



Syllabus

Course: Elementary Statistics
Semester: 2020-21 Fall
Lecture: 48
Lab: 0
Instructor: Prof. Dariusz Wanatowski
Contact: dwanat@gmail.com
Credits: 3
Course code: STAT2013

Course Description: An introductory course in the theory and methods of statistics including descriptive measures, elementary probability, samplings, estimation, hypothesis testing, correlation and regression.

Prerequisites: None

Course Objectives: The objective of this course is to provide students with basic understanding of statistical concepts including descriptive measures, elementary probability, probability distributions, sampling, estimation, hypothesis testing, regression, and correlation analysis.

Learning Objectives:

- Summarize data graphically by displaying data using methods from descriptive statistics, interpreting data in tables graphically by using histograms, frequency distributions, box plots (five-number summary); find measures of central tendency for data sets: mean, median, and mode; find measures of variation for data sets: standard deviation, variance, and range; relative positions of data; distinguish between populations and samples; and identify the standard method of obtaining data and the advantages and disadvantages of each.
- Find simple probabilities and probabilities of compound events and



compute probabilities using the complement, discrete probability distributions, apply concepts of sample space, the binomial probability distribution.

- Standardize a normally distributed random variable, use normal distribution tables to find probabilities for normally distributed random variables and the t-distribution, and use the Central Limit Theorem to find probabilities for sampling distributions.
- Construct and interpret confidence intervals for proportions and means.
- Identify the basics of hypothesis testing and perform hypothesis testing for means, proportions and standard deviations from one population, and difference of means and proportions from two populations, including finding and interpreting P-value and examining Type I and Type II error.
- Find linear least-squares regression equations for appropriate data sets, graph least-square regression equations on the scatter plot for the data sets, and find and apply the coefficient of correlation.

Course Learning Outcomes:

Upon completion of the course, students should be able to:

- Demonstrate knowledge of statistical terms.
- Organize and represent data in frequency distributions graphically, using histograms, frequency polygons, ogives, stem and leaf plots.
- Summarize data, using measures of central tendency, such as the mean, median, mode, and midrange.
- Describe data, using measures of variation, such as the range, variance, and standard deviation.
- Determine sample spaces and find the probability of an event, using classical probability or empirical probability.
- Construct a probability distribution for a random variable and find probability of a binomial experiment.
- Identify the properties of a normal distribution and find probabilities



for a normally distributed variable.

- Find the confidence interval for the mean and determine the minimum sample size for finding a confidence interval for the mean and a proportion.
- State the null and alternative hypotheses and test means and proportions using the z-test and t-test.
- Test the difference between sample means using the z-test and the t-test.
- Draw a scatter plot, compute the correlation coefficient and compute the equation of the regression line.
- Test the significance of the linear correlation coefficient.

Office Hours: Tuesdays 13:00-14:00

Required Texts: Elementary Statistics: A Step-by-Step Approach, 10th edition, by Allan G. Bluman

Recommended Texts: N/A

Reading Assignments: N/A

Assignment Submission and Classroom Conduct Policy:

HOMEWORK

- There are 5 equally weighted homework assignments.
- Homework must be completed and handed in before the next lecture.

FINAL EXAM

- The final exam will be cumulative, covering syllabus from Chapters 1 through 10.

Dress Code Requirements: None

PPE (Personal Protective Equipment for Lab Only): N/A

Attendance and late arrival policy: Attendance is compulsory. Students should be in the classroom on time.



Classroom Behavior: Active participation is highly encouraged. Extra credit for active class participation will be awarded. It is students' responsibility to come to class prepared. Students will be responsible for bringing their textbook every week and making their own notes in the lectures. Students must make sure they have all necessary materials to participate in each lectures.

Grading Policy:

The final grade is returned as a numeric score out of 100 and consists of the scores from all the homework assignments, quizzes and the final exam. The homework assignments are worth 25%, the quizzes 25% and the final exam is worth 50%.

Academic Misconduct:

In this course, all the assignments including homework and quizzes should represent your individual effort, unless explicitly stated in the assignment. You may talk with other students and tutors about your assignments, but you should work through the computations individually and submit your own answers.

Laptop Computers: Not required in the classroom.

Permissible Calculators:

- Students will need a calculator for assignments and exams.
- The course textbook provides detailed instructions for TI-84 Plus calculator.
- However, any calculator capable of computing two-variable stats, combinations (nCr), and factorials ($n!$) will be acceptable.

Syllabus Fee/Course Receipt: N/A

Course Outline: An introductory course in the theory and methods of statistics including descriptive measures, elementary probability, samplings, estimation, hypothesis testing, correlation and regression.

Other things I would like to specify: Extra credit of max. 5% of the total grade can be obtained through active participation in the classroom.