RKUNIVERSITY	SYLLABUS
Course Title	**MATHEMATICS-II**
Course Code	BMT201
Course Credit	Lecture : 4
	Practical : 3
	Tutorial : 0
	Total : 7

Detailed Syllabus:

Sr. No	Name of chapter & Details	Session Allotted
	SECTION-I	
1	**Linear Algebra:** Vector spaces and their elementary properties, subspaces, Linear dependence and independence, basis and dimension, direct sum of vector spaces.	**7**
2	**Matrices:** Definitions, Notations, Types of matrices, Algebra of Matrices, Determinants, Special matrices, Elementary Transformations (or operations), Rank of a matrix, Determination of rank of a matrix, Inverse of a matrix by Elementary transformations, Consistency of a system of linear simultaneous equations.	**10**
3	**Eigen values and Eigen vectors of matrices**: Characteristic equation, Eigen values and Eigen vectors of a matrix, Cayley-Hamilton's theorem and its use in finding inverse of a matrix, Application of matrices to solve a system of linear (both homogeneous and non-homogeneous) equations.	**7**
4	**Applications of matrices**: Balancing Chemical equations by using Matrix, Solve Chemical Linear problems by using Matrix. Find area and volume by using Matrix.	**4**
	SECTION-II	
5	**Partial Differentiation:** Functions of two or more variables, Continuous functions of two variables, Continuity at a point, Limit of a function of two variables, Partial Derivatives, Geometrical representation of a Function of two variables, Homogeneous Functions, Theorem on Total Differentials; Composite Functions; Differentiation	**10**

	of Composite functions; Implicit Function; Jacobians; Definition, Jacobian of Function of Function, Jacobian of Implicit Functions	
6	**Multiple Integrations:** Double integral, Change of order of integration, Change of variable in multiple integral, Triple integral	**10**
7	**Applications of Multiple Integrations:** Find the area & volume by using multiple integrals. Find density and mass by using multiple integrals.	**8**

List of Practicals (6 hour per week)

By Using Scilab performing all the experiments:

1. (A) To input row vectors and column vectors.

   (B) To input square and rectangular matrices.
2. (A) To obtain addition, subtraction and multiplication, division of matrices.

   (B) To obtain sub matrices of given matrix and to delete row and columns.
3. (A) To find minors, cofactors, and adjoint of a matrix.

   (B) To find inverse of the matrix using adjoint of a matrix.

   (C) To learn functions zeros, ones, eye, rand, det(), inv(), function for transpose.
4. To draw the graph of a circle.
5. To draw the graph of a parabola.
6. To draw the graph of an ellipse.
7. To draw the graph of a hyperbola.
8. To draw graph of trigonometric functions.
9. To draw graph of inverse trigonometric functions.
10. To draw graph of exponential functions and logarithmic functions.
11. To draw graph of hyperbolic functions.

Instructional Method and Pedagogy:

1. Lectures will be conducted with the aid of multi-media projector, black board, Audio/Video clips etc. relevant to the content.
2. Assignments based on course content will be given to the students at the end of each unit/topic and will be evaluated at regular interval.
3. Surprise tests/Quizzes/Tutorials will be conducted.
4. The course includes a laboratory, where students have an opportunity to build an appreciation for the concepts being taught in lectures.
5. Minimum ten practical's shall be there in the tutorial related to course contents.

Students Learning Outcomes:

At the end of the course the students will be able to:

1. **Understand** different concept of matrices and able to relate them with real life problems.

2. **Solve** linear systems of equations of chemistry by using concepts of matrices.
3. **Balance** chemical equations by using matrices.
4. **Find** area and volume of chemical or liquid by using multiple integrals.
5. **Realize** importance of Matrices & Multiple integrals in Physical calculus, Quantum & Wave mechanics, Thermodynamics.

Reference Books:

1. Matrix Methods and Differential Equations, Wynand. S. Verwoerd, 1st Edition.
2. Theory and Problems of Matrix Operations by Richard Bronson, Tata McGraw-Hill, 2008.
3. Integral Calculus by Shanti Narayan, S. Chand Higher Academic, Revised Edition.
4. Differential equations by Shanti Narayan, S. Chand Higher Academic, 10th Revised Edition.
5. A Text book of Calculus, S. C. Arora and Ramesh Kumar, Pitamber Publishing Company Ltd., Delhi.
6. Introduction to Scilab by Michael Baudin from the Scilab consortium, 2010.