ANDHRA LOYOLA INSTITUTE OF ENGINEERING AND TECHNOLOGY

Department: MBA

Subject: QUANTITATIVE TECHNIQUES FOR BUSINESS DECISIONS

Teacher: Mrs. V. NAGA LAKSHMI

Academic Year: 2020-21   **Year/Semester:** I--I

Course Outcomes:

	DESCRIPTION	Bloom's Level
	At the end of this course the student will able to:	
CO1	Apply quantitative methods to analyse social science data and to understand other people's use of these methods	Factual, Conceptual & Applied
CO2	knowledge of various types of data, their organisation and evaluation of summary measures such as measures of central tendency and dispersion etc., learn the notion of conditional probability including the concept of Bayes' Theorem	Factual, Conceptual & Applied
CO3	To comprehend the decision making process under uncertainty using statistical tools	Factual, Conceptual & Applied
CO4	To understand the meaning and process of hypothesis testing including one-sample and two-sample tests	Factual, Conceptual & Applied
CO5	To appreciate the importance and application of non-parametric tests in hypothesis testing.	Factual, Conceptual & Applied

Text book References:

Text book -1: "Quantitative Techniques" , Dr. C. Satya Devi, S.Chand

Text book-2: Complex Variables & Statistical Methods, Dr.T.V.Itengar, Dr. B. Krishan Gandhi, S. Ranganatham, Dr. MVSSN. Prasad, S.Chand

Text book-3: "Probability & Statistics" , K.Murugesan, P.Guru Swamy, S.Chand

Text book-4: "Operations Research", Kanthi Swarup, PK. Gupta, ManMohan, S.Chand

Text book-5: "Mathematical Foundations of Computer Science" Dr.DSC, Prism

Text book-6: "Probability & Statistics", William Mendenhall, Rober,J, Beaver, Barbara M Beaver, Cengage Learning

Contents/Activities:

1	**Factual:** Factual knowledge consistbasic information about a particular subject or discipline that students must be acquainted with. This may include the terminology and the specific details or elements of a subject	Basic Mathematical & Statistical Techniques, Linear, Quadratic, Logarithmic and Exponential Functions, Permutations and Combinations, Matrices - Elementary operations of matrices (Unit-1)
		Measures of Central Tendency – Measures of Dispersion –Simple Correlation and Regression Analysis, Concept of Probability (Unit-2)
		Introduction to Decision Theory (Unit-3)
		Sampling and Sampling Distributions – Estimation – Point and Interval Estimates of Averages, and proportions of small and Large Samples (Unit-4)
		Tests Two Samples **–**Tests of Difference between Mean and Proportions of Small and Large Samples – Chi-square Test of Independence and Goodness of Fitness-Analysis of Variance (Unit-5)
2	**Conceptual:** Conceptual knowledge consists of knowledge of, or understanding of concepts, principles, theories, models, classifications, etc. We learn conceptual	Probability Rules – Joint and Marginal Probability – Baye's Theorem (Unit-2)
		Different environments in which decisions are made, Criteria for Decision Making (Unit-3)

	knowledge through reading, viewing, listening, experiencing, or thoughtful, reflective mental activity.	Concepts of Testing Hypothesis (Unit-4)
3	**Procedural:** Procedural knowledge is the knowledge exercised in the performance of some task.	Probability Distributions- Binomial, Poisson, Normal and Exponential Probability Distributions(Unit-2) Steps involved in Decision Making, Decision making under uncertainty, Decision making under conditions of Risk-Utility as a decision criterion, Decision trees, Graphic displays of the decision making process, Decision making with an active opponent (Unit-3) One Sample Test for Testing Mean and Proportion of Large and Small Samples(Unit-4) Tests Two Samples –Tests of Difference between Mean and Proportions of Small and Large Samples – Chi-square Test of Independence and Goodness of Fitness- Analysis of Variance (Unit-5)
4	**Applied:** Applied knowledge is learning that is used in various situations and contexts.	Linear, Quadratic, Logarithmic and Exponential Functions, Permutations and Combinations (Unit-1) Measures of Central Tendency – Measures of Dispersion –Simple Correlation and Regression Analysis(Unit-2) Decision making under uncertainty, Decision making under conditions of Risk-Utility as a decision criterion, Decision trees, Graphic displays of the decision making process (Unit-3) Sampling and Sampling Distributions – Estimation – Point and Interval Estimates of Averagesand proportions of small and Large Samples, One Sample Test for

| | | Testing Mean and Proportion of Large and Small Samples (Unit-4)

