

CURRICULUM GUIDELINES
FOR
APPLIED MATHEMATICS (840)

Class –XI (2018-19)

1. COURSE OVERVIEW

COURSE TITLE: APPLIED MATHEMATICS

Learning objective and outcomes- Mathematical thinking is linked to subjects where mathematics can be productively applied. Studying applied mathematics will enhance learning and understanding of Physics, Chemistry, Economics, Accountancy and other Skill based subject etc. Through this course students will learn problem solving, reasoning and proving, reflecting, selecting tools and computational strategies, connecting, representing and communicating mathematical thinking.

2. SCHEME OF UNITS AND ASSESSMENT

CLASS XI			
	Unit	No. of Periods (in hour)	Marks
PART A	Theory		
	Unit 1: Sets, Relations And Functions	16	10
	Unit 2: Trigonometry And Vectors	18	10
	Unit 3: Algebra	20	18
	Unit 4: Linear Inequations And Coordinate Geometry	14	12
	Unit 5: Statistics And Commercial Mathematics	26	20
	Unit 6: Permutation, Combination, Binomial Theorem Probability	16	10
	Total	110	80
PART B	Practical Work		
	Project Work	12	08
	Practical Exam	18	12
	Total	30	20
	Total	140	100

3. UNIT CONTENTS

CLASS XI (2018-19)

APPLIED MATHEMATICS

Theory

Time: - 3 Hours

80 Marks

UNIT 1: SETS, RELATIONS AND FUNCTIONS

10 Marks

Sets and their representation, Empty set, Equal sets, Subset, Power Set Ordered pair, Cartesian product, Relation, Domain, Co domain, Range, Equivalence relation, One-One, Onto and Into functions Logarithm as a special function, Interval in which logarithm becomes one-one and onto, Laws of logarithm

UNIT 2: TRIGONOMETRY

10 Marks

Trigonometric functions in different quadrants, Trigonometric ratios of allied angles, Trigonometric ratios of sum and difference of 2 angles, Trigonometric ratios of multiple and sub multiple angles, Trigonometric Equations and solutions.

UNIT 3: ALGEBRA

18 Marks

1. Complex numbers-concept of iota, Imaginary numbers, arithmetic operations on complex numbers (addition, subtraction, multiplication, division) Conjugate and modulus, Standard form $a+ib$ of a complex number, square root of a complex number, Representation of a complex number in geometric form, vector form, polar form
2. Quadratic equations: Solution of a quadratic equation with non real roots for real number coefficients and complex number as coefficient.
3. Arithmetic Progression- n th term and sum to n terms of an A.P, Arithmetic mean, Applications of A.P
4. Geometric Progression: n th term and sum to n terms of a G.P. Geometric mean, relation between Arithmetic and Geometric mean, Special sums $\sum_{k=1}^n k$, $\sum_{k=1}^n k^2$, $\sum_{k=1}^n k^3$
5. Partial Fractions-Definition of polynomial fraction proper and improper fraction and definition of partial fraction.

UNIT 4: LINEAR INEQUATIONS AND COORDINATE GEOMETRY

12 Marks

1. Graphical solution of a linear Inequation in 2 variables, solution set for simultaneous linear in equation
2. Slope of a line, various forms of equations of a line-, point slope form, slope intercept form, two point form, intercept form and normal form, General Equation of a line.
3. Conic Sections-circle, parabola,. Standard equation of a circle and parabola

UNIT 5: STATISTICS AND COMMERCIAL MATHEMATICS

20 Marks

Measures of dispersion-Range, mean deviation from mean, Mean deviation from median for discrete frequency distribution and continuous frequency distribution Variance and standard deviation for discrete and continuous frequency distribution Demographic Statistics-Infant Mortality Rate, Crude Death Rate, Standardized Death Rate, Cost of Living Index Number, Wholesale Price Index Simple and Compound Interest, Profit, Loss, Discount and Percentage, Commission, Brokerage, Ratio Proportion and their properties, Insurance, Annuity

UNIT 6: PERMUTATION, COMBINATION, BINOMIAL THEOREM AND PROBABILITY

10 Marks

Fundamental Principle of Counting, Factorial $n!$, n_{pr} and n_{cr} and their relation. Statement of Binomial theorem for positive integral indices, general and middle term binomial expansion. Conditional Probability, Multiplication Theorem on Probability, Independent Events.

PRACTICALS

20 Marks

ASSIGNMENT (ANY 6)

12 Marks

1. Data analysis using Excel sheet
2. Demographic data analysis- CDR, STDR, CLI no. etc
3. Probability investigation sheet from online resource
4. Assignment on graphs and correlation to slope and different forms of equation of a line.
5. Venn diagram solution on Union, Intersection and complement of a set
6. Solving assignment of word problem using Venn diagrams(limited to 3 sets)
7. Graphing trigonometric functions
8. Identifying intervals where trigonometric functions are one-one.
9. Making insurance sheets

PROJECT- (SUGGESTED)

8 Marks

1. Application of coordinate system in real life
2. Visit to any Industrial unit to collect data and analyse it
3. Creating games using probability concept, adding constraints or enablers increasing win ability or making the game need more skills.
4. Analytical proofs in coordinate geometry
5. Power Point Presentation documenting investigation and research on any concept in the syllabus