NIRMA UNIVERSITY
Integrated B. Tech. (CSE)-MBA programme
Term - II

L	T	P	C
3	1	0	4

Course Code	CSI0201
Course Title	Calculus

Course Outcomes:

At the end of the course, students will be able to-

1. apply differential and integral calculus to solve engineering problems
2. apply convergence of infinite series in engineering filed
3. deal with functions of several variables that are essential in engineering

Syllabus:

Teaching hours: 30

Unit I **16**

Integral Calculus: Evaluation of definite and improper integrals, Beta and Gamma functions and their properties, Applications of definite integrals to evaluate surface areas and volumes of revolutions, Multiple Integration: double and triple integrals (Cartesian and polar), change of order of integration in double integrals, Change of variables (Cartesian to polar), Applications: areas and volumes by (double integration) Center of mass and Gravity (constant and variable densities).

Unit II **7**

Differential Calculus: Limit, continuity and partial derivatives, total derivative and chain rule, Euler's theorem, Taylor's series in two variables, Tangent plane and normal line, Maxima, minima and saddle points Method of Lagrange multipliers.

Unit III **7**

Infinite Series: Convergence of series, tests for convergence, power series, Taylor's and Maclaurin's series. Series for exponential, trigonometric and logarithmic functions.

Tutorials:

This shall consist 10 tutorials based on the syllabus.

Self-Study:

Self-study contents will be declared at the commencement of the semester. Around 10% of the questions will be asked from the self-study contents.

Suggested Readings^:

1. G B Thomas and R L Finney, Calculus and Analytic geometry; Pearson.
2. T Veerarajan, Engineering Mathematics; McGraw-Hill.
3. B V Ramana, Higher Engineering Mathematics; McGraw-Hill.
4. N P Bali and M Goyal, A text book of Engineering Mathematics; Laxmi Publications.
5. B S Grewal, Higher Engineering Mathematics; Khanna Publishers.
6. E Kreyszig, Advanced Engineering Mathematics; John Wiley & Sons.

L=Lecture, T=Tutorial, P=Practical, C=Credit

^this is not an exhaustive list