Course title: Intermediate Statistical methods for economics			
Course Code: UEO 204	**No of credits**: 4	**L-T-P:** 44-16-0	**Learning Hours**: 60
Pre-requisite course code and Title: Introductory Statistical Methods (UEO 104); Statistics for Data Science (UDS 101); Mathematics for Data Science (UDS 103); Problem Solving and Python Programming (UDS 102); Environmental Statistics (MDC 201)			
Department: Department of Policy and Management Studies			
Course coordinator: Dr. Malvika Tyagi		**Course Instructor:** Guest Faculty	
Contact Details: malvika.tyagi@terisas.ac.in			
Course Type: Core		**Course offered in:** Semester 4	

Course Description: This course is a follow-up course on the introductory course on statistical methods. The course covers different types of probability distributions, introduce students to different types of samples, and to various hypothesis testing procedures. The course also provides a basic understanding of simple linear regression model.

Course Objective:

1. Building on the foundations of previous course on statistics, the intent of this one is to familiarise students with different type so discrete and continuous probability distributions.
2. To familiarize them with joint probability distributions
3. To introduce them to the distinction between population and samples and consequently discuss the notion of hypothesis testing in case of large samples and small samples.

Course contents:

S.N.	Topics	L	T	P
1	Population, Samples and Processes • Sample spaces and events • Conditional probability • Independence	4	1	
2	Discrete random variables • Probability distributions of discreet random variables • Expected values • Binomial, hypergeometric and negative binomial, Poisson	8	2	
3	Continuous random variables • Probability density functions • Cumulative distribution functions • Expected values • Normal distribution • Exponential and gamma distribution	8	2	
4	Joint probability distributions • Jointly distributed random variable • Expected values, covariance and correlation	6	2	
5	Sampling • Meaning, objective and methods • Central Limit theorem	2	1	
6	Point estimation and interval estimation • type 1 errors ,type 2 errors and p-values • with sessions on R	4	2	
7	Hypothesis testing Large sample tests	6	3	

	• For specific means and proportion • For equality of means and proportions • with sessions on R			
8	Hypothesis testing small sample tests (when population standard deviation is known and when it is unknown) • For specific means and proportion • For equality of means and proportions • with sessions on R	6	3	
Total		**44**	**16**	
Pedagogical Approach: Classroom teaching and problem solving sessions				
Evaluation Criteria: Minor 1: Written examination (Module 1, 2 , and 3) – 30% Minor 2: Written examination (Module 4, 5 , and 6) – 30% Major : Written examination (Module 1 to 8) – 40%				
Learning Outcomes: At the end of the course the student must be able to: • Understand differences in various probability distributions – discrete, continuous as well as joint. (Based on Minor 1 and Minor 2) • Should be able to formulate hypothesis and be able to employ adequate testing methods. (Based on Major)				
Core Readings: Devore, Jay L. *Probability and Statistics for Engineering and the Sciences, Brooks /Cole (2009)* Freund, John E., and Benjamin M. Perles. *Modern Elementary Statistics: Pearson New International Edition*. Pearson Higher Ed, 2013.				
Module wise chapters from the core readings Module 1: Devore, Chapter 1 Module 2: Devore, Chapter 2 and 3 Module 3: Devore, Chapter 4 Module 4: Devore, Chapter 5 Module 5: Freund and Perles, Chapter 10 Module 6: Devore, Chapter 6 Module 7: Devore, Chapter 8 and 9 Module 8: Devore, Chapter 9				
Additional information : Course prepared by Dr. Aditi Singhal				
Student responsibilities: Attendance, feedback, discipline: as per university rules				

Course reviewers:

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Dr. Apoorva Gupta, Assistant Professor, Hansraj College, University of Delhi