Syllabus
B. Sc. (nformation Technology)
(Sem.- III)

Title of Paper APPLIED MATHEMATICS

Sr.No.	Heading	Particulars
1	**Description the course :** **Including but Not limited to:**	This course is designed for developing competency of the students in the applications of various mathematical concepts. It is equipped with Complex numbers, Laplace transform, Inverse Laplace transform, Differential equations of first order with first degree and higher degree. This course introduces basic concepts of Algebra and prepares students to study further courses in linear and abstract algebra.
2	**Vertical :**	Vocational Skill Course
3	**Type :**	Theory
4	**Credits :**	2 credits (1 credit = 15 Hours for Theory in a semester, Total 30 hours)
5	**Hours Allotted :**	30 Hours
6	**Marks Allotted:**	50 Marks
7	**Course Objectives(CO):** CO1: Ability to interpret the mathematical results in physical or practical terms for complex numbers. CO2: Know and to understand various types of methods to solve Laplace transform. CO3: Apply the knowledge of Laplace Transforms to solve the problems. CO4: Know and to understand various types of methods to solve differential equation. CO5: Apply the knowledge of differential equations to solve the problems. CO6: Inculcate the habit of Mathematical Thinking through Indeterminate forms.	
8	**Course Outcomes (OC):** OC 1. Familiar with the various forms and operations of a complex number. OC 2: Find the Laplace transform of a function of using definition. OC 3: Find the Inverse Laplace transform of a function of using definition. OC 4: Solve Differential equations of first degree and first order. OC 5: Solve Differential equations of first degree and higher order.	
9	**Modules:-** **Module 1:**	
	1.1 **Complex Numbers**: Complex number, Equality of complex numbers, Graphical representation of complex number (Argand's Diagram), Polar form of complex numbers. Polar form of x+iy for different signs of x.y, Exponential form of complex numbers, Mathematical operation with complex numbers and their representation on Argand's Diagram, Circular functions of complex angles, Definition of hyperbolic function. Relations between circular and hyperbolic functions, Inverse hyperbolic functions. 1.2 **The Laplace Transform**: Introduction. Definition of the Laplace Transform, Table of Elementary Laplace Transforms. Theorems on Important Properties of	**15 Hrs**

	Laplace Transformation, First Shifting Theorem, Second Shifting Theorem, Convolution Theorem, Laplace Transform of Derivatives. 1.3 **Inverse Laplace Transform**: Shifting Theorem, Partial fractions Methods, Use of Convolution Theorem, Solution of Ordinary Linear Differential Equations with Constant Coefficients, Laplace Transformation of Special Function, Periodic Functions, Heaviside Unit Step Function, Dirac-delta Function (Unit Impulse Function).	

	Module 2:	
	2.1 **Equation of the first order and of the first degree**: Separation of variables, Equations homogeneous in x and y, Non-homogeneous linear equations, Exact differential Equation, Integrating Factor, Linear Equation and equation reducible to this form, Method of substitution. 2.2 **Differential equation of the first order of a degree higher than the first**: Introduction, Solvable for p (or the method of factors), Solve for y, Solve for x, Clairaut's form of the equation, Method of Substitution. 2.3 **Linear Differential Equations with Constant Coefficients**: Introduction, The Differential Operator, Linear Differential Equation f(D) y = 0, Different cases depending on the nature of the root of the equation f(D) = 0, Linear differential equation f(D) y = X, The complimentary Function, The inverse operator 1/f(D) and the symbolic expression for the particular integral,	**15 Hrs**

10	**Books and References:** 1. A text book of Applied Mathematics Vol I, P. N. Wartikar and J. N.Wartikar, Pune Vidyathi Griha,7* ,1995 2. A text book of Applied Mathematics Vol II , P. N. Wartikar and J. N. Wartikar, Pune Vidyathi Griha,7" .1995 3. Higher Engineering Mathematics, Dr. B. S.Grewal, Khanna Publications.		
12	**Internal Continuous Assessment: 40%**		**Semester End Examination: 60%**
13	**Continuous Evaluation through:** Class test of 1 of 15 marks Class test of 2 of 15 marks Average of the two: 15 marks Quizzes/ Presentations/ Assignments: 5 marks Total: 20 marks		**Format of Question Paper: External Examination (30 Marks)– 1 hr duration**
14	**Format of Question Paper: (Semester End Examination : 30 Marks. Duration:1 hour)** Q1: Attempt any two (out of four) from Module 1 (15 marks) Q2: Attempt any two (out of four) from Module 2 (15 marks) Or Q1: Attempt any three (out of five) from Module 1 (15 marks) Q2: Attempt any three (out of five) from Module 2 (15 marks)		