Tests Two Samples –Tests of Difference between Mean and Proportions of Small and Large Samples – Chi-square Test of Independence and Goodness of Fitness-Analysis of Variance (Unit-5) |

Schedule and Sequence:

Day	Topic	Objectives	Before Class-Videos, e-Books, Case Studies	In-Class-Activities,Quiz	Post-Class-Assignment, Discussion Forum
1	**UNIT-1** Basic Mathematical & Statistical Techniques		• Refer the Text book – T1 Page No: 532-574 * Handout	• Lecture on Basic Mathematical & Statistical Techniques	Review on the topic
2	LinearFunctions		• Refer the Text book -T1 • Page No: 532-574 * Handout	• PracticeLinear Functions	Review on the topic
3	Quadratic Functions		• Refer the Text book -T1 Page No: 532-574 * Handout	• PracticeQuadratic Functions	Review on the topic
4	Logarithmic Functions	Learn to apply functions, permutations, combinations and matrices in	• Refer the Text book -T1 Page No: 532-574 * Handout	• Practice Logarithmic Functions	Review on the topic

5	Exponential Functions	real life business examples	• Refer the Text book -T1 Page No: 532-574 * Handout	• Practice Exponential Functions	Review on the topic
6	Problems for practice		• Refer the Text book -T1 Page No: 532-574 * Handout	• Practice function problems	Review on the topic
7	Permutations		• Refer the Text book -T5 Page No: 346-351 * Handout	• Practice permutations	Review on the topic
8	Problems for practice		• Refer the Text book -T5 Page No: 346-351 * Handout	• Practice problems on permutations	Review on the topic
9	Combinations		• Refer the Text book -T5 Page No: 353-360 * Handout	• Practice combinations problems	Review on the topic
10	Problems for practice		• Refer the Text book -T5 Page No: 353-360 * Handout	• Practice combinations problems	Review on the topic
11	Matrices - Elementary operations of matrices		• Refer the Text book -T1 Page No: 470-500 * Handout	• Practice problems on matrices: its elementary operations	Review on the topic
12	Problems for practice		• Refer the Text book -T1 Page No: 470-500 • * Handout	• Practice matrices problems on Cramer's Rule	Review on the topic

13	Problems for practice		• Refer the Text book -T1 Page No: 470-500 • * Handout	• Practice matrices problems on Matrix Inversion Method	Review on the topic
14	**UNIT -2**Measures of Central Tendency		• Refer the Text book -T1 Page No: 100-172 * Handout	• Practice problems on Central Tendency: mean, median, mode	Review on the topic
15	Problems for practice		• Refer the Text book -T1 Page No: 100-172 * Handout	• Practice problems on Central Tendency: mean, median, mode	Review on the topic
16	Problems for practice	Analyze statistical data using measures of central tendency, dispersion and location a nd Identify the type of statistical situation to which different distribution s can be applied	• Refer the Text book -T1 Page No: 100-172 * Handout	• Practice problems on Central Tendency: mean, median, mode	Review on the topic
17	Measures of Dispersion		• Refer the Text book -T1 Page No: 173-215 * Handout	• Practice problems on standard deviation, mean deviation, range	Review on the topic
18	Problems for practice		• Refer the Text book -1 Page No: 173-215 * Handout	• Practice problems on standard deviation, mean deviation, range	Review on the topic

19	Problems for practice		• Refer the Text book -1 Page No: 173-215 * Handout	• Practice problems on standard deviation, mean deviation, range	Review on the topic
20	Simple Correlation		• Refer the Text book -1 Page No: 245-271 * Handout	• Practice problems on correlation	Review on the topic
21	Problems for practice		• Refer the Text book -1 Page No: 245-271 * Handout	• Practice problems on correlation	Review on the topic
22	Problems for practice		• Refer the Text book -1 Page No: 245-271 * Handout	• Practice problems on correlation	Review on the topic
23	Regression Analysis		• Refer the Text book -1 Page No: 245-271 * Handout	• Practice problems on regression analysis X on Y and Y on X	
24	Problems for practice		• Refer the Text book -1 Page No: 282-296 * Handout	• Practice problems on regression analysis X on Y and Y on X	

