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Norton University
College of Social Sciences

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Lecturer's Name   **:** **Mr. Mong Mara**

Course Name   **:** Introduction to Statistics

Year   **:** 2

Credit Point   **:** 3

Prerequisites   **:** Knowledge of elementary algebra

Co-requisites   **:** Nil

Course Aim and Purpose: This course is designed for students in the college of social science in year 2. It provides knowledge and understanding of descriptive statistics, basic probability and probability distribution.

Student Learning Outcomes

After completing this course, students will be able to

▸ Define what is meant by statistics, descriptive and inferential statistics.
▸ Distinguish between a qualitative variable and a quantitative variable and between a discrete variable and a continuous variable.
▸ Distinguish among the nominal, ordinal, interval, and ratio levels of measurement.
▸ Describe the data by frequency distribution, graphic presentation, measures of location and dispersion.
▸ Define probability and calculate probability.
▸ Define probability distribution.
▸ Describe the characteristics and compute probabilities using the binomial, hyper geometric, Poisson distribution and Normal probability distribution.

Content of Courses (Syllabus Content)

▸ Chapter 1   : What is statistics?
  - Introduction
  - What is meant by statistics?
  - Types of statistics
    -Descriptive Statistics
    -Inferential Statistics
  - Types of variables
    -Discrete variable
    -Continuous variable
  - Source of statistics data
  - Level of Measurement
    -Nominal Level Data
    -Ordinal Level Data
    -Interval Level Data
    -Ratio Level Data

▶ Chapter 2 : Describing Data: Frequency Distributions and Graphic Presentation
- Introduction
- Constructing a frequency distribution
    - Class Intervals and Class Midpoints
    - Suggestions on Construction Frequency Distribution
- Relative Frequency Distribution
- Stem-and-leaf Displays
- Graphic Presentation of a Frequency Distribution
    - Histogram
    - Frequency Polygon
    - Less-Than Cumulative Frequency Polygons
- Other Graphic Presentations of Data

▶ Chapter 3 : Describing Data: Measures of Locations
- Introduction
- The Population Mean
- The Sample Mean
- The Properties of the Arithmetic Mean
- Weighted Mean
- The Median
- The Mode
- The Geometric Mean
- The Mean, Median, and Mode of Group Data
    - The Arithmetic Mean
    - The Median
    - The Mode
- Selecting an Average for Data in a Frequency Distribution

▶ Chapter 4 : Describing Data: Measures of Dispersion
- Introduction
- Why Study Dispersion?
- Measures of Dispersion
    - Range
    - Mean Deviation
    - Variance and Standard Deviation
- Measures of Dispersion for Data Grouped into a Frequency Distribution
    - Range
    - Standard Deviation
- Interpretation and Uses of the Standard Deviation
    - Chebyshev's Theorem
    - The Empirical Rule
- Relative Dispersion
- Skewness
- Other Measures of Dispersion
    - Quartiles
    - Deciles
    - Percentiles
- Box Plots

▶ Chapter 5 : A Survey of Probability Concepts
- Introduction
- What is a Probability?

- Approaches to Probability
  - Classical Probability
  - Empirical Concept
  - Subjective Probability
- Some Rules of Probability
  - Rule of Addition
  - Rule of Multiplication
- Tree Diagrams
- Bayes's Theorem
- Principle of Counting
  - The Multiplication Formula
  - The Permutation Formula
  - The Combination Formula

▸ Chapter 6 : Discrete Probability Distribution
  - Introduction
  - What is a Probability Distribution?
  - Random Variables
    - Discrete Random Variable
    - Continuous Random Variable
  - The Mean, Variance, and Standard Deviation of a Probability Distribution
    - Mean
    - Variance and Standard Deviation
  - Binomial Probability Distribution
    - How Is a Binomial Probability Distribution Constructed?
    - Using Binomial Probability Tables
    - Cumulative Probability Distributions
  - Hyper-geometric Probability Distribution
  - Poisson Probability Distribution
▸ Chapter 7 : The Normal Probability Distribution
  - Introduction
  - The Family of Normal Probability Distributions
  - The Standard Normal Probability Distribution
  - The Normal Approximation to the Binomial

Learning and Teaching Strategies
  ▸ Classroom instruction
  ▸ Small group discussion/practice
Assessment Methods
  ▸ Class participation, acceptance, and discipline   5%
  ▸ Mid-Term exam   15%
  ▸ Project works and Assignment   20%
  ▸ Final Examination   60%

