

# Syllabus: Math 10.MP1 Elementary Statistics & Probability, Winter 2024

Math 10.MP1 Elementary Statistics & Probability

Winter 2024

Section MP1 CRN 38545 MTWTh 8:30- am – 10:45 am Online Synchron

Instructor: Greg Stachnick

## Contact Information:

Email: [StachnickGregory@fhda.edu](mailto:StachnickGregory@fhda.edu)

Mobile: 408-857-6421

## Office Hours:

Monday through Thursday 08:00 am – 08:30 am

And 10:45 am – Until no more questions

Or by appointment

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

## Course Counselor: Yolanda Johnson

Email: [johnsonyolanda@fhda.edu](mailto:johnsonyolanda@fhda.edu)

MPS math courses have an assigned counselor. We are very fortunate to have Yolanda Johnson returning to MPS as our designated class counselor. Yolanda and I have already worked together as MPS partners. We are a great team. Yolanda has been a De Anza College Counselor for a number of years.

## Special Note:

For a third year, the math department finds itself offering many of its classes online, including ours. With the current spread of the virus triple threat 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 Thursday at our scheduled time of 8:30 am to 10:45 am. **Yes, we meet four days each week and I expect all of you to be present.** Instead of MLC-108, my favorite campus classroom, we will meet in Zoom. I will continue my practice of opening the meeting about 30 minutes early for questions or just to chat if you like. A former student named this part of our Zoom class the Breakfast Club. 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.

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We have a new opportunity for additional support this quarter. It is likely that you have heard about some of the recent Artificial Intelligence developments in the area of Generative AI that is manifested in an application called ChatGPT. ChatGPT stands for Chat Generative Pre-Trained Transformer. ChatGPT is a large language model developed by OpenAI and uses a technology called Neural Networks. ChatGPT has caused a lot of problems for educational institutions regarding cheating. We have an opportunity to participate in a pilot program using an application called **MathGPT**. MathGPT is being trained on our class textbook, unlike ChatGPT which is trained on a wide variety of information sources across the internet. My specific intent for usage of this software for our class is for assistance with homework, additional explanations and clarifications of concepts in our textbook or the class notes. It is not to be used for quizzes, midterms or exams or the final exam. I will explain more about Chat bots on our first day of class.

Homework, 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. Quizzes will be posted in WebAssign, usually on Thursday mornings and will be due on the following Monday night. Exams will be posted in WebAssign on Thursday mornings and will be due the following 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)

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## Prerequisite:

There are no prerequisites, although some basic algebra skills like solving linear equations 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** and available 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 functions 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) onto your computer 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. *Specific instructions for how to register for our class will be provided separately.*
- **Class Notes:** We will use a binder of guided class notes that will also be provided for free.

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## 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.
- 2. Thursday Quizzes & Exams:** Thursday is Quiz or Exam Day. There will be a short quiz posted in WebAssign each Thursday 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 Thursday mornings and will be due the following Wednesday. Each exam counts 100 points.
- 4. Extensions and Corrections:** Except for the Final Exam, corrections are permitted and encouraged for Homework, Quizzes, Midterms, and Labs. It is a good idea to accumulate as many points as possible before the Final.

For assignments completed in WebAssign, corrections are requested by selecting the assignment and then choosing the option for an **Automatic Extension**. If the assignment does not appear in your list, select past assignments first. The request must be made within 14 days of the original due date. Once the extension is granted, you will have 14 days to complete your corrections. The same rules apply for the number of tries as with the original assignment. Please note that extensions can only be requested after the due date has passed.

For Homework, you can make the extension request as soon as the due date passes. For Quizzes and Exams, you should wait for an email from me that indicates the number of tries has been reset and then proceed as above.

Corrections for Labs should be done in the same Google Doc as the original write-up. Identify the corrections with a change in font color or use highlighting. Leave the original answers as they were so I can compare. When your corrections are completed, send a message to my faculty email ([StachnickGregory@fhda.edu](mailto:StachnickGregory@fhda.edu)) indicating you are finished and include the name of your Google Doc file, so I will know which file you want me to re-grade.

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 are not affected.

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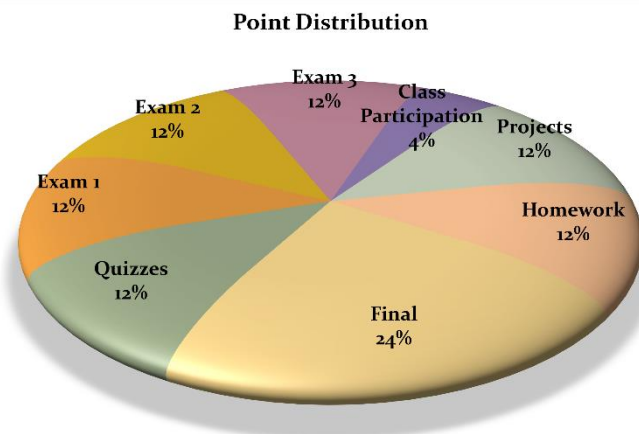
5. **Projects/Labs:** There will be four required class homework projects/Labs. Together, they will count 100 points.
6. **Class Participation:** You will receive one point for each day you arrive to class on time and remain for the entire session. Participation points will be scaled to 50 points of your total grade.
7. **Lucy & Evy Tuesday:** A regularly scheduled event at the beginning of each Tuesday class.
8. **Mindfulness Meditation (tentative):** A 20-minute activity each Tuesday. Approach this with an open mind. It will provide you with tools for stress management 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 to get them.
10. **Grade Summaries:** Your grades will be managed and maintained in WebAssign (not Canvas). 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. Assignments that have not yet reached their due dates are not included in this grade calculation.

