

Name of Teacher: ANUP SINGH  
 Class: B.Sc 3<sup>rd</sup> Semester 5<sup>th</sup>  
 Paper : Real analysis

Session:2023-24

<b>Week 1</b>	
	Introduction to syllabus
	Riemann integral definitions
<b>Week 2</b>	
	Theorems
	Examples
	Darboux's theorem
	Conditions of integrability
<b>Week 3</b>	
	Integrability of continuous functions
	Examples
	Integrability of monotonic functions
	Theorems
	Riemann sum
	Second definition of integrability
<b>Week 4</b>	
	Theorems
	Examples & Exercise
	Properties of riemann integral
	Theorems
	Assignment 1
<b>Week 5</b>	
	First mean value theorem
	Examples
	Primitive of a function
	Mean value theorem of integral calculus
	Examples & Exercise
<b>Week 6</b>	
	Improper integral
	Solved examples & Exercise
	Comparison tests
<b>Week 7</b>	
	Theorems
	Examples & Exercise
	General test for convergence
	Problems
<b>Week 8</b>	
	Test
	General test for convergence at infinity
	Examples
	Frullani's integral
	Examples
<b>Week 9</b>	
	Integral as a function of a parameter
	Continuity of the integral
	Examples & Exercise

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Session: 2022

	Introduction to metric space and Definition Examples
<b>Week 10</b>	
	Bounded sequence Bounded function Induced metric Examples Semi metric space Examples
<b>Week 11</b>	
	Bounded and unbounded metric space Init test Open and closed sets Open sphere/closed sphere Examples
<b>Week 12</b>	
	Interior point and nbd of a point Examples Interior of a set Theorems Examples
<b>Week 13</b>	
	Theorems Exterior points and exterior of a set Subspaces of a metric space Theorems Examples
<b>Week 14</b>	
	Sequences in metric spaces Theorems Cauchy's sequence Examples
<b>Week 15</b>	
	Cantor's intersection theorem Contraction principle in a metric space Continuous functions Uniform continuity Assignment 2
<b>Week 16</b>	
	Compact set and compact metric space Connectedness in metric spaces

Lesson Plan  
 Name of Teacher:  
 Class: B.Sc.  
 Week 1  
 Week 2  
 Week 3

**Lesson Plan of Paper : Calculus**

Session: 2023-24

Name of Teacher: ANUP SINGH

Class: BSc. /BA 1st year Sem. 1st

Week 1	
	Definition of the limit of a function. Basic properties of limits, Continuous functions
Week 2	
	Classification of discontinuities. Indeterminate forms
Week 3	
	Differentiability. Successive differentiation. Assignment-1
Week 4	
	Leibnitz theorem. Maclaurin and Taylor series expansions
Week 5	
	Asymptotes in Cartesian coordinates, intersection of curve and its asymptotes, asymptotes in polar coordinates.
Week 6	
	Curvature, radius of curvature for Cartesian curves, parametric curves, polar curves.
Week 7	
	Newton's method. Radius of curvature for pedal curves. Test
Week 8	
	Tangential polar equations. Centre of curvature. Circle of curvature.
Week 9	
	Chord of curvature, evolutes. Tests for concavity and convexity. Points of inflexion. Multiple points. Cusps, nodes & conjugate points. Type of cusps.
Week 10	
	Tracing of curves in Cartesian, parametric and polar coordinates.
Week 11	
	Reduction formulae. Assignment-2
Week 12	
	Rectification, intrinsic equations of curve.
Week 13	
	Quadrature (area) Sectorial area..
Week 14	
	Area bounded by closed curves.
Week 15	
	Volumes and surfaces or solids of revolution.
Week 16	
	Theorems of Pappu's and Guldin

**Lesson Plan of : Introductory Mathematics****Name of Teacher: Mr. Anup singh****Class: B.A 1st year 2nd Sem. (1st Sem.)**

<b>Week 1</b>	Sets and their representations Empty set, Finite and infinite sets Subsets, Equal sets, Power sets, Universal set, Union and intersection of sets Examples.
<b>Week 2</b>	Difference of two sets Complement of a set Venn diagram, De-Morgan's laws and their applications. Examples.
<b>Week 3</b>	An introduction to matrices and their types Symmetric and skew-symmetric matrices, Minors, Co-factors. Operations on matrices, Test.
<b>Week 4</b>	Determinant of a square matrix, Adjoint and inverse of a square matrix, Solutions of a system of linear equations up to order 3. Assignment
<b>Week 5</b>	Complex numbers, Operations on complex numbers, Modulus and argument of a complex number. Examples.
<b>Week 6</b>	Linear inequalities, Algebraic solutions of linear inequalities in two variables and their graphical representation. Examples. Test
<b>Week 7</b>	Quadratic equations, Solution of quadratic equations. Examples.
<b>Week 8</b>	Arithmetic progression, Geometric progression Examples.

<b>Week 9</b>	
	Harmonic progression
	Arithmetic mean (A.M.)
	Examples.
	Test
<b>Week 10</b>	
	Geometric mean (G.M.), Harmonic mean (H.M.), Relation between A.M., G.M. and H.M
	Assignment
	Examples.
<b>Week 11</b>	
	Straight lines: Slope of a line and angle between two lines
	Examples.
<b>Week 12</b>	
	Different forms of equation of a line: Parallel to co-ordinate axes, Point-slope form, Slope-intercept form, Two-point form, General form;
	Examples.
<b>Week 13</b>	
	Distance of a point from a straight line. Standard form of a circle and its properties.
	Test