ECON 321: Economic Statistics

University of Maryland, Fall 2015.
Section 0101, MWF 2:00 – 2:50 (LEF, Room 2205)

Dr. S Verma
Email: Verma@econ.umd.edu or SVermaPRC@gmail.com
Office: Morrill Hall 1102C
Office Hours: 1:00 to 2:00
Graders: Yue Chao; Hao Bo (Office Hrs: tbd)
Tutors: Si Shi; Doraine Tchenga; Yimin Wang (Office Hrs: tbd)

Recommended Text:
Statistics for Business and Economics by David R. *Anderson, Dennis J. Sweeney, and Thomas A. Williams,* 13th Edition (or latest), South-Western Publishing (www.cengage.com)

The text book is expensive and therefore it is only recommended. Try to get an Online version. However, I have put several books on reserve in the library where one can borrow for 2 hrs.

Exams:

First Exam	20%	Date: October 14 (40 points)
Second Exam	20%	Date: November 9 (40 points)
Topical assignments	20%	Three Topical Assignments (10 + 10 + 20 points)
Final Exam	40%	December 17, 1:30 – 3:30 (80 points)

Course grade will be determined by adding all the points (out of 200). Makeup exam will be given only with a valid excuse as per University policy. For details visit http://www.testudo.umd.edu/soc/atedasse.html.

Attendance:
Attending class is utmost important for topical assignments. Exams will be based on material covered in the class *plus* assignments. Laptop and calculator will be needed in the class.

Objective:
The objectives of this course is to provide in-depth understanding of statistical concepts used in research. Students would acquire the ability to perform descriptive statistical calculations using Excel and SPSS. They would also learn to calculate and interpret statistical concepts such as simple probability, Bayes Theorem; discrete probability distributions (Binomial and Poisson distribution); Normal distribution -- point and interval estimations; and hypothesis testing of means, proportions, difference of means and proportions, and variances. Students would be able to perform one-way and two-way analysis of variance, estimate simple linear regression using calculators, and multiple regression model using SPSS. Students would be introduced to binary discrete choice (logit models) models.

Part I: Foundation and Descriptive Statistics

Topics:

1. Types of Data: Interpretation and manipulation of data – Excel and SPSS
   Read Text Book -- Chapter 1
2. Descriptive Statistics: Text Chapter 2 and 3. Concept of Mean, Mode, Median, Quartiles, Percentiles, Standard Deviation, and Correlation.

A calculator is needed in class. Calculation of descriptive statistics using SPSS.

Part II: Probability and Probability Distributions

Topics:

3. Introduction to Probability: Text Chapter 4. Concept of probability, Additive and Multiplicative law, Conditional probability. Bayes' Theorem
   (*Calculator is needed in class.)*
4. Discrete Random Variables: Chapter 5. Expected Value. Variance and Covariance. Binomial and Poisson distribution. (*Calculator is needed in class.)*
5. Continuous Random Variables: Text Chapter 6. Normal Distribution, Normal curve, computing probabilities for any Normal curve. (*Calculator is needed in class.)*

(Topical Assignment -- 10 points)

Part III: Statistical Inference

Topics:

6. Sampling and Sampling Distributions: Text Chapter 7. Types of Samples. Point estimation. Sampling Distribution of Mean and Proportion; Central Limit Theorem.
7. Intervals Estimation: Text Chapter 8. Confidence interval of mean and proportion.
8. Hypothesis Testing: Text Chapter 9. Null and Alternative Hypotheses. Testing of Means, Proportions, and Variances. (t-distribution; Chi-square distribution)
9. Type and Type II errors. Determining sample size.
9. Testing difference of means and proportions of two populations: Text Chapter 10.
10. Testing of variances -- Chi-square and F distribution: Text Chapter 11 and 12. Test of Independence.
11. Analysis of Variance (ANOVA): Text Chapter 13. Introduction to Experimental Design; One Way and two-way ANOVA. ANOVA by using SPSS.

Calculators/laptops are needed in class. SPSS will be used to test hypotheses using large datasets.
(Topical Assignment -- 10 points)

Part IV: Regression Analysis

10. Simple Linear Regression Model: Text Chapter 14. Method of least squares. Assumptions and estimation of model coefficients, goodness of fit and forecasting.

    Calculator or Excel needed for simple regression. SPSS will be used for Multiple Regression models using large datasets.

11. Interpretation and estimation of Multiple Regression Models. Text Chapter 15. Introduction to multiple regression and binary logit regression (Using SPSS); Introduction to problems in estimating regression models.

    (Topical Assignment on Multiple Regression and Hypothesis Testing using SPSS -- 20 points)

SPSS is available on OACS lab. Students need NOT buy any manual for SPSS. Class instructions will be sufficient and will be provided by the instructor. Thus attending classes regularly would be crucial to learn statistical concepts and its applications in research.

Grading:

Letter grade for the course will be determined by adding all the points (out of 200) as per following table:

Above 95% = A+	Between 90% and 95% = A	Between 87% and 90% = A-
Between 85% and 87% = B+	Between 80% and 85% = B	Between 77% and 80% = B-
Between 75% and 77% = C+	Between 70% and 75% = C	Between 67% and 70% = C-
Between 65% and 67% = D+	Between 60% and 65% = D	Below 60% = F

There will be absolutely zero opportunities to earn extra credit after the final exam.