### 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>
Total	850 Points

### 12. Letter Grade Breakdown

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



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## Additional Resources

**Free Tutoring:** The Math Performance Success Tutor Center offers free tutoring online and in-person. A link to the MPS Tutor Center schedule can be found at [MPS Tutoring \(deanza.edu\)](https://deanza.edu/mptutoring). Arrangements for free group tutors may be available. Make arrangements for group tutoring sessions with our counselor, Yolanda. Our Canvas Class will also 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.

**MathGPT** is our special assistant to help with explanations of the textbook material and provide assistance with solutions to homework problems. Unlike ChatGPT, MathGPT will not provide a completely worked out solution with answers, but helpful hints and explanations to guide you to a correct answer.

## 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, 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. Just logging in to the meeting and then ditching may work on some days. However, we will be using Zoom Polls to answer questions from time to time and if you do not respond to the poll, I will assume you left early and you will be counted as absent.

# **Syllabus: Math 10.MP1 Elementary Statistics & Probability, Winter 2024**

## **Communication:**

The primary method of communication outside of class meetings will be through my faculty email ([stachnickgregory@fhda.edu](mailto: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, (TBD), 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. If our counselor or I send you an email, please respond. We are not trying to get into your personal business, we just want to know if you are ok or if we can help you in some way. Even if you don't want to talk, just say can't talk now.

## **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 it appears 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. You are welcome to share your video. There are also some non-verbal icons available for commenting. Please do not use virtual backgrounds, they consume a lot of precious network bandwidth. We will be using Breakout Rooms to work with teammates on labs. Lab Teammates will share a common grade.

# **Syllabus: Math 10.MP1 Elementary Statistics & Probability, Winter 2024**

## **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

### **Chapter 5: Continuous Random Variables**

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

### **Chapter 6: The Normal Distribution**

- 6.1 The Standard Normal Distribution
- 6.2 Using the Normal Distribution



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## **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
- 7.5 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

## **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 Tests
- 11.6 Test of a Single Variance
- 11.7 Lab 1: Chi-Square Goodness-of-Fit
- 11.8 Lab 2: Chi-Square Test of Independence

# **Syllabus: Math 10.MP1 Elementary Statistics & Probability, Winter 2024**

## **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

# Syllabus: Math 10.MP1 Elementary Statistics & Probability, Winter 2024

## Tentative Winter 2024 Class Schedule Math 10.MP1 Elementary Statistics and Probability

	Monday	Tuesday	Wednesday	Thursday	Friday
<b>Week 1 January</b>	8 Intros / Ch 1	9 Ch 1	10 Ch 1	11 Ch 1 <b>Quiz 1</b>	12 No Class
<b>Week 2 January</b>	15 <b>MLK Day Holiday</b>	16 Ch 2	17 Ch 2	18 Ch 2 <b>Quiz 2</b>	19 No Class <b>(1,2)</b>
<b>Week 3 January</b>	22 Ch 3	23 Ch 3	24 Ch 3	25 Ch 3 <b>Exam 1</b>	26 No Class
<b>Week 4 January</b>	29 Ch 4	30 Ch 4	31 Ch 5	1 Ch 5 <b>Quiz 3</b>	2 No Class
<b>Week 5 Jan/Feb</b>	5 Ch 6	6 Ch 6	7 Ch 6	8 Ch 7 <b>Quiz 4</b>	9 No Class
<b>Week 6 February</b>	12 Ch 7	13 Ch7	14 Ch 7	15 Ch 8 <b>Exam 2</b>	16 <b>Presidents' Holiday</b>
<b>Week 7 February</b>	19 <b>Presidents' Holiday</b>	20 Ch 8	21 Ch 8	22 Ch 9 <b>Quiz 5</b>	23 No Class
<b>Week 8 Feb/Mar</b>	26 Ch 9	27 Ch 9	28 Ch 9	29 Ch 10 <b>Quiz 6 (3)</b>	1 No Class <b>(3)</b>
<b>Week 9 March</b>	4 Ch 10	5 Ch 10	6 Ch 10 <b>Exam 3</b>	7 Ch 11 <b>Exam 3</b>	8 No Class
<b>Week 10 March</b>	11 Ch 11	12 Ch 11	13 Ch 12	14 Ch 12 <b>Quiz 7</b>	15 No Class
<b>Week 11 March</b>	18 Ch 12	19 Ch 13	20 Ch 13	21 Review	22 No Class
<b>Week 12 March</b>	25 <b>Final Exam Week</b>	26	27 <b>Final Exam Due 11:59 pm (4)</b>	28	29

(1) Saturday Jan 20: Last day to Add a class

(2) Sunday Jan 21: Last day to drop w/o W

(3) Fri Mar 1: Last day to drop with a W(withdraw)

(4) Wed Mar 27 Final Exam

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## IMPORTANT DATES

JANUARY 8	FIRST DAY OF WINTER QUARTER
JANUARY 15	MARTIN LUTHER KING DAY NO CLASSES, OFFICES CLOSED
JANUARY 20	LAST DAY TO <a href="#">ADD CLASSES</a>
JANUARY 21	LAST DAY TO <a href="#">DROP CLASSES</a> WITHOUT A W
FEBRUARY 16-19	PRESIDENT'S HOLIDAY NO CLASSES, OFFICES CLOSED
MARCH 1	LAST DAY TO <a href="#">DROP CLASSES</a> WITH A W
MARCH 25-29	<a href="#">FINAL EXAMS</a>
NOVEMBER 18	

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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 evaluate conjectures, and communicate the results of random data using statistical analyses such as interval and point estimates, hypothesis tests, and regression analysis.

## **Office Hours:**

T,TH 10:45 AM 11:45 AM Zoom