

Exam 10

NIRMA UNIVERSITY

<b>Institute:</b>	Institute of International Studies
<b>Name of Programme:</b>	Bachelor of Science (CSE) 2+2 Dual Degree
<b>Course Code:</b>	1MH202
<b>Course Title:</b>	Calculus
<b>Course Type:</b>	Introductory
<b>Year of introduction:</b>	2022-2023

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**Course Learning Outcomes (CLOs):**

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

1. distinguish between different kind of infinite sequence and series
2. use multivariable differential calculus to solve real world problems
3. identify special functions and its applications
4. apply multivariable integral calculus to solve engineering problems

**Syllabus:**

**Total Teaching hours: 45**

Unit	Syllabus	Teaching hours
Unit I	<b>Infinite Sequence and Series:</b> Convergence and divergence of infinite sequence. Calculating limits of sequences, The Sandwich theorem for sequences, The continuous function theorem, L'Hospital's rule, Convergence of series, tests for convergence, power series, Maclaurin's and Taylor's series, Series for exponential, trigonometric and logarithmic functions.	08
Unit II	<b>Multivariable Differential Calculus:</b> Limit, continuity and partial derivatives, total derivative and chain rule, Euler's theorem, Maclaurin's and Taylor's series in two variables, Tangent plane and normal line, Maxima and minima of a function of two variables, Method of Lagrange multipliers.	11
Unit III	<b>Integral Calculus:</b> 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.	12
Unit IV	<b>Multivariate Integral Calculus:</b> double and triple integrals, change of order of integration in double integrals, Change of variables, Applications: area by double integration and volume by triple integration.	14

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**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/ References:**

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. B S Grewal, Higher Engineering Mathematics; Khanna Publishers
5. E Kreyszing, Advanced Engineering Mathematics; John Wiley & Sons  
Iyenger
6. N P Bali and M Goyal, A text book of Engineering Mathematics; Laxmi  
Publications