Course code: Course Title	Course Structure			Pre-Requisite
AM101: Mathematics I	**L**	**T**	**P**	**NIL**
	3	**1**	**0**	

Course Objective: To acquaint the students with the knowledge of series & sequence, single & multiple variable calculus, knowledge of vector calculus and their applications.

S. NO	Course Outcomes (CO)
CO1	Interpret the various types of series and their convergence.
CO2	Apply the differential and integral calculus of single variable in Taylor's expansion, radius of curvature, arc length etc.
CO3	Explain the various concepts of calculus of several variables like partial differentiation, total derivative etc. and apply them to various applications.
CO4	Explain the concept of multiple integrals and apply it to area and volume.
CO5	Interpret the various concepts of differential and integral calculus of vector point functions and apply them to work done by a force and in other applications.

S. NO	Contents	Contact Hours
UNIT 1	Infinite series: Tests for convergence of positive term series (Comparison, Ratio, nth Root, integral, Raabe's, Logarithmic), Alternating series, series, Absolute convergence, Conditional convergence.	8
UNIT 2	Differential & Integral Calculus of single variable: Maclaurin's and Taylor's Expansions, Radius of curvature, Tracing of some standard curves, Applications of definite integral to arc length and surface area (Cartesian and polar coordinates) .	8
UNIT 3	Calculus of several variables: Partial differentiation, Euler's theorem, Total derivative, Taylor's Expansion, Maxima-Minima, Lagrange's method of multipliers, Applications in estimation of error and approximation.	8
UNIT 4	Multiple Integrals: Double integral (Cartesian and polar co-ordinates), change of order of integration, triple integrals (Cartesian, cylindrical and spherical co-ordinates), Applications to area and volume.	9
UNIT 5	Vector Calculus: Scalar and vector point functions, gradient, directional derivative, divergence, curl and their interpretations. Line integral, surface integral and volume integral, Applications to work done by the force, Green's, Stoke's and Gauss divergence theorems.	9
	TOTAL	**42**

REFERENCES		
S.No.	Name of Books/Authors/Publishers	Year of Publication / Reprint
1	Advanced Engineering Mathematics: kreyszig; Wiley-India, 10th edition ISBN- 978-1-119-45592-9	2020
2	Advanced Engineering Mathematics: Jain and lyenger; Narosa, 5th Edition ISBN-978-81-8487-560-7	2019

3	Advanced Engineering Mathematics: Alan Jeffery; Academic Press ISBN-978-93-80501-50-5	2010
4	Calculus and Analytic Geometry: Thomas and Finney; Narosa. ISBN-978-81-85015-52-1	2013
5	Advanced Engineering Mathematics: Dennis G. Zill, Jones and Bartee Publications 6th ed. ISBN-978-12844105902.	2016

Mathematics II