

MATH 140 *INTRODUCTORY STATISTICS* COURSE SYLLABUS

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Office Hours: M 1:15-2:15, W F 9:30-10:30 or by appointment in Santa Susanna Hall 415.

Required Text: *Workshop Statistics, Discovery with Data* (second edition), by Rossman and Chance.

Supplemental Recommended Manual: *We All Make Mistakes: Common Errors in Introductory Statistics (and How to Avoid Making Them)*, by Mark Schilling.

On-Line Component: The Carnegie Mellon Open Learning Initiative Statistics course will provide a detailed treatment of the course material. You are expected to read this on-line material and do many of the associated activities, including quizzes. The pacing will be keyed to that of the lectures and text. You will need to log in at <https://oli.web.cmu.edu>. The Course Admit Code is: Math140Hf08, and there is a \$25 registration fee.

What to Expect in Class: This is an *active learning* course. I will generally not lecture for more than a few minutes at a time. You will spend a large portion of class time participating in the textbook's In-Class Activities. Some of these activities will be done best working cooperatively with a partner. We will also spend time discussing questions and issues arising in the homework, exams or the readings.

Homework: Homework problems will be assigned from each Topic (Chapter) covered. Questions on the HW will be taken at the beginning of the very next class period after it is assigned, and it will normally be due, **stapled**, two class periods after it is assigned.

Project: You will be required to complete a small ongoing team project involving data collection, display of results, and analysis.

Cell phones: Cell phones, pagers, etc. must be turned to silent during every class period. *An electronic device that goes off audibly during class time may result in a pop quiz.*

Grade Components:	In-Class Activities (5%)	Three tests (30% total)
	Textbook Homework (20%)	Comprehensive final exam (20%)
	On-line work (15%)	CAOS Exam (Pre and Post) (5%)
	Project (5%)	

Other factors are participation and a good attitude towards learning.

Attendance Policy: Due to the interactive nature of the classroom learning environment, it is essential to attend every class meeting. Two absences are allowed without penalty. Each additional absence results in a deduction of 1% from the total number of points achievable for the course, up to a maximum penalty of 10%. The maximum penalty is normally sufficient to drop your grade by one full letter, e.g. from B⁻ to C⁻ or from C to D. You will receive a bonus of 2% for perfect attendance, or 1% if you have just one absence. Tardiness is not acceptable and may result in a loss of attendance credit. Moreover, you must be on time for class in order to keep up with the In-Class Activities.

Examinations: Examinations will include problem solving, short answer questions on concepts, construction and interpretation of graphical displays, definitions, true/false and multiple choice. The Final Exam is on Monday, December 15th, 10:15 a.m.-12:15 p.m. and will be comprehensive.

**** NO MAKE UP EXAMS WILL BE GIVEN ****

Additional Information and Notes

Communication: From time to time I will send announcements by email to the class. Make sure to set up your own computer to forward your CSUN email to the email account you use most regularly.

Calculators: A calculator that can perform basic statistical functions for both one and two variable analyses could be helpful for some of the homework. Suitable models are available for under \$20, or you can rent a more powerful TI-83 or TI-84 (if you don't want to buy one) from www.myti83.com or www.ti83calculator.com. Exams will not require a calculator for anything beyond basic arithmetic.

Minitab statistical software: If you wish you can purchase and download a copy of Minitab for personal use for \$29.99 for the semester from www.minitab.com/education/semesterrental. You can also use the computers in our classroom during the hours that the lab is open.

More on homework: Where applicable, you will be graded on your explanations and justification, not solely on having the correct numerical work. You may brainstorm the homework with one or more other students, but all work you turn in should be your own. Copying others' solutions is not acceptable and will result in a substantial loss of credit. Late homework turned in at the next class meeting after the due date will be worth only 50% of the original points; after that it will not be accepted. If for some reason you cannot make it to class when an assignment is due, give it to a friend or fax it to the Math Department at 818-677-3634. Please do not send it as an attachment to an email.

CAOS test: You will take the CAOS test (Comprehensive Assessment of Outcomes in a first Statistics Course) both at the beginning and the end of the semester. The test consists of 40 multiple choice questions, is taken on line, and takes 30 to 45 minutes to complete. Together the two tests will count for 5% (2½ % each test) of your grade. The pretest will be scored only for completeness (i.e., you just need to answer every question—but please do your best, without using outside sources), while the posttest will be scored for correctness as well.

Grading scheme: I do not use a 90-80-70 scale for exam or course grades. Score ranges are set separately for each exam or other grade component.

Lab etiquette: During class you are not permitted to use the lab computers for anything that is not directly related to the class itself. You should keep your keyboard and mouse on the side of your monitor except when we are using the computers for classwork. Printing is not allowed without my permission. Food and drink, including water, are **prohibited** in the lab. There is a drinking fountain right outside the room.

Measurable Course Objectives

Statistics can be defined as the science of reasoning from data. Data and statistical thinking abound in everyday life and in almost all academic disciplines, so the ability to reason with data is essential to educated citizenship. This course will focus on understanding statistical concepts and reasoning; organizing, interpreting and producing data; analyzing statistical arguments and communicating findings clearly; and appreciating the relevance of statistics to contemporary society. Specific course learning outcomes are listed below:

- Learn how to construct and interpret graphical and numerical summaries of data
- Understand many of the fundamental ideas of statistics, such as variability, distribution, association, sampling
- Understand how the nature of data collection methods affects the scope of the conclusions that can be drawn from statistical studies (especially cause and effect); the role of probability in sampling and experiments
- Learn the normal distribution and the Central Limit Theorem
- Learn the basics of statistical inference: estimation, assessing statistical significance, statistical reasoning; apply and interpret the results of a variety of statistical techniques
- Analyze and assess statistical arguments, such as those found in the popular press and scholarly publications;
- Learn about correlation and regression
- Communicate knowledge of statistical ideas effectively

G.E. Student Learning Outcomes

As a course that fulfills the above mentioned General Education requirement, this class will address the following Student Learning Outcomes (SLO's) that have been established by the Mathematics Department:

SLO 1 Represent, understand and explain mathematical information symbolically, graphically, numerically and verbally.

SLO 2 Develop mathematical models of real-world situations and explain the assumptions and limitations of those models.

SLO 3 Use models to make predictions, draw conclusions, check whether the results are reasonable, and find optimal results using technology where necessary and appropriate.

SLO 4 Demonstrate an understanding of the nature of mathematical reasoning including the ability to prove simple results and/or make statistical inferences.

Examples of activities that will involve the SLO's are given below:

SLO 1: Summarizing distributions with numerical measures such as mean, median, standard deviation, interquartile range; making and interpreting dotplots, histograms, stem plots, bar charts, scatterplots; describing relationships with least squares regression equations; standard scores (Z-scores). A majority of homework and examination questions will involve verbal statements that involve statistical interpretations.

SLO2: The normal and other distributions; random number tables to represent populations; simulation; least squares regression equations; tests of significance.

SLO3: Probability models; confidence intervals and tests of significance; statistical pitfalls; choosing the sample size; using experimental design to reduce variability. The Minitab statistical software will be used frequently in class and for homework to generate statistical graphs, perform simulations, and make statistical computations.

SLO4: Understanding the logic and structure of methods of statistical inference is a critical aspect of the course. This includes making correct interpretations and conclusions for confidence intervals and tests of significance.