ATMIYA UNIVERSITY
Faculty of Science

Core Course (Practical) For the students admitted from A.Y. 2023-2024 & onwards		
Offering Department: **Mathematics**	Offered to: **B.Sc. Mathematics**	
Semester – II		
Course Code	Course Title	Course Credit and Hours
23UGMT202	**Core Practical 1: Mathematics (Practical Based on Matrix Algebra and Multivariate Calculus)**	**2 Credits- 4 hrs/wk**

Course Description:

This practical course deals with the fundamental aspects of Mathematics. The learners are benefited with this course as a progress to the broad areas of Algebra and Calculus. This course is designed to give more clarity of concept practically which they learn in theory course. In this course students will able to practice problem solving of concept of matrix algebra and calculus.

Course Purpose:

This Practical course aims to provide more clarity to basic understanding of matrix algebra and multivariate calculus provides us with the tools to do so by extending the concepts that we find in calculus. This is designed in such a way that learners will able to understand the application of concept of matrices.

Course Outcomes: Upon completion of this course, the learner will be able to

CO No.	CO Statement	Blooms taxonomy Level (K_1 to K_6)
CO_1	Define and utilize the concept of matrix	K1,K2
CO_2	Understand the concept of Rank, determinant and Cayley Hamilton theorem.	K2,K3
CO_3	Solve the systems of linear equations using concept of matrix	K1,K2,K3
CO_4	Sketch curves in Cartesian and polar coordinate systems	K2,K3,K4
CO_5	Find the length of an arc and area enclosed by the given curve	K1,K2

List of Practical		
Sr.	**Experiments**	**Hrs**
1	Problems based on Adjoint and Inverse of matrices.	4
2	Problems based on rank of matrices.	4
3	Problems based on Determinant and eigenvalues	4
4	Problems based on Cayley Hamilton theorems.	4
5	Problems based on application of matrices.	4
6	Problems based on curve tracing of Cartesian curves.	4
7	Problems based on curve tracing of parametric curves.	4
8	Problems based on curve tracing of polar curves.	4
9	Problems based on rectification of the curve.	4
10	Problems based on area of curve.	4

Pedagogic Tools:

- Chalk and board
- Power point presentation
- Seminars
- Problem solving.

Text books:

- N. Saran and J. K. Goyal, (2010), Introduction to Matrices, 20th Edition, Pragati Prakashan.
- Gorakh Prasad (2015), Integral Calculus. Pothishala Pvt. Ltd., Allahabad.

Reference books:

- Howard Anton and Chris Rorres, (2014), Elementary Linear Algebra, 11th Edition, Wiley.
- George B. Thomas Jr., Joel Hass, Christopher Heil & Maurice D. Weir (2018). Thomas' Calculus (14th edition). Pearson Education.
- Jerrold Marsden, Anthony J. Tromba & Alan Weinstein (2009). Basic Multivariable Calculus, Springer India Pvt. Limited.

Suggested reading / E-resources:

- https://ecampusontario.pressbooks.pub/linearalgebrautm/chapter/chapter-2-matrix-algebra/
- https://www.scribd.com/presentation/489163932/4-Quadrature-rec

Suggested MOOCs:

- https://nptel.ac.in/courses/111106051
- https://ugcmoocs.inflibnet.ac.in/index.php/courses/view_ug/312

Methods of Assessment & Tools:

Components of CIA: 20 marks.

Sr. No.	Component	Content	Duration	Marks	Sub Total
A	Test 1	1-5 Experiments	$1\frac{1}{2}$ hours	35	7
	Test 2	6-10 Experiments	$1\frac{1}{2}$ hours	35	7
B	Attendance, Regularity and Class Activities				6
				Grand Total	**20**
Class activity	• Quiz • problem solving session • Handbook				