STA 2215 – Introduction to Statistics for Social Sciences

Instructor: Padmini Mukkamala
Email: padmini.mvs@gmail.com

Office hours: shortly before and after class.

Course description: The purpose of this course is to give a conceptual introduction to the field of statistics and its many applications. This course is application oriented and designed with the needs of the non-mathematician in mind. Applications of data analysis and statistical methodology are an integral part of the organization and presentation of the material. Students will find that this course provides good preparation for the study of more advanced statistical material. Prerequisite: Passing both parts (Arithmetic and Algebra) of the Mathematics Proficiency Test

Textbook
Anderson, Sweeney, Williams, Freeman, and Shoesmith. 2009. *Statistics for Business and Economics*. South-Western CENGAGE Learning. ISBN: 978-1-84480-313-2

Grading

Homework	– 25%
Quizes	– 20%
Midterm	– 25%
Final exam	– 30%

Final letter grades will be based on the McDaniel College scale in the Guidance Bulletin.

Honor code
You are expected to adhere to the McDaniel College academic honor code. Any violation will result in a zero on the related assignment or exam or other appropriate measures.

Class attendance
Class attendance is mandatory. After a student's third unexcused absence, all additional unexcused absences result in an automatic drop in the student's final grade, one letter grade per absence.

Homework policies
Weekly homework will be assigned and is due at the beginning of the first class the following week. Homework must be sent via email, probability problems typed in the student's preferred document editor and statistical problems via Google sheets or its equivalent. Hand written assignments will not be accepted.

Students are encouraged to discuss the homework assignments, but the final submission must be the student's independent work.

Software
Some homework assignments will require the use of Google sheets or its equivalent.

Dates

- Week 7: **Review and midterm exam** (Wednesday, 18th October)

- Week 15: **Final review**

Topics

- **Basic statistics** [Chapter 1-3]
    - Types of data
    - Scales of measurement: nominal, ordinal, interval, ratio
    - Population vs. sample
    - Frequency distribution and relative frequency
    - Graphs, charts, histograms
    - Cross-tabulations
    - Measuring location: mean, median, and mode
    - Measuring variability: range, variance, standard deviation, skewness
    - Measuring association between two variables: covariance and correlation coefficient
- **Probability** [Chapter 4.1-4, 5.1-5, 6.1-3]
    - Counting rules for combinations and permutations
    - Assigning probabilities
    - Tree diagrams and Venn diagrams
    - Complement, union, intersection, mutually exclusive events
    - Conditional probability and independent events
    - Discrete and continuous random variables
    - Expected value and variance
    - Discrete probability distributions
    - Continuous probability distributions
- **Statistical inference** [Chapter 7.1-5; 8.1-3; 9.1-4; 10.1-3; 11.1-2; 12.1-3]
    - Simple random sample compared to other types of sampling
    - Properties of sampling distributions
    - Central limit theorem
    - Margins of error and confidence intervals
    - Calculating interval estimates for population mean
    - Determining the sample size for a given margin of error
    - Hypothesis testing
    - Differences between two population means
    - Tests of goodness of fit and independence
- S**imple linear regression** [Chapter 14]
    - Independent and dependent variables
    - Regression model and equation
    - Least squared method
    - Sums of squares
    - Coefficient of determination
    - Assumptions about error terms

- Residual plots
- Autocorrelation
- Outliers and influential observations