#### **KARATINA UNIVERSITY**

SCHOOL OF BUSINESS

#### **ARE 112: INTRODUCTION TO ECONOMIC STATISTICS**

***COURSE PURPOSE***

The course aims at equipping the student with skills in statistical analysis for making decisions. The course aims at building an understanding of statistics- not merely plugging numbers into formulas, as has been a silent tradition in the study of quantitative subjects.

***COURSE LEARNING OUTCOMES***

*At the end of the course, the learner should be able to;*

1. Visualize data using appropriate tools.
2. Master the Basics of R programming language for statistics.
3. Summarize data using the variety of measures.
4. Design instruments for data collection.
5. Make inference using data.
6. Build basic models using data.

***COURSE CONTENT***

* Exploring and collecting data.
  + Definitions and background.
  + Statistics and Variation.
  + Data: Data types and Sources
  + Surveys and Sampling.
  + Introduction to R and R-Studio
* Data Visualization.
  + Displaying and describing categorical data.
  + Displaying and describing quantitative data.
  + Plotting data in base R.
  + Introduction to the Tidyverse and GGPLOT plotting in R.
* Summarizing data.
  + Summarizing categorical data.
  + Summarizing quantitative data.
    - Measures of center.
    - Measures of spread.
  + Summarizing data using R and the Tidyverse.
  + Writing a statistics based report in R Markdown.
* Randomness and probability.
  + Random phenomena and probability.
  + The non-existent law of averages.
  + Different types of probability.
  + Probability rules.
  + Joint probability and contingency tables.
  + Conditional probability.
  + Constructing contingency tables.
* Random variables and probability models.
  + Expected value of a random variable.
  + Standard deviation of a random variable.
  + Properties of expected values and variances.
  + Discrete probability distributions.
* The normal distribution.
* Sampling distributions.
  + Confidence intervals for proportions.
  + Confidence interval for means.
* Parametric Inference for decision making.
  + Testing hypotheses.
  + Comparing two groups.
  + Inference for counts: The Chi- Square tests.

***MODE OF DELIVERY OF THE COURSE***

The course will be delivered using a combination of lectures, discussions based on case studies and class presentations by students.

***INSTRUCTIONAL MATERIALS/ EQUIPMENT***

Lecture notes, course texts, case studies, computers (with internet connectivity), projectors, white board and markers.

***COURSE ASSESSMENT***

The course will be assessed through a combination of continuous assessment tests, class assignments and final exam as follows.

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| --- | --- |
| Assessment Type | Contribution to final score |
| Continuous assessment tests | 20 |
| Class assignments/ group work | 10 |
| Final exam | 70 |
| TOTAL | 100 |

***READING MATERIALS FOR THE COURSE***

# CORE TEXT

N., S., De Veaux, R., & Velleman, F. (2012). *Business statistics, Second Edition.* New York: Addison Wesley.

Lecture notes

Other texts in economic/ business statistics are also useful