

Syllabus: Math 10.MP1 Elementary Statistics & Probability, Spring 2020

Math 10.MP7 Elementary Statistics & Probability

Spring 2020

Section MP1 CRN 01214 MTWThF 8:30- am – 10:20 am Online

Instructor: Greg Stachnick

Contact Information:

Email: StachnickGregory@fhda.edu

Mobile: 408-857-6421

Office Hours:

Tuesday 9:45 am – 10:45 am

Wednesday 9:45 am – 10:45 am

Or by appointment

Location: Zoom Meeting – ID:747-707-9372

Course Counselor: Melissa Maturino

MPS math courses have an assigned counselor. We are very fortunate to have Melissa Maturino as our designated counselor. In addition to her counseling background, she is also a former MPS student.

Counselor Contact Information:

Email: MaturinoMelissa@deanza.edu

Office: S5-6A

Phone: 408.864.8249

Counselor Office Hours: Zoom Meeting TBD
Or by appointment

Special Note:

We are all surprised that this course became a fully online course rather suddenly with the spread of the NOVID-19 virus. So, we will be using a combination of remote support tools including Canvas, Zoom, WebAssign, a Google Drive and anything else that seems like it will help. The course will be taught synchronously, fancy word for live, during the regularly scheduled time 8:30 am – 10:20 am, daily. These sessions will be done as Zoom meetings. It has been my practice to open the classroom early for students to come and ask questions or just to chat. I will continue this practice by starting the class meetings early. After class I typically went over to the MPS Tutor Center to hang out for a few hours in case students want extra help. I will continue this practice by keeping the class meeting open after we hit the scheduled end time. It worked well during the last week of the Winter Quarter. I had students join

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early and stay late for extra help. This quarter will be a learning experience for all of us as we venture into the arena of totally online course work. We will need to be patient with and respectful toward each other and be sure to offer constructive suggestions as we think of them.

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.

A course outline is available at

<http://ecms.deanza.edu/outlineprogresspublic.html?catalogID=2175>

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)

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

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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:**
Recommended calculators are TI-83, TI-83+, TI-84 and TI-84+. For the Face-to-Face classes the MPS Program calculators could be **borrowed** from the Math Department. This quarter we will use a free online version of a graphics calculator, which at this time is still TBD.
- **WebAssign subscription:** All homework will be done in an online homework system called WebAssign. The access code for WebAssign will be provided to you for **free** when classes start. *The publisher, Cengage, is providing students free access to the WebAssign software for the Spring Quarter. Instruction to follow.*
- **Class Notes:** We will use class notes that will be provided for free on a Google Drive

Grading

1. **Homework:** Homework will be done in WebAssign. The WebAssign Course ID and specific registration instructions will be provided separately. Proficiency in mathematics comes only with frequent practice. Attending classes and completing homework assignments on time is very important in accomplishing this goal.
2. **Gone in 60 Seconds Daily Quiz:** Starting Wednesday April 15, during the first minute of class students will answer a single question based on previous day's class discussion or homework assignment. Each question counts as one point. No exceptions for late arrivals. The only exceptions are days for which an Exam or Friday quiz is already scheduled. Gone in 60 Seconds quizzes will account for 50 points in total.
3. **Friday Quizzes:** Friday is Quiz Day. There will be a short quiz at the end of class each Friday (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). No make-ups for quizzes.
4. **Exams:** There will be three exams and a cumulative final (see schedule below for dates). If you miss a midterm, you must schedule a make-up within one week.

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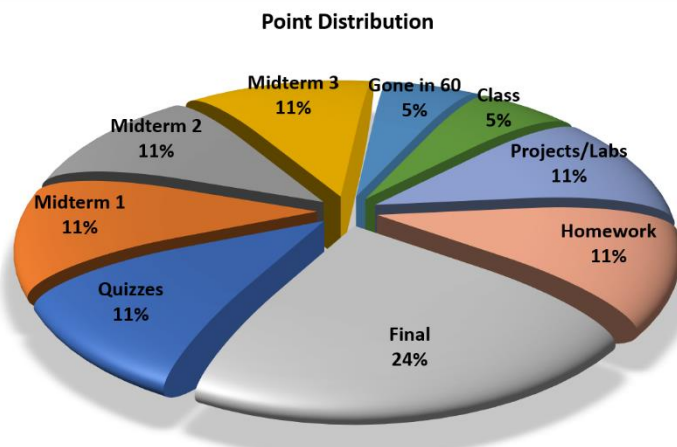
5. **Projects:** There will be three required class homework projects/Labs.
6. **Lucy Tuesday:** A regularly scheduled event for the beginning of each Tuesday class
7. **Mindful Meditation:** An ungraded 20-minute activity each week
8. **Extra Credit Points:** There will be in class opportunities for extra credit, stay tuned and be there.

