

As Per NEP 2020

University of Mumbai



Syllabus for Basket of OE	
Board of Studies in Mathematics	
UG First Year Programme	
Semester	II
Title of Paper	Credits 2/ 4
I) Financial Mathematics II	2
From the Academic Year	2024-25

Name of the Course: Financial Mathematics - II

Sr. No.	Heading	Particulars
1	Description the course: Including but not limited to:	This course offers a comprehensive exploration of finance and statistical analysis. It covers essential topics such as shares, mutual funds, time series analysis, and index numbers. Students learn about shares and mutual funds, including concepts like face value, market value, and dividends, and how to calculate net income considering various factors. Additionally, they delve into time series analysis, where they explore trend estimation methods like Moving Average and Least Squares, and forecasting techniques using the Least Squares Method. The significance of index numbers in economic analysis is also emphasized, providing students with practical skills and knowledge applicable to real-world scenarios in finance and statistics.
2	Vertical:	OE
3	Type:	Theory
4	Credits:	2 credits (1 credit = 15 Hours for Theory or 30 Hours of Practical work in a semester)
5	Hours Allotted:	30 Hours
6	Marks Allotted:	50 Marks
7	Course Objectives (CO): (List the course objectives) This course takes a comprehensive look at important ideas in finance and statistical analysis. Students learn about the complexities of financial instruments like stocks and mutual funds, as well as the principles of time series analysis and index numbers, throughout this course. CO1: To offer a thorough understanding of shares and mutual funds, including their types, components and calculations. CO2: To learn the concepts of time series and index numbers, including trend estimation methods and forecasting techniques. CO3: To develop proficiency in calculating various index numbers and understanding their significance in economic analysis. CO4: To acquire skills in averaging prices through Systematic Investment Plan (SIP) and interpreting its implications in mutual fund investments.	
8	Course Outcomes (OC):	

	After completion of the course, students will be able to. OC1: demonstrate a comprehensive understanding of financial instruments such as shares and mutual funds, enabling them to make informed investment decisions. OC2: calculate various index numbers, enabling them to measure price changes and cost of living accurately. OC3: apply statistical tools such as averaging prices through SIP in mutual fund investments, enhancing their practical understanding of financial markets. OC4: analyze time series data and estimating trends using appropriate statistical methods. OC5: develop the ability to forecast future trends using the Least Squares Method, enhancing their predictive capabilities.
9	Modules:- Module 1: Shares and Mutual Funds: • Concepts of shares, face value, market value, dividend, equity shares preferential shares, bonus shares, Simple examples. • Mutual Funds, Simple problems on calculation of Net Income after considering entry load, dividend, change in Net Asset Value (N.A.V) and exit load. • Averaging of price under the ‘Systematic Investment Plan (S.I.P)’. Module 2: Time Series and Index Numbers • Concept and Components of time series. Estimation of Trend using Moving Average Method & Least Squares Method (only Linear Trend). • Concept of Forecasting using Least Squares Method. • Concept and uses of Index Numbers. Simple and Composite Index Nos. (unweighted, weighted). • Laspeyre’s Price Index No., Paasche’s Price Index No. Fisher’s Price Index No., Dorbish-Bowley’s Index Number, Marshall and Edgeworth Index Number. • Cost of Living Index No., Real Income
10	Text Books 1. Fundamentals of Mathematical Statistics, 12th Edition, S. C. Gupta and V. K. Kapoor, Sultan Chand & Sons, 2020. 2. Statistics for Business and Economics, 11th Edition, David R. Anderson, Dennis J. Sweeney and Thomas A. Williams, Cengage Learning, 2011. 3. Introductory Statistics, 8th Edition, Prem S. Mann, John Wiley & Sons Inc., 2013.
11	Reference Books 1. A First Course in Statistics, 12th Edition, James McClave and Terry Sincich, Pearson Education Limited, 2018. 2. Introductory Statistics, Barbara Illowsky, Susan Dean and Laurel Chiappetta, OpenStax, 2013.
	<u>Scheme of the Examination</u>
	The performance of the learners shall be evaluated into two parts. • Internal Continuous Assessment of 20 marks for each paper. • Semester End Examination of 30 marks for each paper. • Separate head of passing is required for internal and semester end examination.

12	Internal Continuous Assessment: 40% Semester End Examination: 60%			
13	Continuous Evaluation through: Quizzes, Class Tests, presentations, projects, role play, creative writing, assignments etc. (at least 3)			
	Sr. No.	Particulars		Marks
	1	A class test of 10 marks is to be conducted during each semester in an Offline mode.		10
	2	Project on any one topic related to the syllabus or a quiz (offline/online) on one of the modules.		05
	3	Seminar/ group presentation on any one topic related to the syllabus.		05
Paper pattern of the Test (Offline Mode with One hour duration): Q1: Definitions/Fill in the blanks/ True or False with Justification. (04 Marks: 4 x 1). Q2: Attempt any 2 from 3 descriptive questions. (06 marks: 2 × 3)				
14	Format of Question Paper: The semester-end examination will be of 30 marks of one hour duration covering the entire syllabus of the semester.			
Note: Attempt any TWO questions out of THREE.				
Q.No.1	Module 1 and 2	Attempt any THREE out of FOUR . (Each question of 5 marks) (a) Question based on OC1/OC2 (b) Question based on OC3 (c) Question based on OC4 (d) Question based on OC5	15 Marks	
Q.No.2	Module 1 and 2	Attempt any THREE out of FOUR . (Each question of 5 marks) (a) Question based on OC1/OC2 (b) Question based on OC3 (c) Question based on OC4 (d) Question based on OC5	15 Marks	

	Q.No.3	Module 1 and 2	Attempt any THREE out of FOUR . (Each question of 5 marks) (a) Question based on OC1/OC2 (b) Question based on OC3 (c) Question based on OC4 (d) Question based on OC5	15 Marks
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**Sign of the BOS
Chairman**

**Dr. Bhausahab S Desale
The Chairman, Board of
Studies in Mathematics**

**Sign of the
Offg. Associate Dean
Dr. Madhav R. Rajwade
Faculty of Science &
Technology**

**Sign of the
Offg. Dean
Prof. Shivram S. Garje
Faculty of Science &
Technology**