**Quantitative Methods**

**Programme(s) in which it is offered: BBA**

|  |  |
| --- | --- |
| **Course Category**: Core | **Schedule of Offering**: Even |
| **Course Credit Structure: 6** | **Course Code: MAN 1215** |
| **Total Number of Hours: 120** | **Contact Hours Per Week: 8** |
| **Lecture: 4** Credits, 4 Hours | **Tutorial: 0** Credits, 0 Hours |
| **Practical: 2** Credits, 4 Hours | **Medium of Instruction: English** |
| **Date of Revision:** | **Skill Focus:** Employability |
| **Short Name of the Course: QM** | **Course Stream *(Only for Minor Courses)*:** |
| **Grading Method:** Pass/Fail | **Repeatable:** Credit |
| **Course Level:** Beginner |  |

**Course Description**

This course is a core course for BBA students. The total credit of the course is 6.

**Course Introduction**

How to use the available information to make evidence-based decision making is very important in today’s scenario. This course prepares students to learn to apply commonly used mathematical concepts and statistical methods in business contexts and how to interpret the analysis reports prepared by others.

**Course Objective**

1. To familiarize the students regarding the concepts and techniques in Business Mathematics
2. To sensitize the students regarding the application of Mathematics and Statistics in the field of business and management.
3. To make the students aware about the business statistical methods
4. To develop the student’s ability to deal with numerical and quantitative issues in business
5. To enable the use of statistical, graphical and algebraic techniques wherever relevant.
6. To have a proper understanding of Statistical applications in commerce and Management.

**Course Outcome**

By the end of the course the student will be able

1. To solve problems on progressions and calculate various index numbers.
2. To calculate and apply measures of location and measures of dispersion - grouped and ungrouped data cases
3. To compute and interpret the results of Regression and Correlation Analysis, for forecasting.
4. To solve problems based on probability.
5. Perform Test of Hypothesis as well as calculate confidence interval for a population parameter for single sample and two sample cases. Learn the application of various parametric and the non-parametric test such as the Chi-Square test.

**PO-CO Mapping**

**PO-CO Mapping Matrix**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| CO/PO Mapping | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
| CO1 |  |  |  |  |  |  |
| CO2 |  |  |  |  |  |  |
| CO3 |  |  |  |  |  |  |
| CO4 |  |  |  |  |  |  |
| CO5 |  |  |  |  |  |  |

**Prerequisites and other constraints**

Students should possess a basic knowledge of Mathematics.

**Pedagogy**

This course will be delivered through lecture, discussion-oriented method and through more practical problem solving. The practical problems and graphs related to the topic will be solved through in-class demonstrations and exposure will be provided to the students through software.

**Suggested Reading:**

1. Vohra. N.D, Business Mathematics and Statistics. McGraw Hill Education (India) Pvt Ltd.
2. Singh, J.K, Business Mathematics, Himalaya Publishing House.
3. S.P. Gupta, Statistical Methods, Sultan Chand & Sons, Educational Publishers, New Delhi.
4. Sharma, J.K, Business Statistics, Pearson Education.
5. Sharma, J.K, Business Mathematics, New Delhi, Amazon Asia-Pacific Holdings Private Limited Books Pvt Ltd.

**Evaluation Pattern**

**Evaluation Matrix**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Continuous Internal  Assessment (CIA) Components\* | Component Type | Weightage Percentage | Total  Marks | Tentative Dates | Course Outcome Mapping |
| Assignment / Presentation/ Group Project | 15 | 15 | Week 2- Week 10/ Week 11- week 13/ week 5- week 16 |  |
| Mid Term Examination | 15 | 15 | Week 7 |  |
| CIA Marks | 30 | 30 |  |  |
| ESE | | 70 | 70 |  |  |
| **Total** | | **100** | **100** |  |  |

\* The assignments involved in CIA will be subject to plagiarism checks. A submission with unexplained similarities exceeding 30% for Undergraduate courses, 20% for Postgraduate courses and 10% for PhD courses will be reverted for resubmission. The final submission is subject to score penalization as defined by the course instructor at the start of the course, with a clear communication of the same to all the registered candidates.

