for the entire session. Participation points will be scaled to 50 points of your total grade.
- 7. Evy Monday & Lucy Tuesday:** A regularly scheduled event at the beginning of each Monday and Tuesday class.
- 8. Mindfulness Meditation:** A 20-minute activity each week. Approach this with an open mind. It will provide you with tools for stress reduction and improved focus for the rest of your life.
- 9. Extra Credit Points:** There will be in class opportunities for extra credit, stay tuned and be there.
- 10. Grade Summaries:** Your grades will be managed and maintained in WebAssign. You will be able to view your current grade any time within the online WebAssign System. Your score will be based on the completed assignments that have already passed their due dates.

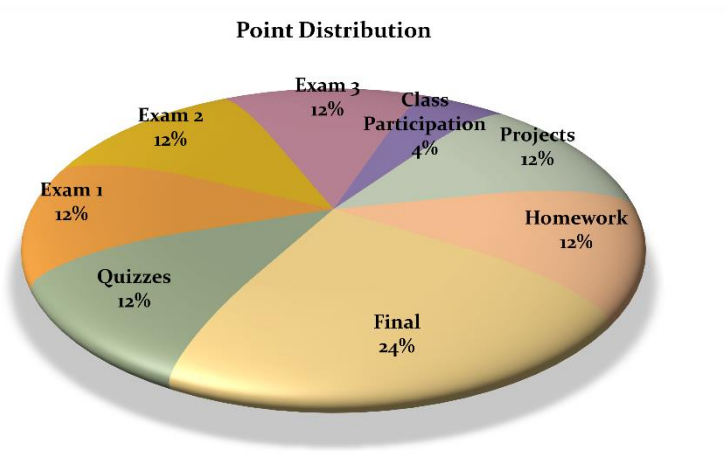
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11. Point Distribution

i. Exams:	300 Points (100 points each)
ii. Quizzes	100 Points (Best 5 out of 7, 20 points each)
iii. Homework	100 Points
iv. Lab Projects	100 Points
v. Class Participation	50 Points
vi. <u>Final</u>	<u>200 Points</u>
<u>Total</u>	<u>850 Points</u>

12. Letter Grade Breakdown

- A. 100% - 90%
- B. 89% - 80%
- C. 79% - 70%
- D. 69% - 60%
- F. 59% or below



Additional Resources

Free Tutoring: The Math Performance Success Tutor Center in Zoom Meeting Room offers free tutoring on Mondays-Thursdays from 9:00 AM-5:30 PM and Fridays 9:00 Am – 12:00 noon. Arrangements for free group tutors may be available. Make arrangements for group tutoring sessions with our counselor, Khoa. Our Canvas Class will provide the links for connecting to the MPS Tutor Center Zoom Sessions.

Supplemental Resources: Search the web for specific class topics. You will find lots of completed problems, additional written and video explanations and some very clever YouTube videos: <http://justmathtutoring.com/page17.html>.

The Kahn Academy Website <https://www.khanacademy.org/> also has some nice introductions to statistics and probability.

Academic Integrity:

Cheating will not be tolerated and will result in a grade of 0 for the assignment, quiz or exam and referral to the dean for academic discipline. Cheating includes but is not limited to: copying from other students, permitting other students to copy from you, plagiarism, submitting work that isn't your own, using notes that don't meet permitted specifications,

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continuing to write/erase on an exam/quiz after permitted time has ended, changing your exam/quiz paper after it's been graded and then requesting a grading correction. For more information about De Anza College's policy on academic integrity see: <https://www.deanza.edu/studenthandbook/academic-integrity.html>

Student Conduct:

A student who is disruptive will be asked to leave the Zoom meeting. A student who refuses to behave will be dropped from the meeting.

Attendance:

Regular class meeting attendance is expected. Zoom will be used to automatically record attendees. For this reason it is important to reset your name to be the same as the name you used when you registered for the class.

Communication:

The primary method of communication outside of class meetings will be email (stachnickgregory@fhda.edu). Any student email correspondence with the instructor should include the course number and section number or time (i.e. Math 10.MP1) in the subject line. Also include our counselor, Khoa (NguyenKhoa2@fhda.edu), on the cc line. I will respond to emails within one business day. If you really need to contact me ASAP, use my cell number (408-857-6421) to text or call me. If I do not respond right away, it isn't that I don't want to talk to you, I just may have left my phone in another room and didn't hear the call.

