Course title: Introductory Statistical Methods			
Course code: UEO 104	**No. of credits:** 4	**L-T-P:** 44-12-8	**Learning hours:** 60
Pre-requisite course code and title: N/A			
Department: Department of Policy and Management Studies			
Course coordinator: Dr. Malvika Tyagi	**Course instructor:** Dr. Aditi Singhal/Dr. Priyanka Arora		
Contact details: aditi.singhal@terisas.ac.in/priyanka.arora@terisas.ac.in			
Course type: Core	**Course offered in** : Semester 2		

Course description:
This course is an introduction to the statistical tools that are widely used in various areas of economics. The course will cover elementary probability theory, discrete and continuous random variables, joint probability distribution and descriptive statistics.

Course objective:
1. To familiarize the students with the core concepts and techniques of statistics that are used in economics.
2. To introduce the key concepts of probability theory.
3. To help students apply these techniques in economic applications.

Course contents

Module.	Topics	L	T	P
1	**Introduction and Overview** • Application of statistics in Economics • Data- elements, variables and observations • Scales of measurement of data • Types of data- categorical, quantitative, cross-sectional and time series • Distinction between population and sample	6	1	0
2	**Elementary Probability Theory** • Sample spaces and events (concepts and definitions using set theory) • Conditional probability • Bayes' theorem and its applications.	14	4	0
3	**Measures of central tendency** • Mean, weighted mean, geometric mean, harmonic mean • Median, mode • Quartiles, Deciles and Percentiles	8	3	0
4	**Descriptive Statistics** • Representation of data- graphical (dot plot, line diagram, bar diagram, scatter diagram and trendline, histogram, pie chart) and tabular method • Frequency Distribution • Relative frequency and percent frequency distributions • Cumulative distribution • Distribution shape, z-Scores , Chebyshev's Theorem, detecting outliers • Dispersion (range, inter-quartile range, variance, standard deviation, coefficient of variation) • Moments, Skewness and Kurtosis (definition, computation) To introduce students to analysing data using R/Stata	8	1	8
5	**Correlation and Regression** • Types of correlation • Karl Pearson's coefficient of correlation • Spearman's rank correlation • Properties of correlation • Introduction to regression • Regression of Y on X • Regression of X on y Coefficient of determination and goodness of fit	8	3	0

	Total (in hours)	44	12	8

Pedagogical approach:
Classroom teaching and problem-solving sessions.

Evaluation criteria:
1. Minor 1: Written Examination - 20% [Syllabus: Module 1]
2. Minor 2: Written Examination - 20% [Syllabus: Module 2-3] Assignment
3. Homework (software based)- 20% [Syllabus: Module 5] Major: Written
4. Examination - 40% [Entire Syllabus]

Learning outcomes:
At the end of the course, the students will be able to:
1. Understand the core statistical concepts. [Minor 1, Minor 2, Assignment, Major]
2. Understand the key concepts of probability theory. [Minor 2]
3. Apply the techniques learned during the course in economic problems. [Minor 1, Minor 2, Assignment Major]
4. Provide economic interpretations of the statistical results. [Minor 1, Minor 2, Assignment, Major]

Core reading:

1. Spiegel, M.R.,Stephens, L. J. (2018). Schaum's Outline of Statistics. McGraw-Hill Education (SS)

2. Anderson, D. R, Sweeny, D. J, et.al (2019), Statistics for Business and Economics, 13th edition, Cengage Learning (AS)

Module-wise chapters from the core readings:
1. Module 1: AS, Chapter 1, Sections 1.1-1.5 or SS, Chapter 1 & 2
2. Module 2: AS, Chapter 4, Sections 4.1-4.5 or SS, Chapter 3, 4, 5 & 6
3. Module 3: AS, Chapter 5, Sections 5.1-5.7, 6.1-6.2 or SS, Chapter 2 (Grouped data) & 8
4. Module 4: AS, Chapter 2, Sections 2.1-2.4 & Chapter 3, Sections 3.1-3.3, 3.5 or SS, Chapter 2, 7, 9 & 10
5. Module 5: SS, Chapter 14

Student responsibilities:
Attendance, feedback, discipline: as per university rules.

Course prepared by: Dr. Aditi Singhal

External Reviewers:

- Divya Gupta, Associate Professor, O.P. Jindal Global University
- Sonal Dua, Associate Professor, O.P. Jindal Global University