

 ॥ वसुधैव कुटुम्बकम् ॥ SYMBIOSIS	Symbiosis College of Arts and Commerce (An Autonomous College Affiliated to University of Pune)												
Subject code	Semester	I	II	III	IV	V	VI	M.A.	I	II	III	IV	
Title of Subject	Mathematical Methods for Economics												
Objectives	<p>1. To provide a wider and deeper exposure to the Calculus of functions and their application to the discipline of Economics.</p> <p>2. To help students gain an understanding of how to solve mathematical problems that are common to economic modeling.</p> <p>3. To facilitate the ability of students to demonstrate the economic applications of differentiation, and use it to formulate economic problems.</p> <p>4. To help in developing the ability to accurately translate complex economic problems into mathematical models and hone the skills to solve the problems through a wide array of mathematical techniques.</p>												
Detailed syllabus													
Unit	Contents of the syllabus											Number of hours	
1	<p>1. <u>Economic Models</u> Contents :</p> <p>1.1 Requisites of Mathematical Models in Economics –variables, constants, parameters, equations, identities</p> <p>1.2 Set theory – Basic operations and properties , Introduction to concept of Limit Points- open and closed sets, concave and convex sets</p> <p>1.3 Revisiting Functions, domain, range, types of functions, relative minima and maxima</p> <p>1.4 Limits and continuity of functions</p>											12	
2	<p>2. <u>Static (Equilibrium) analysis</u> Contents :</p> <p>2.1 Meaning of static analysis</p> <p>2.2 Partial Market equilibrium – Linear and non-linear one commodity market model</p> <p>2.3 General Market Equilibrium –Two commodity market model</p> <p>2.4 Limitations of static analysis</p>											10	
3	<p>3. <u>Comparative-Static Analysis</u> Contents :</p> <p>3.1 Meaning of Comparative-static analysis</p> <p>3.2 Derivatives and differentiability of functions</p> <p>3.3 Rules of differentiation for one variable functions</p> <p>3.4 Rules of differentiation for two variable functions</p> <p>3.5. Partial and Total Derivatives, Higher order derivatives</p>											14	

	3.6 Implicit function Theorem 3.7 Applications- Marginal and elasticity concepts, Linear homogeneous functions	
4	4. Optimization Problem Contents : 4.1 Concept of optimal and extreme values, relative maximum and minimum 4.2 First and Second order conditions in relation to maxima, minima , concavity, convexity 4.3 Unconstrained optimization –first and second order conditions 4.4 Langrangian Method of Constrained Optimization 4.5. Hessian and Jacobian Matrices 4.6 Applications – Utility Maximization , Cost Minimization, Output Maximization	10
	5. Dynamic analysis Contents : 5.1 Meaning of Dynamic analysis 5.2 Dynamics and Integration – definite and indefinite integrals 5.3 First and Second order differential equations 5.4 Difference equations 5.5 Applications – Harrod-Domar and Solow’s Model	14
	Total Numberof hours	60

Suggested Reference Books

1. Simon, C. and L. Blume, *Mathematics for Economists*, Norton, London, 1994
2. Chiang, A. C., *Fundamental Methods of Mathematical Economics*, McGraw-Hill, 1984
3. Sydsaeter, K. and P. J. Hammond, *Mathematics for Economic Analysis*, Pearson, Education Asia, 1995
4. Intriligator, M.D., *Mathematical Optimization and Economic Theory*, Prentice-Hall, 1971
5. Roberts B. and D.L. Schultze, *Modern Mathematics and Economic Analysis*, W.W. Norton and Company, 1973
6. Dowling, Edward T. *Introduction to Mathematical Economics*. Tata McGraw-Hill Edition
7. *Mathematics for Economics*, third edition by Michael Hoy, John Livernois, Chris McKenna, Ray Rees and Thanasis Stengos , mitpress
8. Renshaw, G. *Maths for Economics* (2nd Edition, Oxford University Press, 2009)

Journal:

1. <http://www.journals.elsevier.com/journal-of-mathematical-economics/>