**Aadishakti DhandaiMata Shikshan Prasarak Sanstha's**

**LATE ANNASAHEB R D DEORE ARTS AND SCIENCE COLLEGE, MHASADI**

## Department of Mathematics

# Outcomes of the Mathematics Courses taught in the B Sc Programme

| Class | Course | Course Outcomes |
|---|---|---|
| F.Y.B.Sc | MTH 101: Matrix Algebra | Upon successful completion of this course the student will be able to:<br>a) understand concepts on matrix operations and rank of the matrix.<br>b) understand use of matrix for solving the system of linear equations.<br>c) understand basic knowledge of the eigen values and eigen vectors.<br>d) apply Cayley-Hamilton theorem to find the inverse of the matrix.<br>e) know the matrix transformation and its applications in rotation, reflection, translation. |
| F.Y.B.Sc | MTH 102 – MTH 102 –Calculus of Single Variable | Learning Outcomes: Upon successful completion of this course the student will be able to:<br>a) understand basic concepts on limits and continuity. b) understand use of differentiations in various theorems. c) know the Mean value theorems and its applications.<br>d) make the applications of Taylor's, Maclaurin's theorem. e) know the applications of calculus.<br>f) Determine the derivative of a function using the limit definition.<br>g) Interpret the derivative as the slope of a tangent line to a graph, the slope of a graph at a point, and the rate of change of a dependent variable with respect to an independent variable<br>h) Use the first and second derivatives to analyze and sketch the graph of a function, intervals on which the |

| | | graph is increasing, decreasing. |
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| F.Y.B.Sc | MTH 103(A): Coordinate Geometry MTH 103(A): Coordinate Geometry | Students can visualize geometrical concepts and draw two dimensional figures and can find their standard forms by shifting and rotation of axes. Students also can draw three dimensional figures and their equations particularly Sphere, Cone and Cylinder. |
| F.Y.B.Sc | MTH 103(B): Discrete Mathematics MTH 103(B): Discrete Mathematics | Students are able to understand the concepts of relations, coding and decoding, mathematical logic, Boolean algebra |
| FYBSc | MTH 201: Ordinary Differential Equations | a) understand basic concepts in differential equations. b) understand method of solving differential equations ) understand use of differential equations in various fields. |
| FYBSc | MTH 202: Theory of Equations | Students can find out roots of any equation of degree less than or equal to five. Theory of equations is highly useful in various subjects like algebra, linear algebra, calculus, ordinary and partial differential equations etc |
| F.Y.B.Sc | MTH 203(A): Laplace Transforms | Know about piecewise continuous functions, Dirac delta function, Laplace transform and its properties. Know about Unit step, Periodic, Error, Gamma and Null functions. Understand Laplace and Inverse Laplace transforms. Know the basic properties of Laplace and inverse Laplace transforms. Calculate the Laplace transform of basic functions using the definition. Find the Laplace transform of derivatives of functions. Compute inverse Laplace transforms. Solve ordinary differential equations using Laplace transforms. |
| F.Y.B.Sc | MTH-203(B) Numerical Methods Numerical Met | Understand basic concepts of methods of solutions of equations viz. bisection, iteration, Newton-Raphson methods and method of false position. Understand methods of curve fitting viz. Gauss's forward and backward difference formulae and Lagrange's interpolation formula. Use of curve fitting such as least square, polynomials and exponential fittings for set of given dada. Use Taylor's series, Euler's method, Modified Euler's methods, RangeKutta methods for solving ordinary differential equations. |
| SYBSc | MTH -301: Calculus of Several Variables | a) limit and continuity of functions of several variables b) fundamental concepts of multivariable Calculus. c) series expansion of functions. d) extreme points of function and |

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| | | their maximum, minimum values at those points. e) meaning of definite integral as limit as sums. f) how to solve double and triple integration and use them to find area by double integration and volume by triple integration. |
| **SYBSc** | MTH -302(A): Group Theory | a) understand group and their types which is one of the building blocks of pure and applied mathematics. b) understand Lagarnge, Euler and Fermat theorem c) understand concept of automorphism of groups d) understand concepts of homomorphism and isomorphism e) understand basic properties of rings and their types such as integral domain and field. |
| **SYBSc** | MTH -302(B): Theory of Groups and Codes | a) understand group structures which is useful to understanding ideas of modern mathematics. b) understand solutions to polynomial equations c) understand permutation groups d) understand concepts of homomorphisms and isomorphisms e) Students will understand basic concepts in codding theory. |
| **SYBSc** | MTH 304: Set Theory and logic | a) Uses of the language of set theory, designining issues in different subjects of mathematics b) understand the issues associated with different types of finite and infinite sets via countable uncountable sets c) knowledge of the concepts and methods of mathematical logic, set theory, relation calculus, and concepts concerning functions which are included in the fundamentals of various disciplines of mathematics d) understanding the role of propositional and predicate calculus e) able to provide the logical mathematical reasoning, formulate theorems and definitions |
| **SYBSc** | MTH -401: Complex Variables | a) The course is aimed to introduce the theory for functions of complex variables b) Students will understand the concept of analytic function c) Students will understand the Cauchy Riemann Equations d) Students will understand harmonic functions e) Students will understand complex integrations f) Students will understand calculus of residues. g) Students will acquire the skill of contour integrations. |
| **SYBSc** | MTH-402(A): Differential Equations | a) Students will aware of formation of differential equations and their solutions<br> b) Students will understand the concept of Lipschitz condition<br>c) Students will understand method of variation of parameters for second order L.D.E.<br>d) Students will understand simultaneous linear differential equations and method of their solutions<br>e) Students will understand Pfaffian differential equations and method of their solutions<br>f) Students will understand difference equations and their solutions |
| **SYBSc** | MTH 404: Vector Calculus | a) understand scalar and vector products b) understand vector valued functions and their limits and continuity and |

use them to estimate velocity and acceleration of partials. c) Calculate the curl and divergence of a vector field. d) Set up and evaluate line integrals of functions along curves.