Arts, Commerce and Science College, Narayangaon.

F.Y.B.Sc. – Mathematics (As per NEP-2020)

COURSE OUTCOMES (CO's)

Semester – I

❖ MTS 101 MJ-Algebra

The student will able

1. To know the concept of divisibility.
2. To find Greatest Common Divisor of integers using the Euclidean algorithm.
3. To apply Fermat's theorem.
4. To understand the concept of Euler's phi function.
5. To apply De-Moivre's theorem to find roots of complex numbers.
6. To understand the method of finding roots of polynomials and relationship between roots and coefficients of a Polynomial.

❖ MTS-102 MJ: Calculus –I

The student will able

1. To classify real numbers and recognize different properties that exits with real numbers.
2. To understand the concept of supremum and infimum and their applications.
3. To understand definition of continuity to pure and applied problems.
4. To draw the graphs of algebraic and transcendental functions considering limits and continuity.
5. To apply these concepts for advanced study in Mathematics (Real Analysis, Complex Analysis, Topology)
6. To apply limit and continuity concept in physical, chemical, and biological sciences.

❖ MTS-121 VSC: Foundation of Mathematics

The student will able

1. To describe sets and perform basic set operations.
2. To construct and evaluate logical arguments.
3. To use mathematical induction to prove theorems.
4. To prove or disprove statements using counter examples and proof by contradiction.
5. To define and identify equivalence relations and classify functions.
6. To compare the cardinalities of different sets.

❖ MTS-104 IKS: Ancient Indian Mathematics

The student will able

1. To understand the general concept of Indian Knowledge System.
2. To understand the overall contribution of Ancient Indian Mathematician.
3. To solve problems based on methods derived by Ancient Indian Mathematicians.
4. To compare some old methods with the modern methods.
5. To understand the techniques derived by Ancient Indian Mathematicians.
6. To appreciate the ingenuity of Ancient Indian Mathematicians.

❖ SEC-107 MTS: Python-I

The student will able

1. To write python programs and develop a small application.
2. To develop logic for problem solving.
3. To be familiar about the basic constructs of programming such as data, operations, conditions, loops, functions etc.
4. To be familiar with string and its operation.
5. To develop basic concepts of function and terminology.
6. To determine the methods to create and develop Python programs by utilizing the data structures like lists and tuples.

SEMESTER – II

❖ MTS-151 MJ: Matrix Algebra

Course Outcomes : The student will be able to

1. Understand the various types of matrices and its properties.
2. Convert matrix to echelon form using elementary row operations.
3. Learn method to solve the system of linear equations.
4. Understand the concept of determinant and evaluating determinant by different methods.
5. Solve problems using properties of determinant.
6. Apply the concept of matrices and determinant to the problems in chemistry, electronics, cryptography, etc.

❖ MTS-152 MJ: Calculus - II

Course Outcomes: The student will able to

1. Understand differentiation and fundamental theorem in differentiation.
2. Apply Mean value theorems and it's applications.
3. Find the nth derivatives of the function, evaluate nth derivative of product function.
4. Apply L'Hospital rules to find the limits in indeterminate forms.
5. Find series expansions of some standard functions.
6. Decide nature of functions and find its extreme values.

❖ MTS-171 VSC: R Programming

Course Outcomes: The students will be able to:

1. Demonstrate how to install R software.
2. Explain the use of data structures and conduct arithmetic operations.
3. Using R, solve complicated differentiation and integration problems.
4. Perform different operations on matrices and test their characteristics.
5. Visualize the data using a diagrammatic form.
6. Import datasets in R and export outputs from R

❖ SEC-157: MTS Python-II

Course Outcomes:

1. To write python program and develop maps using dictionary.
2. To develop logic for 2D graphics.
3. Demonstrate the use of Python in mathematics such as matrix algebra.
4. To be familiar about basic math built in functions such as sine, cosine, etc.
5. To be familiar with complex numbers.
6. To write Python programs to handle matrices and vectors using NumPy.

