BOSTON COLLEGE
Department of Economics

Statistics   Soner Tunay
EC 151.10-11   Carney 33B
Spring 1999   x2-8704
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This is an introductory course in statistics. Contrary to some belief, Statistics is neither simple-minded formula crunching nor pure mathematical manipulation. Instead, statistics is the science of collecting, summarizing and interpreting the data. In this course you will learn how to apply statistics to the real life problems. Statistical concepts will be taught with applications in mind. The course has three major sections: Descriptive statistics, probability and distributions and statistical inference.

Office Hours: Tue. and Thu. 4:30-5:30 PM.

Text: Keller and Warrack: Statistics for Management and Economics, abbreviated forth ed., Wardswoth, 1998 (required).
Study Guide (required).
Student's Solution Manual (recommended).

Course requirements: Quizzes (total of 4, 5% each), 1st exam (20%) 2nd Exam (20%), final exam (30%), homework and class participation (10%).

Examination: The 1st exam will be on Tue. Feb. 8th and the second one on Thu., April 22nd during regular class time. The time and location of the final exam is announced by the registrar and you should be able to check it on U-view.
In addition, there will be 4 quizzes. Shall you miss a quiz; you will get a zero for that one. You could only be excluded from a quiz if you have a doctor's note, just like a regular exam.

Course organization and expectations: The class meets two times a week (Sec 10: 1:30-3:00, Sec 11: 3:00-4:30 Tue. and Thu.) in O'Neill 247. There will be problem sets almost every week. Moreover, I will try to provide some computer assignments to introduce you to spreadsheet computing. I will not accept the ones that are not returned on time. I encourage small group study on problem sets so long as everyone contributes to the problem solving equally. I believe that teamwork improves your abilities to share ideas and learn from others. Naturally, you will be evaluated from your own work on the exams.
The structure of the course will follow the textbook closely. You are required to read the assigned sections in the textbook. I also believe that a quick glance at the topics before each class helps you to learn the material faster.

Syllabus

Introduction to Statistics (Ch. 1)
Descriptive Statistics (Ch. 2,4)
      i) Measures of central tendency (4.2)

- Mean
- Mode
- Median

      ii) Measures of dispersion (4.3, 4.4)

- Range
- Variance
- Standard Deviation
- Coefficient of Variation
- Interpreting Standard Deviation

      iii) Measures of association (4.6)

- Covariance
- Coefficient of Correlation

      iv) Graphical descriptions: Histograms (2.3)

Probability (Ch. 6)
      i) Probability Rules and Random Events (6.2, 6.3)

- Random Experiment
- Assigning Probabilities
- Concepts of Probability

      ii) Probability Distributions (6.4)
      iii) Conditional Probability and Probability Trees (6.2, 6.3)

- Conditional Probability
- Probability Trees

      iv) Expected Value and Variance (6.5)

- Laws of Expected Value
- Laws of Variance

      v) Binomial Distribution (6.7)

- Binomial Experiment
- Using Binomial Tables

Continuous Random Variables and Probability Distributions (Ch. 7)
      i) Probability Distributions for Continuous Random Variables (7.2)

- Uniform Distribution

      ii) The Normal Distribution (7.3)

- Finding Normal Probabilities

Sampling Distribution (Ch. 8)
      i) Sampling Distribution of the Sample Mean (8.2)

- Central Limit Theorem

Point Estimation (Ch. 9)

  i) Properties of Estimators (9.2)

    • Unbiasness, Efficiency and Consistency

Interval Estimation (Ch. 9, 11)

  i) Confidence Intervals (9.2, 9.3)

    • Confidence Interval Estimation

    • Interpreting Confidence Interval Estimate

  ii) Student's t distribution (11.1, 11.2)

Hypothesis Testing (Ch. 10, 11)

  i) Concepts of Hypothesis Testing (10.2)

  ii) Tests of the Mean (10.3, 11.2 p.376)

    • When the Population Variance is Known (10.3)

    • When the Population Variance is Unknown (in Ch. 11)

  iii) The p-value of a Test of Hypothesis

    • Interpreting the p-value

    • Using the p-value to Draw Conclusions

  iv) Calculating the Probability of a Type II Error (10.5)

  iii) Tests for the Difference Between Two Means (12.2) - if time allows