Note:

1. Course Outcome mapping of this matrix should match with the PO-CO Matrix.
2. The component type is based on the course and the instructor.
3. The Weightage Percentage for the internal components should be calculated based on the total CIA marks.

**Module Sessions**

**Module I: Progressions (15 Hours)**

Arithmetic Progression (A.P) and Geometric Progression (G.P), Permutation and combination, Index number- Meaning and uses of index numbers- construction of index numbers, Aggregative index numbers, Average of Relatives Index Numbers, Simple & weighted; Value Index, Consumer Price Index Number.

**Readings:**

**1.Vohra. N.D, Business Mathematics and Statistics. McGraw Hill Education (India) Pvt Ltd.**

**2. Singh, J.K, Business Mathematics, Himalaya Publishing House**

**3. Sharma, J.K, Business Mathematics, New Delhi, Amazon Asia-Pacific Holdings Private Limited Books Pvt Ltd.**

**Activity:**

* + - 1. **Assignments**

**Module II: Statistics (20 Hours)**

Relevance, Introduction and definition-Phases of statistical study-Scope and limitations-Application of statistics in various areas-Types, sources and collection of data- Presentation of data- charts and graphs- frequency distribution. Measures of Central Tendency: Mean, Median and Mode- Measures of Dispersion: Range, Quartile deviation, Mean deviation, Standard Deviation-Variance and Coefficient of variation - Skewness and Kurtosis.

**Readings:**

**1.Vohra. N.D, Business Mathematics and Statistics. McGraw Hill Education (India) Pvt Ltd.**

**2. S.P. Gupta, Statistical Methods, Sultan Chand & Sons, Educational Publishers, New Delhi.**

**3. Sharma, J.K, Business Statistics, Pearson Education.**

**Activity:**

**Assignment**

**Group Project**

**Presentation**

**Module III: Correlation & Regression Analysis ( 15 Hours)**

Correlation, Types of Correlation- Scatter diagram- Karl Pearson’s Co-efficient of Correlation-Spearman’s Rank Correlation Co-efficient- Correlation and causation- Probable error. Regression Analysis - Lines of Regression, Regression Equations and regression co- efficient, Relationship between correlation and regression coefficients, Standard error of estimate-Application of correlation and regression in business data analysis.

**Readings:**

**1.Vohra. N.D, Business Mathematics and Statistics. McGraw Hill Education (India) Pvt Ltd.**

**2. S.P. Gupta, Statistical Methods, Sultan Chand & Sons, Educational Publishers, New Delhi.**

**3. Sharma, J.K, Business Statistics, Pearson Education.**

**Activity:**

**Assignment**

**Group Project**

**Presentation**

**Module IV: Probability & Theoretical distribution ( 15 Hours)**

Concept of probability –meaning and definition-approaches to probability-Theorems of probability-addition theorem-multiplication theorem (Statement only)- conditional probability-inverse probability-Baye’s theorem. Binomial distribution-basic assumptions and characteristics-fitting of binomial distribution-Poisson distribution –characteristics-fitting of Poisson Distribution-Normal distribution-features and properties-standard normal curve.

**Readings:**

**1.Vohra. N.D, Business Mathematics and Statistics. McGraw Hill Education (India) Pvt Ltd.**

**2. S.P. Gupta, Statistical Methods, Sultan Chand & Sons, Educational Publishers, New Delhi.**

**3. Sharma, J.K, Business Statistics, Pearson Education.**

**Activity:**

**Assignment**

**Presentation**

**Module V: Testing of Hypothesis (25 hours)**

Population and Sample. Sampling Methods-Testing of hypothesis-Procedure-error in testing-two tail tests and one tail tests-Confidence level- nonparametric tests (Chi-square test only). Parametric tests -Z test- test of significance of large samples-test for two sample means- small sample mean tests-Students t test-Analysis of variance-F-test-one-way ANOVA and two-way ANOVA tests.

**Readings:**

**1.Vohra. N.D, Business Mathematics and Statistics. McGraw Hill Education (India) Pvt Ltd.**

**2. S.P. Gupta, Statistical Methods, Sultan Chand & Sons, Educational Publishers, New Delhi.**

**3. Sharma, J.K, Business Statistics, Pearson Education.**

**Activity:**

**Assignment**

**Group Project**

**Presentation**