School of Studies in Mathematics

Pt.Ravishankar Shukla University Raipur

Syllabus

Choice Based Credit Course in

Mathematics

Session: 2023-24 & onwards

Approved by

Board of Studies in Mathematics

(Meeting on 16th January 2023)

Elementary Mathematics for Social Sciences

Learning Outcomes:

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

1. Understand the basic concept of real numbers, and simplify expressions involving polynomial, radical, rational, exponential, or logarithmic terms using appropriate properties and rules.
2. Understand the graph, Linear models, Linear and Rational inequalities and their applications.
3. Understand the Exponential and Logarithmic functions and applications.
4. Understand the system of linear equations and applications of matrices.

Contents:

Unit-I: Algebra and Equations:
The Real Numbers, Polynomials, Factoring, Rational Expressions, Exponents and Radicals, First Degree Equations, Quadratic Equations.

Unit-II: Graphs, Lines, and Inequalities
Graphs, Equations of Lines, Linear Models, Linear Inequalities, Polynomial and Rational Inequalities.

Unit-III: Functions and Graphs
Functions, Graphs of Functions, Applications of Linear Functions, Quadratic Function and Applications, Polynomial Functions, Rational Functions.

Unit-IV: Exponential and Logarithmic Functions
Exponential Functions, Applications of Exponential Functions, Logarithmic Functions, Logarithmic and Exponential Equations.

Unit-V: Systems of Linear Equations and Matrices
Systems of Two Linear Equations in Two Variables, Larger Systems of Linear Equations. Applications of Linear Equations, Basic Matrix Operations, Matrix Products and Inverses, Applications of Matrices.

Recommended Book:

M.L.Lial,. T.W.Hungerford, J.P.Holcomb, B.Mullins: Mathematics with Applications in the Management, Natural and Social Sciences, 7th ed. Pearson.

Mathematics for Social Sciences

Learning Outcomes:

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

1. Understand the basic concept of Linear programming and their applications.
2. Understand the Sets and Probability and their applications.
3. Understand the Limits and Derivatives of a functions and their applications.
4. Understand the Antiderivatives, Integration and their applications of integrals.

Contents:

Unit-I: Linear Programming

Graphing Linear Inequalities in Two Variables, Linear Programming: The Graphical Method, Applications of Linear Programming, The Simplex Method: Maximization, Maximization Application, The Simplex Method: Duality and Minimization , The Simplex Method: Nonstandard Problems.

Unit-II : Sets and Probability

Sets, Applications of Venn Diagrams and Contingency Tables, Introduction to Probability, Basic concepts of Probability, Conditional Probability and Independent Events, Bayes' Formula.

Unit-III: Differential Calculus

Limits, One-Sided Limits and Limits Involving Infinity, Rates of Change, Tangent Lines and Derivatives, Techniques for Finding Derivatives, Derivatives of Products and Quotients, The Chain Rule, Derivatives of Exponential and Logarithmic Functions, Continuity and Differentiability.

Unit-IV: Applications of the Derivative

Derivatives and Graphs, The Second Derivative, Optimization Applications, Implicit Differentiation, Related Rates, Curve Sketching.

Unit-V: Integral Calculus

Antiderivatives, Integration by Substitution, Area and the Definite Integral, The Fundamental Theorem of Calculus, Applications of Integrals, Differential Equations.

Recommended Book:

M.L.Lial,. T.W.Hungerford, J.P.Holcomb, B.Mullins: Mathematics with Applications in the Management, Natural and Social Sciences, 7th ed. Pearson.