9. Point Distribution

i. Exams:	300 Points (100 points each)
ii. Quizzes	100 Points (Best 5 out of 7, 20 points each)
iii. Gone in 60 Seconds	50 Points
iv. Class Work	50 Points
v. Homework	100 Points
vi. Lab Projects	100 Points (Two projects, 50 points each)
vii. <u>Final</u>	<u>200 Points</u>
Total	900 Points

10. 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, Melissa.

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.

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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. Registered students missing any day the first week, without first notifying the instructor will be dropped from the course. After the first week, a student may be dropped from the class if she/he is absent three times, without first notifying the instructor. If you miss a quiz because you skipped class you will receive a zero for that assignment. Dropping or withdrawal from the class due to hardship is the students' responsibility. A student who stops coming to class and does not drop will receive an "F" grade. It is the students' responsibility to inform the instructor if she/he is going to be absent and is responsible for any material covered/announcements made on the day of the absence. MPS students are required to sign a contract during the first class meeting. This contract will explain your commitments for class attendance, completing assignments and maintaining passing grades.

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.MP7) in the subject line. Also include our counselor, Melissa (MaturinoMelissa@fhda.edu), on the cc line. I will respond to emails within one business day.

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Chapters and Section of Introductory Statistics

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)

Chapter 5: Continuous Random Variables

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

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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

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

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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 2019 Class Schedule Math 10.MP1 Elementary Statistics and Probability

	Monday	Tuesday	Wednesday	Thursday	Friday
Week 1 April	13 Intros / Ch 1	14 Ch 1	15 Ch 1	16 Ch1/Ch2	17 Ch 2 Quiz 1
Week 2 April	20 Ch 2	21 Ch 2	22 Ch 2	23 Ch 3	24 Ch 3 Quiz 2 (1)
Week 3 April/May	27 Ch 3	28 Ch 3	29 Ch 3	30 Ch 4	May 1 Exam 1
Week 4 April/May	4 Ch 4	5 Ch 4	6 Ch 4	7 Ch 5	8 Ch 5 Quiz 3 (2)
Week 5 May	11 Ch 5	12 Ch 6	13 Ch 6	14 Ch 6	15 Ch 6 Quiz 4
Week 6 May	18 Ch 6	19 Ch7	20 Ch 7	21 Ch 7	22 Exam 2
Week 7 May	25 Memorial Day	26 Ch 7	27 Ch 8	28 Ch 8	29 Ch 8 Quiz 5
Week 8 June	June 1 CH 9	2 Ch 9	3 Ch 9	4 Ch 9	5 Ch 10 Quiz 6 (3)
Week 9 June	8 Ch 10	9 Ch 10	10 Ch 11	11 Ch 11	12 Exam 3
Week 10 June	15 Ch 12	16 Ch 12	17 Ch 13	18 Ch 13	19 Review
Week 11 June	22 Final Exam 7:00-9:00 am (4)	23	24 Final Exam Week	25	26
Week 12 June	29	30			

- (1) Sunday Apr 26: Last day to drop (2) Friday May 8: Last day to request pass/no pass
 (3) Fri June 5: Last day to drop with a W(withdraw) (4) Wed Jun 24, Final Exam **7:00**-9:00 am

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Important Dates

APRIL 13

First day of spring quarter classes (one week later than originally scheduled)

APRIL 25

Last day to [add classes](#)

APRIL 26

Last day to [drop classes](#) for full refund or credit

APRIL 26

Last day to [drop classes](#) without a W

MAY 8

Last day to request "[Pass/No Pass](#)" for full-length classes

MAY 23-25

Memorial Day Weekend - Campus Closed

JUNE 5

Last day to [drop classes](#) with a "W"

JUNE 22-26

[Final exams](#)

JUNE 26

[Graduation](#)

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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.