

As Per NEP 2020

University of Mumbai



Syllabus for Basket of VSC for Commerce Faculty	
Board of Studies in Mathematics	
UG First Year Programme	
Semester	II
Title of Paper	Credits
I) Commercial Mathematics II (VSC)	2
From the Academic Year	2024-25

Name of the Course: Commercial Mathematics – II

Sr. No.	Heading	Particulars
1	Description the course: Including but not limited to:	The course aims to provide students with a solid foundation in financial mathematics, economics, and mathematical modeling, enabling them to understand and analyze various real-world economic phenomena. It includes developing analytical and problem-solving skills, understanding the mathematical tools used in finance and economics, and applying them to practical scenarios. It develops ability to calculate interest and annuities, analyze market dynamics using demand and supply functions, interpret cost and profit functions, and formulate and solve linear programming problems.
2	Vertical:	VSC
3	Type:	Practical
4	Credits:	2 credits (1 credit = 15 Hours for Theory or 30 Hours of Practical work in a semester)
5	Hours Allotted:	60 Hours
6	Marks Allotted:	50 Marks
7	Course Objectives (CO): This course aims to equip students with a strong foundation in financial mathematics, economics, and mathematical modelling. It includes developing analytical skills, understanding mathematical tools, and applying them practically. It also encompasses calculating interest and annuities, analysing market dynamics, interpreting cost and profit functions, and solving linear programming problems. Overall, the syllabus provides essential knowledge relevant to finance, economics, and mathematical modelling. CO1: To understand the principles of simple and compound interest and their applications in financial calculations. CO2: To introduce students to fundamental real functions and their role in economic modelling. CO3: To explore key economic concepts such as demand, supply, total revenue, and average revenue, and understand their mathematical representations. CO4: To develop graphing skills for linear equations, linear inequalities, and other relevant economic functions. CO5: To equip students with the tools to formulate and solve linear programming	

	problems with up to two variables.
8	Course Outcomes (OC) After completion of the course, students will be able to OC1: calculate simple, compound interest for various scenarios and to compute EMIs using both reducing balance and flat interest systems. OC2: determine the present and future values of annuities and apply this knowledge to financial decision-making. OC3: understand the relationships between demand, supply, and market equilibrium, and interpret them using mathematical models. OC4: develop graphing skills to visually represent economic relationships and analyze their implications. OC5: formulate linear programming problems and apply appropriate techniques to find optimal solutions, facilitating efficient resource allocation and decision-making.
9	Modules: - Module 1: Interest and Annuity - Simple Interest and Compound Interest, Compounded more than once a year. - Practical based on simple interest (finding Interest and Final Amount) - Practical based on Simple interest (finding rate of interest) - Practical based on Simple interest (finding period) - Practical based on Compound interest (finding Interest and Final Amount) - Practical based on Compound interest (finding rate of interest) - Practical based on Compound interest (finding period) - Practical based on Compound interest where compounding is more than once in a year - Annuity, Immediate and due, Present value, Future value of an Annuity - Practical on Annuity Immediate and Annuity Due - Practical on finding Present value and Future value of an Annuity - Equated Monthly Instalments (EMI) using reducing balance & flat interest system. - Practical on EMI using reducing balance method - Practical on EMI using flat interest method. Students are encouraged to use excel to solve practical problems. Module 2: Functions in Economics and LPP - Concept of real functions: constant function, linear function, quadratic function - Practical based on constant function, linear function and quadratic function (students will be expected to identify and differentiate between these types of functions) - Practical based on graphs of constant, linear and quadratic functions - Concept of Demand, Supply, Total Revenue, Average Revenue - Practical on demand function and supply function - Practical based on Average Revenue and Total Revenue - Concept of Total Cost, Average Cost and Profit function. Equilibrium Point - Practical on Total Cost and Average cost - Practical on Profit function - Practical on Equilibrium point - Sketching of graphs of (i) linear equation $Ax + By + C = 0$ (ii) linear inequalities. - Practical on drawing graphs on linear inequalities (where constant term $C \neq 0$)

	• Practical on drawing graphs on linear inequalities (where constant term $C = 0$) 5. Mathematical Formulation of Linear Programming Problems up to 2 variables. • Practical on formulation of LPP from the given information • Practical on maximization of a function under the given constraints • Practical on minimization of a function under the given constraints Students are encouraged to use GeoGebra/Tora for solving LPP practical problems.										
10	Text Books 1. Business Mathematics, M. Wilson, Himalaya Publishing House. 2. A textbook of Business Mathematics, R. Jayaprakash Reddy, Y. Mallikarjuna Reddy,										
11	Reference Books 1. Business Mathematics and Statistics, S.K. Khandelwal, International Book House Pvt. Ltd. 2. Business Mathematics, K.L. Sehgal, Himalaya Publishing House.										
	<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, presentation, project, role play, creative writing, assignment etc. (at least 3) Mid semester practical examination of 20 marks will be conducted on covered syllabus (at least 50% of total syllabus) of one hour duration as per the following pattern. <table border="1"> <thead> <tr> <th>Sr. No.</th><th>Title</th><th>Marks</th></tr> </thead> <tbody> <tr> <td>1.</td><td>Quiz comprising of MCQs (Attempt any 5 out of 8) (Online/Offline)</td><td>05</td></tr> <tr> <td>2.</td><td>Class Test comprising of Problems/ Programs (Attempt any 2 out of 4)</td><td>10</td></tr> </tbody> </table>	Sr. No.	Title	Marks	1.	Quiz comprising of MCQs (Attempt any 5 out of 8) (Online/Offline)	05	2.	Class Test comprising of Problems/ Programs (Attempt any 2 out of 4)	10	
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2.	Class Test comprising of Problems/ Programs (Attempt any 2 out of 4)	10									

	3.	Viva	05										
14	Format of Question Paper: The performance of the learners shall be evaluated into two parts. • Internal Continuous Assessment of 20 marks. • Semester End Examination of 30 marks. • Separate head of passing is required for internal, and semester end practical examination. Semester End Practical Examination (30 marks): Semester end practical examination of 30 marks on entire syllabus will be conducted of three hours duration as per the following pattern. <table><tr><th>Sr. No.</th><th>Title</th><th>Marks</th></tr><tr><td>1.</td><td>Problems/ Programs (Attempt any 5 out of 8)</td><td>25 Marks</td></tr><tr><td>2.</td><td>Journal</td><td>05 Marks</td></tr></table> The students are required to perform 75% of the Practical for the journal to be duly certified. The students are required to present a duly certified journal for appearing at the practical examination, failing which they will not be allowed to appear for the examination.				Sr. No.	Title	Marks	1.	Problems/ Programs (Attempt any 5 out of 8)	25 Marks	2.	Journal	05 Marks
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1.	Problems/ Programs (Attempt any 5 out of 8)	25 Marks											
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**Sign of the BOS
Chairman
Dr. Bhausaheb 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**