Zoom Etiquette:

Here are a few guidelines I would like you to follow for our Zoom meetings. If you are new to zoom, when you are asked to create a login name please use your real name as is in the class roster. If you already have a login that is not your name, after you get connected to the meeting, just change your name, by clicking on your name in the participants list and then select the "Rename" option. This will make tracking attendance much easier for me. Everyone will be muted when they join. If you have a question, unmute yourself and ask away. You can also use the Chat to ask questions and make comments. It is up to you to choose if you want your video on. There are also some non-verbal icons available for commenting. Please do not use virtual backgrounds, they consume a lot of precious network bandwidth. I did not have much success with breakout rooms last quarter because of some technical problems. I will try again. I have spent time over the summer working with Zoom tech support staff to try to iron out some of these difficulties.

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Chapter and Section Outline of our Introductory Statistics Textbook

Chapter 1: Sampling and Data

- 1.1 Definitions of Statistics, Probability, and Key Terms
- 1.2 Data, Sampling, and Variation in Data and Sampling
- 1.3 Frequency, Frequency Tables, and Levels of Measurement
- 1.4 Experimental Design and Ethics
- 1.5 Data Collection Experiment
- 1.6 Sampling Experiment

Chapter 2: Descriptive Statistics

- 2.1 Stem-and-Leaf Graphs (Stemplots), Line Graphs, and Bar Graphs
- 2.2 Histograms, Frequency Polygons, and Time Series Graphs
- 2.3 Measures of the Location of the Data
- 2.4 Box Plots
- 2.5 Measures of the Center of the Data
- 2.6 Skewness and the Mean, Median, and Mode
- 2.7 Measures of the Spread of the Data
- 2.8 Descriptive Statistics

Chapter 3: Probability Topics

- 3.1 Terminology
- 3.2 Independent and Mutually Exclusive Events
- 3.3 Two Basic Rules of Probability
- 3.4 Contingency Tables
- 3.5 Tree and Venn Diagrams
- 3.6 Probability Topics

Chapter 4: Discrete Random Variables

- 4.1 Probability Distribution Function (PDF) for a Discrete Random Variables
- 4.2 Mean or Expected Value and Standard Deviation
- 4.3 Binomial Distribution
- 4.4 Geometric Distribution
- 4.5 Hypergeometric Distribution
- 4.6 Poisson Distribution
- 4.7 Discrete Distribution (Playing Card Experiment)
- 4.8 Discrete Distribution (Lucky Dice Experiment)

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Chapter 5: Continuous Random Variables

- 5.1 Continuous Probability Functions
- 5.2 The Uniform Distribution
- 5.3 The Exponential Distribution
- 5.4 Continuous Distribution

Chapter 6: The Normal Distribution

- 6.1 The Standard Normal Distribution
- 6.2 Using the Normal Distribution
- 6.3 Normal Distribution (Lap Times)
- 6.4 Normal Distribution (Pinkie Length)

Chapter 7: The Central Limit Theorem

- 7.1 The Central Limit Theorem for Sample Means (Averages)
- 7.2 The Central Limit Theorem for Sums
- 7.3 Using the Central Limit Theorem
- 7.4 Central Limit Theorem (Pocket Change)
- 7.5 Central Limit Theorem (Cookie Recipes)

Chapter 8: Confidence Intervals

- 8.1 A Single Population Mean using the Normal Distribution
- 8.2 A Single Population Mean using the Student t Distribution
- 8.3 A Population Proportion
- 8.4 Confidence Interval (Home Costs)
- 8.5 Confidence Interval (Place of Birth)
- 8.6 Confidence Interval (Women's Heights)

Chapter 9: Hypothesis Testing with One Sample

- 9.1 Null and Alternative Hypotheses
- 9.2 Outcomes and the Type I and Type II Errors
- 9.3 Distribution Needed for Hypothesis Testing
- 9.4 Rare Events, the Sample, Decision and Conclusion
- 9.5 Additional Information and Full Hypothesis Test Examples
- 9.6 Hypothesis Testing of a Single Mean and Single Proportion

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Chapter 10: Hypothesis Testing with Two Samples

- 10.1 Two Population Means with Unknown Standard Deviations
- 10.2 Two Population Means with Known Standard Deviations
- 10.3 Comparing Two Independent Population Proportions
- 10.4 Matched or Paired Samples
- 10.5 Hypothesis Testing for Two Means and Two Proportions

