SYLLABUS: Mathematics- 1(1st SEM) CSE, IT, CE, EEE, ETC: IIIT BBSR

CODE MA-101	**TITLE OF THE SUBJECT** Mathematics 1
Credits: 3 (3-1-0)	
Pre-requisite for this course:	**Basic knowledge of calculus.**
Course Objective:	The course aims to acquire fundamental knowledge and apply in engineering disciplines.
Course Outcome:	On completion of the course, students must be able to solve industrially applicable problems.
Syllabus	
Module I **[10] Hours**	**Differential Calculus (Functions of one Variable):** Differential Calculus (Functions of one Variable): Rolle's Theorem, Mean value theorem, Taylor's and Maclaurin's theorems with remainders, indeterminate forms, concavity and convexity of a curve, points of inflexion, asymptotes and curvature.
Module II **[15] Hours**	• **ODE:** First order differential equations - exact, linear and Bernoulli's form, second order differential equations with constant coefficients, method of variation of parameters, general linear differential equations with constant coefficients, Euler's equations. • **Sequence & Series**: Sequences and their limits, convergence of series, Ratio test, Power series, Legendre's Equation and Legendre's polynomial.
Module III **[10] Hours**	**Differential Calculus (Functions of several variables):** Limit, continuity and differentiability of functions of several variables, partial derivatives and their geometrical interpretation, differentials, derivatives of composite and implicit functions, derivatives of higher order, Euler's theorem on homogeneous functions, maxima and minima of functions of several variables – Lagrange's method of multipliers.
Module IV **[10] Hours**	**Integral Calculus-1:** Fundamental theorem of integral calculus, mean value theorems, evaluation of definite integrals, Improper integrals, Convergence of improper integrals, tests of convergence, Beta and Gamma functions - elementary properties. Differentiation under integral sign, differentiation of integrals with variable limits - Leibnitz rule, Error function

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Suggested Books:	• Text Books 1. Advanced Engineering Mathematics: Erwin Kreyszig (10^{th} edition). 2. Advanced Engineering Mathematics: Jain Iyengar Jain (5^{th} edition). • **Reference Books** 1. Advanced Engineering Mathematics by O'Neil: CENGAGE 2. Mathematical Methods by Potter Goldberg Publisher: PHI 3. Higher Engineering Mathematics by B. V. Ramana Publisher: TMH