**Subject: BUSINESS STATISTICS**
**Title: BUSINESS STATISTICS**
**[CORE COURSE]**

| Semester: II | Credits: 3 | Subject Code: BB22005 | Lectures: 48 |
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## Course Outcomes:

At the end of the course, the learner will be able to ,

- Identify, assess and execute oneself effectively in a broad range of analytic, scientific, government, financial, health, technical and other positions.
- Determine, relate and evaluatethe connections between theory and applications.
- Analyze, apply, experiment and evaluatestatistical reasoning, formulate a problem in statistical terms, perform exploratory analysis of data by graphical and other means, and carry out a variety of formal inference procedures.
- Describe, examine and apply the concept of average and estimation which would help them in business forecasting.
- Identify, predict, validate and explain decision making using statistical models.
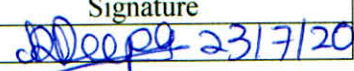
| Unit 1: Population and Sample | 08 |
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- Definition of Statistics, Scope of Statistics in various other subjects. Concept of raw data, attributes, variables, population, sample, statistical error (residual), real life applications.
- Methods of Sampling- Probabilistic and Non-Probabilistic.
- Data condensation, classification, frequency distribution and cumulative frequency distribution
- Graphs- Histogram, Frequency Polygon, Ogives (Less Than and More Than type). Determination of Median and Mode graphically.
  Diagrams- Line graph, Bars, Multiple Bars, Subdivided Bars, Component Bar Charts, Horizontal Bars, Pie Chart.
- Numerical Problems

| Unit 2: Measures of Central Tendency and Dispersion | 12 |
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- Concept of Central Tendency. Criteria for Good Measures of Central Tendency. Arithmetic Mean- Concept, Simple and Weighted Mean for Grouped and Ungrouped Data, Important Properties of Arithmetic Mean, Missing Frequency, Mean of Composite Group, Merits and Demerits.
- Median – Concept, Calculation from Simple Series, Simple Frequency Distribution, Grouped Frequency Distribution and by Graphical Method, Missing Frequency, Advantages and Disadvantages.
- Mode – Concept, Calculation from a Simple Series, Simple Frequency Distribution, Grouped Frequency Distribution and by Graphical Methods. Advantages and Disadvantages.

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- Concept of Dispersion – Meaning and Necessity of Measures of Dispersion, Absolute and Relative Measure of Dispersion. Range – Concept, Coefficient of Range, Merits and Demerits, Uses.
- Standard Deviation – Concept of Standard Deviation and Variance, Important Properties, Calculation from Simple Series, Simple Frequency Distribution and Grouped Frequency Distribution, Standard Deviation of Combined Group.
- Coefficient of Variation, Quartile Deviation, Coefficient of Quartile Deviation.
- Numerical Problems.

| Unit 3: Correlation and Regression (for Ungrouped Data) | 10 |
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- Concept of Correlation, Bivariate Data, Scatter Diagram, Positive and Negative correlation. Difference between Correlation and Regression.
- Covariance, Karl Pearson's Coefficient of Correlation, Properties of Correlation Coefficient, Interpretation and Use of Correlation Coefficient.
- Meaning of Regression, Two Regression Equations, Regression Coefficients, Properties of Linear Regression.
- Rank Correlation, Spearman's Formula for Rank Correlation Coefficient, Uses.
- Numerical Problems.

| Unit 4: Time Series | 12 |
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- Definitions and utility of Time Series Analysis, Components of Time Series, Trend, Seasonal Variation and cyclic variation, irregular or erratic variations.
- Measurement of Trend: Freehand or graphical method, Semi Average, Moving average Method, Method of Least Squares.
- Measurement of Seasonal Variations: Method of Seasonal Averages, Ratio-to-trend Method, Moving Average Method
- Numerical Problems

| Unit 5: Index Numbers | 06 |
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- Definition of Index Number. Characteristics and Uses of Index Numbers.
- Methods of Construction of Index Numbers – Aggregative Method and Relative Method, Types of Index Numbers- Price Index, Quantity Index and Value Index – Laspeyres' Index, Paasche's Index, Edgeworth-Marshall's Index, Fisher's Ideal Index, Bowley's Index, Walsh's Index, Kelly's Index.
- Cost of Living Index Numbers. Problems in the construction of Index Numbers.
- Numerical Problems.

**#12 hours for Library work, assignments, practical or field work**

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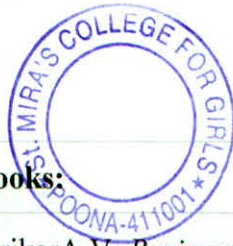
## Recommended Text Books:

- Dixit P. G.,RayarikarA.V.,*Business Statistics*, Nirali Prakashan, Pune, 2013
- Dixit P. G., *Business Statistics*, Nirali Prakashan, Pune, 2019
- SahaSuranjan, *Basic Business Mathematics and Statistics*, New Central, Calcutta, 1994
- Agarwal B L, *Basic Statistics*, Wiley Publication, 1988

## Reference Books:

- GuptaS.P.,*Statistical Methods*, Sultan Chand,2005
- LevinRichard I and RubinDavid S,*Statistics for Management*, Prentice Hall of India,1997
- Gupta S.P, and Gupta Business M. P., *Statistics*, Sultan Chand,2008
- ChitaleRanjeet,*Statistical and Quantitative Methods*, Nirali Prakashan,2009
- Saha S and Mukherji S., *Quantitative Methods (Mathematical, statistical & Economic Techniques),* Central's ICWA,
- Black Ken, *Applied Business Statistics: Making Better Business Decisions*, Wiley India, New Delhi, 2012
- Beri G C, *Business Statistics*, Tata McGrawHill, New Delhi, 2010
- BakshiSandeep Kumar, *Business Statistics*, A. K. Publication, 2010

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| Chairman (HoD) | Ms. DeepaKrishnamurthi | *Deepa* 23/7/20 | *Deepa* 23/7/20 |
| VC Nominee (SPPU) | Dr. Anil Khairnar | *Bhaiamas* 23/07/2020 | *Bhaiamas* 23/07/2020 |
| Subject Expert (Outside SPPU) | Dr. Prashant P Malvadkar | *Prnt* 23/8/20 | *Prnt* 23/7/20 |
| Subject Expert (Outside SPPU) | Dr. Avinash A Patil | *Aatis* 23/8/20 | *Aatis* 23/7/20 |
| Industry Expert | Mr. Prakash Bade | *PB* 23/7/20 | *PB* 23/7/20 |
| Subject Expert (Internal) | Mrs. RituBhargav | *Ritu Bhargav* 23/8/20 | *Ritu Bhargav* 23/8/20 |
| Subject Expert (Internal) | Mrs. Amrita Basu | *ABasu* 23/7/20 | *ABasu* 23/8/20 |
| Alumni | Ms. SrushtiMoundekar | | |

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