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| Subject Code | Subject Name | Credits |
| MCA105 | Statistics And Probability | 04 |

| Subject Code | Subject Name | Teaching Scheme | | | Credits Assigned | | | |
|---------------|-----------------------------------|-----------------|-------|-----|------------------|----|------|-----------|
| | | Theory | Pract | Tut | Theory | TW | Tut. | Total |
| MCA105 | Statistics And Probability | 04 | -- | -- | 04 | -- | -- | 04 |

| Subject Code | Subject Name | Examination Scheme | | | | | | | |
|---------------|-----------------------------------|---------------------|------------|--------------------|-------------------|----|-------|------|-------|
| MCA105 | Statistics And Probability | Theory Marks | | | | TW | Pract | Oral | Total |
| | | Internal Assessment | | | End Semester Exam | | | | |
| | | Test1 (T1) | Test2 (T2) | Average of T1 & T2 | | | | | |
| | | 20 | 20 | 20 | 80 | - | - | - | 100 |

Pre-requisites:

Basic Mathematics, combinatorics and calculus Knowledge.

Course Educational Objectives (CEO):

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| CEO 1 | To equip the students with a working knowledge of probability, statistics, and modeling in the presence of uncertainties. |
| CEO 2 | To understand the concept of hypothesis and significance tests |
| CEO 3 | To help the students to develop an intuition and an interest for random phenomena and to introduce both theoretical issues and applications that may be useful in real life. |

Course Outcomes: At the end of the course, the students will be able to:

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| MCA105.1 | Distinguish between quantitative and categorical data |
| MCA105.2 | Apply different statistical measures on data |
| MCA105.3 | Identify, formulate and solve problems |
| MCA105.4 | Classify different types of Probability and their fundamental applications |

Syllabus

| Sr. No | Module | Detailed Contents | Hours |
|--------|--|---|-------|
| 1 | Measures of Central Tendency & Measures of Dispersion | Frequency Distribution, Histogram, Stem and leaf diagram, ogives, Frequency Polygon, Mean, Median, Mode, Range, Quartile Deviation, Mean Deviation, Box whisker plot, Standard Deviation, Coefficient of Variation | 8 |
| 2 | Skewness, Correlation & Regression | Karl Pearson's coefficient of Skewness, Bowley's coefficient of Skewness, Scatter Diagram, Karl Pearson's coefficient of correlation, Spearman's rank correlation coefficient, Linear Regression and Estimation, Coefficients of regression | 8 |
| 3 | Theory of Attributes | Classes and Class Frequencies, Consistency of Data, Independence of Attributes, Association of Attributes | 4 |
| 4 | Testing of Hypothesis | Hypothesis, Type I and Type II errors. Tests of significance – Student's t-test: Single Mean, Difference of means, paired t-test, Chi-Square test: Test of Goodness of Fit, Independence Test | 10 |
| 5 | Introduction to Probability | Random experiment, Sample space, Events, Axiomatic Probability, Algebra of events | 4 |
| 6 | Conditional Probability | Conditional Probability, Multiplication theorem of Probability, Independent events, Baye's Theorem | 6 |
| 7 | Random variables | Discrete random variable, Continuous random variable, Two-dimensional random variable, Joint probability distribution, Stochastic independence | 7 |
| 8 | Mathematical Expectation | Expected value of a random variable, Expected value of a function of a random variable, Properties of Expectation and Variance, Covariance | 5 |

Reference Books:

1. Fundamentals of Mathematical Statistics – 1st Edition S.C.Gupta, V.K.Kapoor, S Chand
2. Introduction to Probability & Statistics – 4th Edition J.Susan Milton, Jesse C. Arnold Tata McGraw Hill
3. Fundamentals of Statistics : 7th edition S C Gupta, Himalaya Publishing house
4. Probability and Statistics with Reliability, Queuing, And Computer Science Applications (English) 1st Edition: Kishore Trivedi, PHI
5. Schaum's Outlines Probability, Random Variables & Random Process 3rd Edition Tata McGraw Hill
6. Probability & Statistics for Engineers: Dr J Ravichandran, Wiley
7. Statistics for Business and Economics: Dr Seema Sharma, Wiley
8. Applied Business Statistics 7th Edition Ken Black, Wiley

Assessment:

University of Mumbai, MCA Sem I and Sem II Rev. 2016-17

Internal:

Assessment consists of two tests (T1 and T2) .The final marks should be the average of the two tests.

End Semester Theory Examination: Guidelines for setting up the question paper.

1. Question paper will comprise of total six questions.
2. Question Number One should be compulsory.
3. All question carry equal marks.
4. Students can attempt any three from the remaining.
5. Questions will be mixed in nature (for example supposed Q.2 has part (a) from module 3 then part (b) will be from any module other than module 3).

In question paper weightage of each module will be proportional to number of respective lecture hours as mention in the syllabus.