25	Problems for practice		• Refer the Text book -1 Page No: 282-296 * Handout	• Practice problems on regression analysis X on Y and Y on X	
26	Concept of Probability- Probability Rules – Joint and Marginal Probability		• Refer the Text book -1 Page No: 615-628 * Handout	• Discuss the concepts of probability to be familiar with the terms	
27	Baye's Theorem		• Refer the Text book -1 Page No: 638-643 * Handout	• Practice theorem on Baye's theorem	
28	Problems for practice		• Refer the Text book -1 Page No: 638-643 * Handout	• Practice problems relating to Baye's theorem	
29	Probability Distributions-		• Refer the Text book -3 Page No: 4.1 * Handout	• Practice problems relating to probability distributions	
30	Binomial Distributions		• Refer the Text book -3 Page No: 4.1-4.16 * Handout	• Practice problems relating to binomial distribution by using formulas	
31	Problems for practice		• Refer the Text book -3 Page No: 4.1-4.16 * Handout	• Practice problems relating to binomial distribution	

			by using formulas	
32	Poisson Distributions		• Refer the Text book -3 Page No: 4.17-4.29 * Handout	• Practice problems relating to Poisson distribution by using formulas	
33	Problems for practice		• Refer the Text book -3 Page No: 4.17-4.29 * Handout	• Practice problems relating to Poisson distribution by using formulas	
34	NormalDistributions		• Refer the Text book -3 Page No: 4.30-4.48 * Handout	• Practice problems relating to Normal distribution by using formulas	
35	Problems for practice		• Refer the Text book -3 Page No: 4.30-4.48 * Handout	• Practice problems relating to Normal distribution by using formulas	
36	Exponential ProbabilityDistribution s		• Refer the Text book -3 Page No: 4.30-4.48 * Handout	• Practice problems relating to Exponential distribution by using formulas	
37	Problems for practice		• Refer the Text book -3 Page No: 4.30-4.48	• Practice problems relating to Exponential	

			* Handout	distribution by using formulas	
38	**UNIT – 3** Introduction to Decision Theory		• Refer the Text book -4 Page No:415-418 * Handout	• Discuss the topics relating to decision theory	
39	Steps involved in Decision Making, different environments in which decisions are made		• Refer the Text book -4 Page No: 415-418 * Handout	• Discuss the steps involved in decision making in different environments	
40	Criteria for Decision Making, Decision making under uncertainty	Explore how problem solving and decision making interrelate and offering techniques for methodically evaluating decisions	• Refer the Text book -4 Page No: 415-418 * Handout	• Practice problems relating to decision making under uncertainty	Review on the topic
41	Decision making under conditions of Risk-Utility as a decision criterion		• Refer the Text book -4 Page No: 415-418 * Handout	• Practiceproblems relating to decision making under risk	Review on the topic
42	Problems for practice		• Refer the Text book -4 Page No:415-418 * Handout	• Practiceproblems relating to decision making under risk	Review on the topic
43	Problems for practice		• Refer the Text book -4 Page No: 415-418 * Handout	• Practiceproblems relating to decision making under risk	Review on the topic
44	Decision trees		• Refer the Text book -4	• Practice problems relating to	Review on the topic

				Page No: 418-423 * Handout	decision trees and steps to construct decision trees	
45	Problems for practice			• Refer the Text book -4 Page No: 418-423 * Handout	• Practiceproblems relating to decision trees and steps to construct decision trees	Review on the topic
46	Graphic displays of the decision making process			• Refer the Text book -4 Page No: 423-430 * Handout	• Practice problems relating to graphic displays in decision making process	Review on the topic
47	Problems for practice			• Refer the Text book -4 Page No: 423-430 * Handout	• Practiceproblems relating to graphic displays in decision making process	Review on the topic
48	Problems for practice			• Refer the Text book -4 Page No: 423-430 * Handout	• Practiceproblems relating to graphic displays in decision making process	Review on the topic
49-52	Student Presentations	Mid 1 Assessment		• Preparation of Mini Report by the Student on the given topic	Minimum 10 Minutes Presentation by each student	Improving presentation skills basing on faculty recommendations
53	Decision making with an active opponent			• Refer the Text book -4	• Practice problems	Review on the topic

