Sardar Patel Institute of Technology

Bhavan's Campus, Munshi Nagar, Andheri (West), Mumbai-400058-India
(Autonomous Institute Affiliated to University of Mumbai)

Course Code	Course Name	Teaching Scheme			Credits Assigned			
		L	T	P	L	T	P	Total
BC	Fundamental of Mathematics	2	-	-	Non-Credits			
		Examination Scheme						
		ISE1		ISE2	Total			
		20		20	100 (60% Weightage)			
Student wi3ll be evaluated after completion of 50% syllabus for 20 Marks (ISE1) and at the end of course for 20 Marks (ISE2). Grade equivalent to 'D' (50%-59.99% Marks) or above is considered as 'Satisfactory'. If any of the tasks given is not completed/submitted/shown/evaluated then the corresponding lower grade will be given. Although the grades are given they will not mentioned in final grade card but they are necessary to declare the successful completion of the Non-Credit course.								

Course Objectives: To improve the basic mathematical skills for solving engineering problems.

Course Outcomes:

Course Outcomes	Learners will be able	
	CO1	To find basic derivatives, Integration and limits.
	CO2	To find rank of a matrix and solve system of linear equations using rank.
	CO3	To find partial derivative of a function and apply it to extremise functions.
	CO4	To solve differential equations of first and higher order.
	CO5	To find roots & logarithm of a complex number.

Module No	Module name	Unit No.	Topics	Ref.	Hrs.
1.	**Derivatives**	1.1	Derivative of functions which are expressed in one of the following form a) product of functions, b) quotient of functions, c) derivatives of trigonometric function	1,2,5,6,7	1
		1.2	**Application of Derivatives:** Rolls theorem and Mean value theorem	1,2,5,6,7	1
2.	**Integration**	2.1	Indefinite integrals-methods of integration, substitution method.	1,2,5,6,7	1
		2.2	Evaluation of definite integral 1) bysubstitution, 2) integration by parts,	1,2,5,6,7	1
3.	**Basic of Matrices**	3.1	Rank of Matrix, Normal form	1,2,3,4,6	1
		3.2	Consistency and solution of simultaneous linear homogeneous and	1,2,3,4,6	1

			Non-homogeneous equations. Linear Dependence & independence vectors		
4.	**Partial Differentiation**	4.1	Partial derivatives of first and higher order, Chain Rule & Composite function	1,2,3,4,7	1
		4.2	Euler's theorem on homogeneous functions with two and three independent variables	1,2,3,4,7	1
		4.3	Application of partial derivatives: Maxima and Minima of functions of two variables.	1,2,3,4,7	1
5.	**Differential Equations of first & higher order**	5.1	Exact Differential Equation,	1,2,3,4,	3
		5.2	Linear Differential Equation with constant coefficient- complementary function, particular integrals of differential equation of the type f(D)y = X where X is e^{ax}, sin(ax+b),		
		5.3	cos(ax+b), x^m, $e^{ax}V$, xV.		
6.	**Indeterminate forms**	6.1	Indeterminate forms, L- Hospital Rule	7	1
7.	**Basics of Complex Numbers**	7.1	Roots of complex numbers by De'moivre's Theorem	1,2,3,4	1
		7.2	Relation between circular and hyperbolic function		1
		7.3	Logarithm of complex numbers.		1
				Total	16

References:-

1. Dr.B.S.Grewal," Higher Engineering Mathematics" by Khanna Publication, New Delhi, 42ndEdition.
2. H.K. Das, " Advanced Engineering Mathematics,"by S.ChandPublication.New DelhiTwelfth Revised Edition, 2004
3. Erwin Kreyszig," Advanced Engineering Mathematics,"by John Wiley Eastern Limited, UK Ninth Edition,
4. Shanti Narayan, P. K. Mittal," A Text book of Matrices," by S. Chand publication, New Delhi, Eleventh Edition.
5. Maharashtra state board of secondary and higher secondary education,Pune, Edition 2017.
6. George B. Thomas, Ross L Finney," Calculus and Analytical Geometry by Narosa Publishing House, Mumbai,Ninth Edition.
7. P.N.Wartikar and J.N.Wartikar," A text book of Applied Mathematics, Vol – I and II by Vidyarthi Griha Prakashan, Pune. Ninth Revised Edition,2004.