A student whose major is other than Mathematics -
Can choose any one of these subjects as "Minor subject."

B) Mathematics for Commerce and Management

Course Outcomes: The student will able

1. To understand the concepts of ratio, proportion, percentage, interest, annuity, shares.
2. To solve the problems using the concepts of ratio, proportion, percentage, interest, annuity, shares.
3. To analyze financial problems using the concepts of ratio, proportion, percentage, interest, annuity, shares.
4. To evaluate financial conditions based on one's income/expenditure using the concepts of ratio, proportion, percentage, interest, annuity, shares.
5. To prepare monthly family budget based on one's income/expenditure using the concepts of ratio, proportion, percentage, interest, annuity, shares.
6. To have sufficient knowledge to manage personal finance.

OR

F) Mathematics For Competitive Examinations

Course Outcomes: The student will able

1. To understand the basic concepts of quantitative ability.
2. To acquire satisfactory competency in use of mathematical reasoning.
3. To develop theoretical, applied and computational skills.
4. To solve campus placements aptitude papers covering quantitative ability.
5. To compete in various competitive exams like Banking, CAT, CMAT, GATE, GRE, GATE, MPSC, UPSC etc.
6. To build up quantitative aptitude and personality development.

A student whose major is other than the faculty of Science and Technology
Can choose as an Open Elective (OE).

OE-105 MTS : Basic Mathematics- I

Course Outcomes: The student will able

1. To understand the concepts of numbers and integers and able to develop skills in basic operations of integers to cultivate the right understanding and regain numerical aptitude.
2. To understand concepts of H.C.F. and L.C.M. of numbers, square root and cube Root and ability to apply in real-world problems.
3. To understand concepts of ratio, proportion, percentage and be able to cultivate the right understanding regaining numerical aptitude.
4. To understand concepts of average, profit and loss develop a logical approach toward analytical approach to real-world problems.
5. To provide a platform for the students to build the fundamentals of Basic Mathematics for competitive examination preparation strategy.
6. To establish a framework for the students to help acquire the knowledge and expertise necessary to secure employment opportunities in the government sector.

Course Outcome- S. Y. B. Sc. (Mathematics)

❖ Course Title: - MT-231 Calculus of Several Variables

➢ Course Outcome

1. Gain Knowledge of fundamental concepts of real numbers in n-dimensions.
2. Verify the value of the limit of a function at a point using the definition of the limit in R^2
3. Find the extreme value in 2 dimensions.
4. To Study multiple integration.

❖ Course Title: - MT-232- Numerical Methods and Its Application

➢ Course Outcome

1. To apply appropriate numerical methods to solve the problem with most accuracy.
2. Using appropriate numerical methods determine approximate solution of ODE and system of linear equation.

❖ Course Title: - MT-233 Practical Course based on MT-231 and MT-232

➢ Course Outcome

1. Problem solving on calculus of several variables and numerical methods and it's applications.
2. Introduction to application of mathematics in real life.
3. To demonstrate used of interpolation method in numerical analysis.

❖ Course Title: - MT-241 Linear Algebra

➢ Course Outcome

1. Introduction to vector space and subspace.
2. Use computational techniques and algebraic skills essential for the study of systems of Linear equations, matrix algebra, vector spaces, eigenvalues and eigenvectors, orthogonality and diagonalization. (Computational and Algebraic Skills).

❖ **Course Title: - MT-242(A) Vector Calculus**

➢ **Course Outcome**

1. Introduction to vector valued function.
2. Gain confidence in proving theorems and solving problems.
3. Develop theoretical, applied and computational skills.

❖ **Course Title: - MT-243 Practical Course based on MT-241 and MT-242**

➢ **Course Outcome**

1. Problem solving on linear algebra and vector calculus.
2. Use computational techniques and algebraic skills essential for the study of systems of Linear equations, matrix algebra, vector spaces, eigenvalues and eigenvectors, orthogonality and diagonalization.

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