			Page No: 430-435 * Handout	relating to decision making with an active opponent	
54	**UNIT – 4**Sampling and Sampling Distributions – Estimation – Point and Interval		• Refer the Text book -2 Page No: 428-440 * Handout	• Practice problem relating to sampling dis tributions	Review on the topic
55	Estimates of Averages and proportions of small and Large Samples	Translate real-world problems into probability models, D erive the probability density function of transformat ion of random variables Calculate probabilitie s, and derive the marginal and conditional distribution s of bivariate random variables and understand the	• Refer the Text book -2 Page No: 465-475 * Handout	• Practice problems relating to proportions and averages of small & large samples	Review on the topic
56	Proportions of small Samples		• Refer the Text book - 2 Page No: 370-378 * Handout	• Practice problems on proportion of small samples	Review on the topic
57	Problems for practice		• Refer the Text book –2 Page No: 370-378 * Handout	Practiceprobl ems on proportion of small samples	Review on the topic
58	Problems for practice		• Refer the Text book -2 Page No: 370-378 * Handout	Practiceproblems on proportion of small samples	Review on the topic
59	Proportions of Large Sample		• Refer the Text book - 2 Page No: 477-491 * Handout	• Practiceprobl ems on proportion of large samples	Review on the topic

60	Problems for practice	hypothesis testing	• Refer the Text book -2 Page No: 477-491 * Handout	• Practiceproblems on proportion of large samples	Review on the topic
61	Problems for practice		• Refer the Text book -2 Page No: 477-491 * Handout	• Practiceproblems on proportion of large samples	Review on the topic
62	**UNIT-5:**Tests of Difference between Mean of Small Samples		• Refer the Text book -2 Page No: 500-504 * Handout	• Practice problems on difference between mean of small samples	Review on the topic
63	Problems for practice	Learn parametric and nonparametric test such as the Chi-Square test for Independence as well as Goodness of Fit	• Refer the Text book -2 Page No: 500-504 * Handout	• Practiceproblems on difference between mean of small samples	Review on the topic
64	Tests of Difference between Mean of Large Samples		• Refer the Text book -2 Page No: 508-532 * Handout	• Practiceproblems on difference between mean of large samples	Review on the topic
65	Problems for practice		• Refer the Text book -2 Page No: 508-532 * Handout	• Practiceproblems on difference between mean of large samples	Review on the topic
66	Tests of Difference between Proportions of Small Samples		• Refer the Text book -2 Page No: 580-613	• Practiceproblems on difference between	Review on the topic

				* Handout	proportions of small samples	
67	Problems for practice			· Refer the Text book -2 Page No: 580-613 * Handout	· Practiceproblems on difference between proportions of small samples	Review on the topic
68	Tests of Difference between Proportions of Large Samples			· Refer the Text book -2 Page No: 533-578 * Handout	· Practiceproblems on difference between proportions of large samples	Review on the topic
69	Problems for practice			· Refer the Text book -2 Page No: 533-578 * Handout	· Practiceproblems on difference between proportions of large samples	Review on the topic
70	Chi- square Test of Independence			· Refer the Text book -2 Page No: 631-653 * Handout	· Practiceproblems on chi-square test	Review on the topic
71	Problems for practice			· Refer the Text book -2 Page No: 631-653 * Handout	· Practiceproblems on chi-square test	Review on the topic
72	Goodness of Fitness			· Refer the Text book -2 Page No: 631-653 * Handout	Practice problems on chi-square test	Review on the topic

73	Problems for practice		• Refer the Text book -2 • Refer the Text book -2 Page No: 631-653 * HandoutNo: 631-653 * Handout	Practice problems on chi-square test	Review on the topic
74	Analysis of Variance – One way		• Refer the Text book -6 Page No: 460-489 * Handout	Practice problems on chi-square test	Review on the topic
75	Analysis of Variance-one way		• Refer the Text book -6 Page No: 460-489 * Handout	Practice problems on chi-square test	Review on the topic
76	Analysis of Variance-Two way		• Refer the Text book -6 Page No: 460-489 * Handout	Practice problems on chi-square test	Review on the topic
77	Analysis of Variance-Two Way		• Refer the Text book -6 Page No: 460-489 * Handout	Practice problems on chi-square test	Review on the topic
78-80	Student Presentations	Mid 2 Assessment	• Preparation of Mini Report by the Student on the given topic		Improving presentation skills basing on faculty recommendations

Evaluation:

- Mini Report:5Marks for Mid 1 & Mid 2 Separately.

- Presentation:5Marks for Mid 1 & Mid 2 Separately.

- Descriptive Exam: 15Marks for Mid 1 & Mid 2 Separately

- Total Mid marks 30 Marks: Average of Mid 1 & Mid 2

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