| | |
|---|---|
| PROGRAM | **Master of Business Administration – Business Analytics** |
| SEMESTER | **I** |
| COURSE TITLE | **Statistics for Decision Making** |
| COURSE CODE | 04MB0112 |
| COURSE CREDITS | 03 |
| COURSE DURATION | **42 Hrs (42 sessions of 60 minutes each)** |

**COURSE OUTCOMES:**

❖ Apply various Probability Distributions in analyzing Data and solving Decision Making Problems.
❖ Apply appropriate Sampling Technique in Choosing a Representative Sample from a Population and Examine the Population Parameters using Estimation Techniques.
❖ Interpret about the Population under study by applying various Hypothesis Testing Tools and arrive at conclusions about the Business Problem in hand.
❖ Evaluate appropriate Decision Trees in finding Business Solutions under uncertainty.
❖ Develop expertise in a standard set of statistical and graphical techniques useful in analyzing business related data.

**COURSE CONTENTS:**

| Unit No | Unit / Sub Unit | Sessions |
|---|---|---|
| I | **Probability and Probability distributions:**<br>Probability Essentials, Rule of Complements, Addition Rule, Conditional Probability and the Multiplication Rule, Probabilistic Independence, Equally Likely Events, Subjective Versus Objective Probabilities, Probability Distribution of a Single Random Variable, Summary Measures of a Probability Distribution, Binomial, Poisson, Exponential and Normal Distribution.<br>**Practical using MS-Excel**: *Application of BINOMDIST, POISSON, EXPONDIST, NORMDIST, NORMINV, NORMSDIST, NORMSINV in calculation of probability in MS-Excel.* | 10 |
| II | **Sampling Distributions and Estimation:**<br>Sampling Terminology, Simple Random Sampling, Parameter, Statistic, Sampling Distribution of the Sample Mean from finite and infinite populations, The Central Limit Theorem, Sample Size Selection, Introduction to Estimation, Sources of Estimation Error, Interval estimation of mean.<br>**Practical using MS-Excel**: Sampling | 8 |
| III | **Hypothesis Testing – I:**<br>Concepts in Hypothesis Testing, Null and Alternative Hypotheses, One-Tailed Versus Two-Tailed Tests, Types of Errors, Significance Level and Rejection Region, **Concept of** p-values, **Concepts of** Type II Error and Power of Test, Z- test for Population Proportion, Z-test for Population Mean, t-test for Population Mean.<br>**Practical using MS-Excel**: t-test for single sample | 10 |
| IV | **Hypothesis Testing – II:**<br>Z-test for Differences between Population Proportions, Z-test for Differences between Population Means, t-test for Differences between Population Means, Paired t-test. | 7 |

| | Multiple Comparison: One-Way and Two-Way Analysis of Variance (ANOVA) **Practical using MS-Excel**: <br> &#10148; t-test for two means of independent samples <br> &#10148; paired t-test <br> &#10148; ANOVA Single factor, two factors without replication | |
|---|---|---|
| **V** | **Decision Making under Uncertainty:** <br>Elements of Decision Analysis, Identifying the Problem, Possible Decisions, Possible Outcomes, Probabilities of Outcomes, Payoffs and Costs, Decision Criterion, More about the EMV Criterion, Decision Trees, One-Stage Decision Problems, Multistage Decision Problems | 7 |
| **NOTE: -** | **Instructors are advised to teach numerical using MS Excel in each module.** | |

**EVALUATION:**

The students will be evaluated on a continuous basis and broadly follow the scheme given below:

| | Component | Weightage |
|---|---|---|
| A | Continuous Evaluation Component (10% using Software, 10% Assignments / Quizzes / Class Participation) | 20% (C.E.C.) |
| B | Internal Assessment | 30% (I.A.) |
| C | End-Semester Examination | 50% (External Assessment) |

**SUGGESTED READINGS:**

**Textbooks:**

| Sr. No | Author/s | Name of the Book | Publisher | Edition & Year |
|---|---|---|---|---|
| **T-01** | Anderson, Sweeney, Williams | Statistics for Business and Economics | Cengage Learning | 11$^{th}$ Edition, 2019 |
| **T-02** | Naval Bajpai | Business Statistics | Pearson | Latest Edition |

**Reference Books:**

| Sr. No | Author/s | Name of the Book | Publisher | Edition & Year |
|---|---|---|---|---|
| **R-01** | **S. Christian Albright and Wayne L. Winston** | **Business Analytics: Data Analysis and Decision making** | **Cengage Learning, USA** | **6$^{th}$ edition, 2017** |
| **R-02** | Richard I. Levin and David S. Rubin | Statistics for Management | Pearson | Latest Edition |
| **R-03** | S. Panneerselvam, and P. Nagesh Senthilkumar | Business Statistics and Analytics | Cengage Learning India | 2019 |
| **R-04** | James D. Miller | Statistics for Data Science | Packt | 2017 |
| **R-05** | P.K. Viswanathan, David Stephan, Kathryn A, Szabat David M. Levine | Business Statistics | Pearson Pvt. Ltd | 7$^{th}$ edition, 2018 |
| **R-06** | Sanjiv Jaggia, Alison Kelly | Business Statistics | McGraw Hill | Latest Edition |