

As Per NEP 2020

University of Mumbai



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

Name of the Course: Financial Mathematics - I

Sr. No.	Heading	Particulars
1	Description the course: Including but not limited to:	This course offers a comprehensive exploration of key concepts in finance, statistics, and mathematical modeling. Through this course students delve into topics such as interest, annuities, measures of central tendency, and dispersion. It focuses on financial mathematics, covering simple and compound interest, Equated Monthly Installments (EMI), and annuity calculations. It also offers statistical analysis, learning about various measures of central tendency and dispersion. The course aims to equip students with practical analytical skills and mathematical tools 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): This course provides a thorough examination of finance and statistics fundamentals. Covering interest, annuities, and statistical measures like central tendency and dispersion, it equips students with practical skills for real-world applications in finance and data analysis. By the end, students gain a strong understanding of these concepts for effective decision-making. CO1: To understand the concepts of simple interest, compound interest and Equated Monthly Instalments (EMI) enabling complex financial analysis. CO2: To introduce students to various measures of central tendency such as arithmetic mean, weighted mean, mode, combined mean, and its relevance in statistical analysis. CO3: To calculate measures of dispersion including median, quartiles, deciles, and percentiles, providing insight into data spread. CO4: To use standard deviation and its relative measures, facilitating a deeper understanding of data variability.	
8	Course Outcomes (OC):	

	After completion of the course, students will be able to. OC1: apply simple interest, compound interest, EMIs formulas for various scenarios, including multiple compounding periods for effective loan management. OC2: compute present and future values of annuities, aiding in long-term financial planning. OC3: calculate and interpret different measures of central tendency, providing insight into data distribution. OC4: understand the importance of mode as a measure of central tendency and its application in real-world scenarios. OC5: develop a solid understanding of standard deviation and its relative measures, facilitating advanced statistical analysis and interpretation.
9	Modules: - Module 1: Interest and Annuity • Simple Interest and Compound Interest, Compounded more than once a year. • Calculations involving up to 4 time periods. • Annuity, Immediate and due, Present value, Future value of an Annuity • Equated Monthly Instalments (EMI) using reducing & flat interest system. Module 2: Measures of Central Tendency and Dispersion • Arithmetic mean, Weighted mean, Combined mean • Median, Quartiles, Deciles, Percentiles • Mode • Range, Quartile deviation, Mean deviation from mean, median, mode • Standard deviation and their relative measures.
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) <table><tr><td>Sr. No.</td><td>Particulars</td><td>Marks</td></tr><tr><td>1</td><td>A class test of 10 marks is to be conducted during each semester in an Offline mode.</td><td>10</td></tr><tr><td>2</td><td>Project on any one topic related to the syllabus or a quiz (offline/online) on one of the modules.</td><td>05</td></tr><tr><td>3</td><td>Seminar/ group presentation on any one topic related to the syllabus.</td><td>05</td></tr></table> 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)	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	
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3	Seminar/ group presentation on any one topic related to the syllabus.	05												
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. <table><tr><td colspan="4">Note: Attempt any TWO questions out of THREE.</td></tr><tr><td>Q.No.1</td><td>Module 1 and 2</td><td>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</td><td>15 Marks</td></tr><tr><td>Q.No.2</td><td>Module 1 and 2</td><td>Attempt any THREE out of FOUR. (Each question of 5 marks) (a) Question based on OC1/OC2 (b) Question based on OC3</td><td>15 Marks</td></tr></table>	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	15 Marks	
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**Sign of the BOS
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Dr. Bhausahab S Desale
The Chairman, Board of
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Technology**