Tolani College of Commerce (Autonomous)
तोलानी वाणिज्य महाविद्यालय ( स्वायत्त )
Knowledge is Supreme
(Sponsored and Managed by Tolani Education Society, Mumbai - 400 021)
(Recognised Linguistic (Sindhi) Minority Institution, Affiliated to University of Mumbai)
Re-Accredited (3rd Cycle) by N.A.A.C. with 'A' Grade (CGPA 3.03)
150-151, SHER-E-PUNJAB SOCIETY,
GURU GOBIND SINGH ROAD,
ANDHERI (EAST), MUMBAI-400 093.
Tel. : (022) 6153 5455
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# Title of the Course : Business mathematics

## Programme: Bachelor of Commerce - Semester - II

## Syllabus for Four credits Course - From the academic year- 2024-2025

| Sr. No. | Heading | Particulars |
|---|---|---|
| 1 | **Description of the course:** | Business mathematics is a branch of mathematics that applies mathematical techniques to solve business problems and make informed business decisions. Its primary focus is on the practical application of mathematical concepts in various business and financial contexts.<br><br>Business mathematics helps the individuals to develop their mathematical skills and knowledge necessary to solve practical problems, make sound financial decisions, and contribute to the success and efficiency of businesses across various industries. |
| 2 | **Vertical :** | Open Elective |
| 3 | **Type :** | Theory / Practical |
| 4 | **Credit**: | 4 credits ( 2 credit = 30 Hours for Theory and 30 Hours of Practical work in a semester ) |
| 5 | **Hours Allotted :** | 60 Hours |
| 6 | **Marks Allotted**: | 100 Marks (60 (SE) + 40 (CE)) |

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| **7** | **Course Objectives**:<br>1. To enable the students to understand the basic concepts of derivatives and the related functions including their definitions, characteristics<br>2. To enable the students to understand the Concepts and Components of Time Series,<br>Index Numbers and its Types<br>3. To enable the students to understand the concept of Simple interest and compound interest<br>4. To enable the students to understand the basic definitions used in correlation and regression |
| **8** | **Course Outcomes**:<br>1. Students gained a deep understanding about the different rules of derivatives and also were able to apply their knowledge to solve problems based on it.<br>2. Students will be able to apply their knowledge to solve the problems based on Time series and Index numbers<br>3. Students will be able to apply their knowledge to solve the problem based on<br>Interests and annuities<br>4. Students gain a deep understanding of fundamentals of correlation and regression |
| **9** | **Modules**:- |
| | **Module 1:Functions, Derivatives and their applications**<br>● Concept of real functions: Constant function, Linear function, $x^n$ , $e^x$ , $a^x$ , log x<br>● Demand, Supply, Total Revenue, Average revenue, Total Cost, Average Cost and Profit function. Equilibrium Point, Break-even |

point.Derivatives of functions:Derivative as rate measure, Derivative of $x^n$ , $e^x$ , $a^x$ , log x

- Rules of Derivatives, Scalar multiplication, sum, difference, product, quotient (statements only) , Simple problems , Second order derivatives.
- Applications: Marginal Cost, Marginal Revenue, Elasticity of demand, Maxima and minima for functions in Economics and Commerce.

**Module 2: Interest and Annuity**

- **Interest**: Simple interest, Compound Interest (Nominal & Effective rate of interest) Calculations involving up to 4 time periods.
- **Annuity**: Annuity immediate and its present value, Future value
- Equated Monthly Instalments (EMI) using reducing balance method & amortization of loans. Stated annual rates and Effective annual rate,
- Perpetuity and its present value. Simple problems involving up to 4 time periods.

**Module 3: Bivariate Linear Correlation and Regression**

- **Correlation Analysis**: Meaning, types of correlation, determination of correlation, scatter diagram, Karl Pearson's method of correlation coefficient (excluding Bivariate Frequency Distribution Table)
- Spearman's Rank Correlation Coefficient , Correlation for repeated ranks
- **Regression Analysis**: Meaning, Concept of Regression Equations, Slope of Regression Line and its interpretation of Regression Coefficients (excluding Bivariate Frequency Distribution Table) Relationship Between Coefficient of Correlation and Regression Coefficients,
- Finding the Equations of Regression Lines by Method of Least Squares.

**Module 4: Time Series and Index Number (15 Hours)**

- Concepts and Components of Time Series Representation of Trend by Freehand Curve Method, Estimation of Trend using Moving Average Method and Least Square Method (Linear Trend only)
- Concepts and Components of Time Series Representation of Trend by Freehand Curve Method, Estimation of Trend using Moving Average Method and Least Square Method (Linear Trend only)
- Concept and usage of Index Numbers, Types of Index Numbers, Aggregate And Relative Index Numbers, Laspeyer's, Paasche's , Dorbish and Bowley's ,Marshall and Edgeworth's and Fisher's Ideal Index Numbers, Cost of Living Index Numbers, Concept of Real Income

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|---|---|---|
| **10** | **Reference Books**<br>**1.** B Aggarwal, Business Mathematics & Statistics: B Aggarwal, Ane Book Pvt. Limited, 2016<br>**2.** J. D. Gupta, P. K. Gupta and Man Mohan, Mathematics for Business Economics, 1987<br>3. By S. Saha and S. Mukerji, Quantitative Methods, New Central Book, 5th Revised Edition, 2002 | |
| **11** | **Internal Continuous Assessment: 40%** | **Semester End Examination : 60%** |
| **12** | **Continuous Evaluation through:** | **Assignments and Practical** |
| **13** | **Format of Question Paper:**<br>Q. 1 Attempt any Three (15 marks)<br>a.<br>b.<br>c.<br>d.<br>Q. 2 Attempt any Three (15 marks)<br>a.<br>b.<br>c.<br>d.<br>Q. 3 Attempt any Three (15 marks)<br>a.<br>b.<br>c.<br>d. | |

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| | Q. 4 Attempt any Three (15 marks)<br>a.<br>b.<br>c.<br>d. |