Class and Activities Schedule:

Session	Chapter	Topic	Other
1	**1**	- Introduction - What is meant by statistics? - Types of statistics -Descriptive Statistics	

		-Inferential Statistics
		- Types of variables
		     -Discrete variable
		     -Continuous variable

2	**1**	**-** Source of statistics data
		- Level of Measurement
		     -Nominal Level Data
		     -Ordinal Level Data
		     -Interval Level Data
		     -Ratio Level Data
		- Exercises

3	**2**	**-** Introduction **-** Constructing a frequency distribution **-** Class Intervals and Class Midpoints **-** Suggestions on Construction Frequency Distribution **-** Relative Frequency Distribution **-** Stem-and-leaf Displays
4	**2**	Exercises

5	**2**	**-** Graphic Presentation of a Frequency Distribution
		     - Histogram
		     - Frequency Polygon
		     - Less-Than Cumulative Frequency Polygons
		- Other Graphic Presentations of Data

6	**2**	Exercises
7	**3**	**-** Introduction **-** The Population Mean **-** The Sample Mean **-** The Properties of the Arithmetic Mean **-** Weighted Mean **-** The Median **-** The Mode
8	**3**	Exercises

9	**3**	**-** The Geometric Mean
		- The Mean, Median, and Mode of Group Data
		     - The Arithmetic Mean
		     - The Median
		     - The Mode
		- Selecting an Average for Data in a Frequency Distribution

10	**3**	Exercises

11	**4**	**-** Introduction
		- Why Study Dispersion?
		- Measures of Dispersion
		     - Range
		     - Mean Deviation
		     - Variance and Standard Deviation
		- Measures of Dispersion for Data Grouped into a Frequency Distribution
		     - Range

		- Standard Deviation	
12	**4**	Exercises	

13	**4**	- Interpretation and Uses of the Standard Deviation
		   - Chebyshev's Theorem
		   - The Empirical Rule
		- Relative Dispersion
		- Skewness
		- Other Measures of Dispersion
		   - Quartiles
		   - Deciles
		   - Percentiles
		- Box Plots	

14	**4**	Exercises	
15		Mid-term Review	
16		Mid-term Examination	

17	**5**	- Introduction
		- What is a Probability?
		- Approaches to Probability
		   - Classical Probability
		   - Empirical Concept
		   - Subjective Probability	

18	**5**	Exercises	

19	**5**	- Some Rules of Probability
		   - Rule of Addition
		   - Rule of Multiplication
		   - Tree Diagrams
		   - Bayes's Theorem	

20	**5**	Exercises	

21	**5**	- Principle of Counting
		   - The Multiplication Formula
		   - The Permutation Formula
		   - The Combination Formula	

22	**5**	Exercises	
23	**6**	- Introduction - What is a Probability Distribution? - Random Variables - The Mean, Variance, and Standard Deviation of a Probability Distribution	
24	**6**	Exercises	

25	**6**	- Binomial Probability Distribution
		   - How Is a Binomial Probability Distribution Constructed?
		   - Using Binomial Probability Tables
		   - Cumulative Probability Distributions	

26	**6**	- Hypergeometric Probability Distribution - Poisson Probability Distribution	
27	**6**	Exercises	
28	**7**	- Introduction - The family of Normal Probability Distributions	

		Applications of the Standard Normal Distribution.	
29		Area Under the Normal Curve	
30		Exercises	
31		Normal Approximation to the Binomial	
32		Exercises	

Required Student Tasks/Assignments:

Each group of 5 students must choose a topic of project/ assignment.

Learning Resource

Main book

Robert D. Mason, Douglas A. Lind, and William G. Marchal, ***Statistical Techniques in Business and Economics,*** USA, McGraw-Hill, 10th edition, 1999.

Supporting books

- Allan G. Bluman, ***Elementary Statistics,*** USA, McGraw-Hill, fifth edition, 2004
- Douglas A. Lind, Robert D. Mason, and William G. Marchal, ***Basic Statistics for Business and Economics,*** USA, McGraw-Hill, third edition, 2000
- Mario F. Triola, ***Elementary Statistics,*** USA, fourth edition, 1989
- Sheldon P. Gordon and Florence S. Gordon, ***Contemporary Statistics***, USA, McGraw-Hill, 1994

Websites

http://www.mhhe.com/business/opsci/bstat/
http://en.wikipedia.org/wiki/Statistics