Chapter 11: The Chi-Square Distribution

- 11.1 Facts About the Chi-Square Distribution
- 11.2 Goodness-of-Fit Test
- 11.3 Test of Independence
- 11.4 Test for Homogeneity
- 11.5 Comparison of the Chi-Square Tests⁵
- 11.6 Test of a Single Variance ⁶
- 11.7 Lab 1: Chi-Square Goodness-of-Fit
- 11.8 Lab 2: Chi-Square Test of Independence

Chapter 12: Linear Regression and Correlation

- 12.1 Linear Equations
- 12.2 Scatter Plots
- 12.3 The Regression Equation
- 12.4 Testing the Significance of the Correlation Coefficient
- 12.5 Prediction
- 12.6 Outliers
- 12.7 Regression (Distance from School)
- 12.8 Regression (Textbook Cost)
- 12.9 Regression (Fuel Efficiency)

Chapter 13: F Distribution and One-Way ANOVA

- 13.1 One-Way ANOVA
- 13.2 The F Distribution and the F-Ratio
- 13.3 Facts About the F Distribution
- 13.4 Test of Two Variances
- 13.5 Lab: One-Way ANOVA

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Tentative Winter 2022 Class Schedule Math 10.MP1 Elementary Statistics and Probability

	Monday	Tuesday	Wednesday	Thursday	Friday
Week 1 January	3 Intros / Ch 1	4 Ch 1	5 Ch 1	6 Ch1	7 Ch 2 Quiz 1
Week 2 January	10 Ch 2	11 Ch 2	12 Ch 2	13 Ch 2	14 Ch 2 Quiz 2
Week 3 January	17 MLK Day (1)	18 Ch 3	19 Ch 3	20 Ch 3	21 Ch 4 Exam 1
Week 4 January	24 Ch 4	25 Ch 4	26 Ch 4	27 Ch 5	28 Ch 5 Quiz 3 (2)
Week 5 Jan / Feb	31 Ch 5	Feb 1 Ch 6	2 Ch 6	3 Ch 6	4 Ch 6 Quiz 4
Week 6 February	7 Ch 6	8 Ch7	9 Ch 7	10 Ch 7	11 Ch 7 Exam 2
Week 7 February	14 Ch 8	15 Ch 8	16 Ch 8	17 Ch 8 Quiz 5	18 Presidents Day
Week 8 February	21 Presidents Day	22 Ch 9	23 Ch 9	24 Ch 9	25 Ch 9 Quiz 6 (3)
Week 9 Feb / March	28 Ch 10	March 1 Ch 10	2 Ch 10	3 Ch 10	4 Ch 11 Exam 3
Week 10 March	7 Ch 11	8 Ch 11	9 Ch 12	10 Ch 12	11 Ch 12 Quiz 7
Week 11 March	14 Ch 12	15 Ch 13	16 Ch 13	17 Ch 13	18 Review
Week 12 March	21 Final Exam Week	22	23 Final Exam Due 11:59 pm (4)	24	25

(1) Monday Jan 17: Last day to drop

(2) Friday Jan 28: Last day to request pass/no pass

(3) Fri Feb 25: Last day to drop with a W

(4) Wed Mar 23: Final Exam **Due 11:59 pm**

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IMPORTANT DATES

JANUARY 3	First day of winter quarter
JANUARY 15	Last day to add classes
JANUARY 17	Last day to drop classes without a W
JANUARY 17	Martin Luther King Jr. Holiday - no classes, offices closed
JANUARY 28	Last day to request " Pass/No Pass "
FEBRUARY 18-21	Presidents' Holiday - no classes, offices closed
FEBRUARY 25	Last day to drop classes with a W
MARCH 1	Last day to file for fall degree or certificate
MARCH 21-25	Final exams

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Student Learning Outcome(s):

*Organize, analyze, and utilize appropriate methods to draw conclusions based on sample data by constructing and/or evaluating tables, graphs, and numerical measures of characteristics of data.

*Identify, evaluate, interpret and describe data distributions through the study of sampling distributions and probability theory.

*Collect data, interpret, compose and defend conjectures, and communicate the results of random data using statistical analyses such as interval and point estimates, hypothesis tests, and regression analysis.