Semester Lecture Plan

Name of the college: Government college of Arts Science and Commerce ,Sankhali

Name of Faculty: Ms. Shraddha Fatrekar	**Subject:** Mathematics	
Paper code: MAT-626	**Program/Course: M.Sc. Part II**	**Division:**
Academic year: 2024- 2025	**Semester:III**	**Total Lectures: 60**

Course Objectives:
The aim of course is to familiarize students with the fundamental concepts & techniques in Probability theory and Statistical analysis.

Expected course Outcome:

Student will be able to

1. get familiarized with basic properties of random variables, probability distributions.
2. understand basic concepts in Statistics,
3. understand how to collect, arrange, present, summarize and analyze statistical data,
4. understand to arrive at statistical inferences, apply appropriate statistical tests and interpret its results

Student learning outcome: The student will be able to get familiarize with fundamental concepts and techniques in probability theory and statistical analysis.

Month	Lectures From:	To:	No. of lectures allotted	Topic, Subtopic to be covered	Exercises/ assignment	ICT Tools	Reference books
July	15/07/2024	20/07/2024	06	1. **Data Handling**: Tabulation and frequency distribution, relative frequency distribution, cumulative frequency distribution		Smarboard, PDF	Fundamentals of Mathematical Statistics by S.C.Gupta and V.K.Kapoor

				2. Measures of central tendency & dispersion: Arithmetic mean, Median,			
July	22/07/2024	27/07/2024	04	Mode for raw data, grouped data, relationship between mean, median and mode, quartiles deciles, percentiles.		Smarboard, PDF	Fundamentals of Mathematical Statistics by S.C.Gupta and V.K.Kapoor
August	29/07/2024	03/08/2024	04	Variability, range, mean deviation, coefficient of mean deviation, standard deviation, variance, coefficient of variance.		Smarboard, PDF	Fundamentals of Mathematical Statistics by S.C.Gupta and V.K.Kapoor
	05/08/2024	10/08/2024	04	skewness, Karl Pearson's coefficient, Bowley's coefficient. **3. Various Concepts in Probability Theory:** Sample spaces, events,			Fundamentals of Mathematical Statistics by S.C.Gupta and V.K.Kapoor
	12/08/2024	17/08/2024	04	permutations and combinations, axioms of probability,			Fundamentals of Mathematical Statistics by S.C.Gupta and V.K.Kapoor
	19/08/2024	24/08/2024	04	conditional probability, independence and multiplication rule, Baye's Theorem.			Fundamentals of Mathematical Statistics by S.C.Gupta and V.K.Kapoor

	26/08/0202 4	31/08/2024	04	**4. Discrete Distributions:** Random variables, discrete probability densities, cumulative distribution, expectation			Fundamentals of Mathematical Statistics by S.C.Gupta and V.K.Kapoor
September	02/09/2024	07/09/2024	04	variance and standard deviation. Binomial, Geometric and Poisson distributions.		Smarboard, PDF	Fundamentals of Mathematical Statistics by S.C.Gupta and V.K.Kapoor
	09/09/2024	14/09/2024	04	**5. Continuous Distributions:** Continuous densities, cumulative distribution and distribution parameters, uniform, normal, standard normal,			Fundamentals of Mathematical Statistics by S.C.Gupta and V.K.Kapoor
	16/09/2024	21/09/2024	04	Gamma, exponential and Chi-squared distributions. Normal approximation to binomial distribution.			Fundamentals of Mathematical Statistics by S.C.Gupta and V.K.Kapoor
	23/09/2024	28/09/2024	04	**6. Descriptive Statistics and Estimation:** Random sampling, sample statistics, point estimation sampling distribution of a statistic, distribution of the sample mean and the Central Limit Theorem.			Fundamentals of Mathematical Statistics by S.C.Gupta and V.K.Kapoor

October	30/09/2024	05/10/2024	04	**7. Statistical Inference**: determining sample size, estimation of mean and proportions, Student-t distribution, confidence interval, hypothesis testing on the mean and proportion, type I, type II errors, power of the test, Z-test, t-test, F-test		Smarboard, PDF	Fundamentals of Mathematical Statistics by S.C.Gupta and V.K.Kapoor
	07/10/2024	12/10/2024	04	**8. Simple linear regression and correlation:** Linear regression analysis, model and parameter estimation by least-squares method, Properties of least square estimators, confidence interval estimation and hypothesis testing,			Fundamentals of Mathematical Statistics by S.C.Gupta and V.K.Kapoor
	14/10/2024	19/10/2024	04	Pearson's correlation coefficient, covariance, coefficient of determination **9. Other tests**: ANOVA,			Fundamentals of Mathematical Statistics by S.C.Gupta and V.K.Kapoor
	21/10/2024	23/10/2024	02	non-parametric tests, Chi-square tests			Fundamentals of Mathematical Statistics by S.C.Gupta and V.K.Kapoor

*** Assessment Rubrics**

Component	Max Marks
ISA 1	20
ISA 2	20
ISA 3	20
Project	-
Semester End Exam	40