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

Math 10.MP1 Elementary Statistics & Probability   **Fall 2020**

      Section MP1   CRN 20970   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
      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: 909-272-0865

Counselor Office Hours: Zoom Meetings TBD
                             Or by appointment

Special Note:

      For the second quarter in a row, the math department finds itself offering only online classes. With the current spread of 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.*** Instead of MLC-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.

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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.

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
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

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- **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:**
  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. Current plan for this quarter is that Class Notes, a calculator to borrow, and a free Access Code for WebAssign will be mailed to you.

- **WebAssign subscription**: All homework, quizzes, tests, and exams will be done in an online system called WebAssign.   *Instructions for how to register for our class will be provided separately.*

- **Class Notes:** We will use class notes that will be provided for free.

Grading

1. **Homework:** Homework will be done in WebAssign. It will count for 100 points or about 12% of you 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. **Friday Quizzes:** Friday is Quiz Day. There will be a short quiz posted in WebAssign 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. 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). If you miss an exam, you must schedule a make-up within one week. Each exam counts 100 points.

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4. **Projects:** There will be two required class homework projects/Labs. Together, projects will count 100 points.

5. **Lucy Tuesday**: A regularly scheduled event at the beginning of each Tuesday class

6. **Mindful 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.

7. **Extra Credit Points:** There will be in class opportunities for extra credit, stay tuned and be there.

8. **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 (Two projects, 50 points each)
v.	Final	200 Points
	Total	800 Points

9. **Letter Grade Breakdown**
   - A. 100% - 90%
   - B. 89% - 80%
   - C. 79% - 70%
   - D. 69% - 60%
   - F. 59% or below

Point Distribution
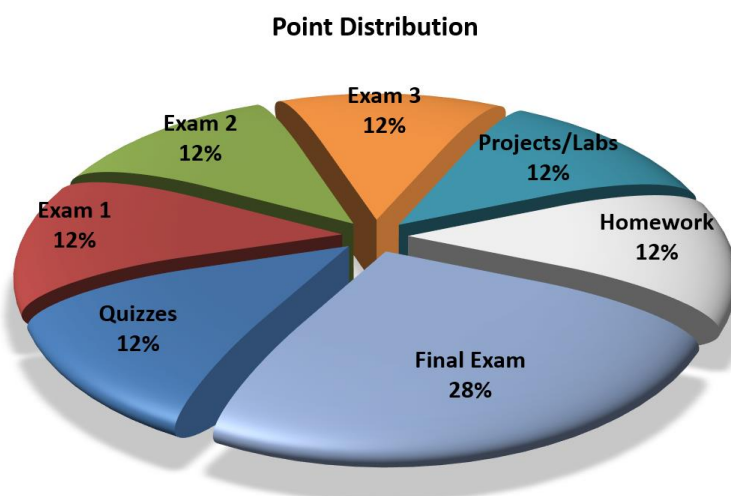
Additional Resources

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.

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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, 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 dropped from the meeting.

Attendance:

Regular class meeting attendance is expected. Zoom will be used to record attendees.

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 you 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.

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

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

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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 Fall 2020 Class Schedule
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	Monday	Tuesday	Wednesday	Thursday	Friday
Week 1 September	**21** Intros / Ch 1	**22** Ch 1	**23** Ch 1	**24** Ch1	**25** Ch 2 Quiz 1
Week 2 Sep/Oct	**28** Ch 2	**29** Ch 2	**30** Ch 2	**Oct 1** Ch 2	**2** Ch 3 Quiz 2 **(1)**
Week 3 October	**5** Ch 3	**6** Ch 3	**7** Ch 3	**8** Ch 4	**9** Ch 4 Exam 1
Week 4 October	**12** Ch 4	**13** Ch 4	**14** Ch 4	**15** Ch 5	**16** Ch 5 Quiz 3 **(2)**
Week 5 October	**19** Ch 5	**20** Ch 6	**21** Ch 6	**22** Ch 6	**23** Ch 6 Quiz 4
Week 6 October	**26** Ch 6	**27** Ch7	**28** Ch 7	**29** Ch 7	**30** Ch 7 Exam 2
Week 7 November	**2** Ch 7	**3** Ch 8	**4** Ch 8	**5** Ch 8	**6** Ch 9 Quiz 5
Week 8 November	**9** CH 9	**10** Ch 9	**11** Veterans Day Holiday	**12** Ch 9	**13** Ch 10 Quiz 6 **(3)**
Week 9 November	**16** Ch 10	**17** Ch 10	**18** Ch 10	**19** Ch 11	**20** Ch 11 Exam 3
Week 10 November	**23** Ch 11	**24** Ch 12	**25** Ch 12 Quiz 7	**26** Thanksgiving Break	**27**
Week 11 Nov/Dec	**30** Ch 12	**Dec 1** Ch 13	**2** Ch 13	**3** Ch 13	**4** Review
Week 12 December	**7** Final Exam Week	**8**	**9** Final Exam 7:00–9:00 am **(4)**	**10**	**11**

(1) Sunday Oct 4: Last day to drop   (2) Friday Oct 16: Last day to request pass/no pass
(3) Fri Nov 13: Last day to drop with a W(withdraw) (4) Wed Dec 9 Final Exam **7:00**-9:00 am

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Important Dates

SEPTEMBER 21	First day of fall quarter
OCTOBER 3	Last day to add classes
OCTOBER 4	Last day to drop classes without a W
OCTOBER 16	Last day to request "Pass/No Pass" for 12-week classes
NOVEMBER 11	Veterans Day holiday: Campus closed (corrected date)
NOVEMBER 13	Last day to drop classes with "W"
NOVEMBER 26-29	Thanksgiving holiday: Campus closed
DECEMBER 1	Last day to file for fall degree or certificate
DECEMBER 7-11	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.