



SOPHIA COLLEGE (AUTONOMOUS)

Affiliated to the University of Mumbai

Programme: B.A. Economics

Vocational Skills Course

Syllabus for the Academic Year 2024-2025
based on the National Education Policy 2020



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PROGRAMME SPECIFIC OUTCOMES

1	Gain better understanding about the stream of economics
2	Apply the basic ideas of economic theory to understand the consumers and producers behaviour
3	Enable students to do basic calculation of economic concepts
4	Students will be able to apply their analytical skills, knowledge and improve their ability to respond sensitively while dealing with these socio-economic issues
5	Students will be able to critically analyse the implications of governments policies and have opinion on the same based on their competent knowledge in economics and skills in data analysis

Programme: B.A. Economics Economics Major	Semester – III
Course Title: Fundamentals of Calculus for Economics	Course Code: AVSC301
<u>COURSE OBJECTIVES:</u> <ol style="list-style-type: none">1. To provide students with a solid foundation in calculus concepts and techniques relevant to economic analysis2. To demonstrate the applications of calculus in solving economic problems such as optimisation, marginal analysis and elasticity3. To develop students' critical thinking and problem-solving skills through mathematical reasoning4. To prepare students for advanced coursework in economics and related fields that require proficiency in calculus	



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COURSE OUTCOMES:

The learner will be able to :

1. Apply differential techniques to analyse functions and calculate derivatives of economic functions.
2. Utilize optimisation methods, first order and second order derivative tests to solve constrained and unconstrained optimisation problems in economics
3. Interpret economic concepts using calculus including marginal analysis and elasticity
4. Apply integration techniques to calculate total, average and marginal quantities in economic contexts such as consumer's and producer's surplus.
5. Communicate mathematical solutions and economic interpretations effectively both orally and in writing.

Lectures per week (1 Lecture is 60 minutes)	2		
Total number of Hours in a Semester	30		
Credits	2		
Evaluation System	Semester End Examination	Hours	marks
	Internal Assessment	--	50 marks

UNIT 1 Calculus: Differentiation	1.1	Differentiation of single variable functions: Derivatives, Higher order derivatives, Increasing and decreasing functions; convex and concave functions, quasi concavity, quasi convexity,	20 hours
	1.2	Necessary and sufficient conditions for maxima and minima, Optimisation of economic functions.	
	1.3	Differentiation of multivariable functions: Partial Derivatives and second order partial derivatives, Optimisation of multivariable functions, constrained optimisation using lagrange multiplier	
	1.4	Economic applications: obtaining marginal quantities like MP, MRS, MRTS, Price, income and cross price elasticity, optimising Cobb Douglas function, unconstrained optimisation, constrained optimisation of economic functions using lagrange multiplier method	



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UNIT 2 Integral Calculus	2.1	Indefinite integration, method of substitution, integration by parts	10 hours
	2.2	Definite integral and obtaining area under the curve	
	2.3	Economic application of integration: total, average and marginal quantities, present value, consumer's surplus and producer's surplus	

REFERENCES:

1. Dowling Edward, Schaum's Outline of Theory and Problems Introduction to Mathematical Economics, Mc-Graw Hill, third edition.(Year of Publication)
 2. Chiang Alpha, Wainwright Kevin, Fundamental Methods of Mathematical Economics,Mc-Graw -Hill international Edition, fourth edition, 2005.
 3. Simon C.P. and Blume L., Mathematics for Economics,W. W. Norton & Company, 1994
 4. Sydsaeter K, Hammond P.J. and Strom A, Essential Mathematics for Economic Analysis, Pearson Education Limited, 2016.
 5. Pemberton Malcolm and Rau Nicholas, Mathematics for Economists- An Introductory Textbook, Viva Books Publications Limited, Fourth Edition .
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