DEPARTMENT OF MATHEMATICS
LESSION Plan
Session 2023-24
SEMESTER – III

Name of Teacher: Haricharan Mahanta

Paper Allotted: MTMGCOR03T(Real Analysis)

Month	Paper	Topic	No of classes
September 2023 (25.09.2023)	MTMGCOR03T(Real Analysis)	Finite and infinite sets, examples of countable and uncountable sets. Real line, bounded sets, suprema and infima, completeness property of R, Archimedean property of R, intervals.	8
October 2023	MTMGCOR03T(Real Analysis)	Concept of cluster points and statement of Bolzano-Weierstrass theorem. Real Sequence, Bounded sequence, Cauchy convergence criterion for sequences. Cauchy's theorem on limits, order preservation and squeeze theorem, monotone sequences and their convergence (monotone convergence theorem without proof).	12
	PUJA VACATION **(19.10.2023 to 15.11.2023)**		
November 2023	MTMGCOR03T(Real Analysis)	Infinite series. Cauchy convergence criterion for series, positive term series, geometric series, comparison test, convergence of p-series, Root test, Ratio test, alternating series, Leibnitz's test(Tests of Convergence without proof). Definition and examples of absolute and conditional convergence.	10
December 2023	MTMGCOR03T(Real Analysis)	Sequences and series of functions, Pointwise and uniform convergence. Mn-test, M-test, Statements of the results about uniform convergence and integrability and differentiability of functions, Power series and radius of convergence.	16
December 2023		**Internal Examination** **(26.12.2023 to 02.01.2024)**	
January, 2024		**Class for Slow Learners**	8
Jan-Feb, 2024		**END SEMESTER EXAMINATION**	
Total Classes			54

Name of Teacher: Dr. kusumika kundu

Paper Allotted: MTMACOR07T(Numerical Methods)

Month	Paper	Topic	No of classes
September 2023 (25.09.2023)	MTMACOR07T(Numerical Methods)	Unit-1 : Algorithms, Convergence, Errors: Relative, Absolute. Round off, Truncation. Unit-2 : Transcendental and Polynomial equations: Bisection method	8
October 2023	MTMACOR07T(Numerical Methods)	Unit-2: Newton's method, Secant method, Regulafalsi method, fixed point iteration, Newton-Raphson method. Rate of convergence of these methods. Unit-3: System of linear algebraic equations: Gaussian Elimination and Gauss Jordan methods. Gauss Jacobi method, Gauss Seidel method and their convergence analysis, LU Decomposition	12
	PUJA VACATION (19.10.2023 to 15.11.2023)		
November 2023	MTMACOR07T(Numerical Methods)	Unit-4: Interpolation: Lagrange and Newton's methods, Error bounds, Finite difference operators. Gregory forward and backward difference interpolations. Numerical differentiation: Methods based on interpolations, methods based on finite differences	10
December 2023	MTMACOR07T(Numerical Methods)	Unit – 5 : Numerical Integration: Newton Cotes formula, Trapezoidal rule, Simpson's 1/3rd rule, Simpsons 3/8th rule, Weddle's rule, Boole's rule. Midpoint rule, Composite Trapezoidal rule, Composite Simpson's 1/3rd rule, Gauss quadrature formula. The algebraic eigenvalue problem: Power method Unit – 6: Ordinary Differential Equations: The method of successive approximations, Euler's method, the modified Euler method, Runge-Kutta methods of orders two and four.	16
December 2023		Internal Examination (26.12.2023 to 02.01.2024)	
January, 2024		Class for Slow Learners	8
Jan-Feb, 2024		End Semester Examination	
		Total Classes	54

Name of Teacher: Dr. Abul Kalam Mondal

Paper Allotted: MTMACOR05T(Theory of Real Functions), MTMACOR06T(Group Theory-I)

Month	Paper	Topic	No of classes

September 2023 (25.09.2023)	MTMACOR05T	Unit-1 : Limits of functions (ε - δ approach), sequential criterion for limits, divergence criteria. Limit theorems, one sided limits. Infinite limits and limits at infinity.	6
October 2023	MTMACOR05T	Unit -1: Continuous functions, sequential criterion for continuity anddiscontinuity. Algebra of continuous functions. Continuous functions on an interval, intermediate value theorem,location of roots theorem, preservation of intervals theorem. Uniform continuity, non-uniform continuity criteria, uniform continuity theorem.	12
		PUJA VACATION (19.10.2023 to 15.11.2023)	
November 2023	MTMACOR05T	Unit -2 : Differentiability of a function at a point and in an interval, Caratheodory's theorem, algebra of differentiable functions. Unit-2: Relative extrema, interior extremum, theorem. Rolle's theorem. Mean value theorem, intermediate value property of derivatives, Darboux's theorem. Applications of mean value theorem to inequalities and approximation of polynomials. Unit -2 : Differentiability of a function at a point and in an interval, Caratheodory's theorem, algebra of differentiable functions.	12
December 2023	MTMACOR05T	Unit -2 : Differentiability of a function at a point and in an interval, Caratheodory's theorem, algebra of differentiable functions. Unit-3: Taylor's series and Maclaurin's series expansions of exponential and trigonometric functions, $\ln(1 + x)$, $1/ax+b$ and $(1 +x)n$. Application of Taylor's theorem to inequalities.	16
December 2023		**Internal Examination** (26.12.2023 to 02.01.2024)	
January, 2024		**Class for Slow Learners**	8
Jan-Feb, 2024		**End Semester Examination**	
		Total Classes	54

Month	Paper	Topic	No of classes
September 2023 (25.09.2023)	MTMACOR06T Group Theory-I	Unit-1 : Symmetries of a square, Dihedral groups, definition and examples of groups including permutation groups and quaternion groups (through matrices), elementary properties of groups.	8
October 2023	MTMACOR06T Group Theory-I	Unit-2: Subgroups and examples of subgroups, centralizer, normalizer, center of a group, product of two subgroups.	12
		PUJA VACATION (19.10.2023 to 15.11.2023)	

Month	Paper	Topic	No of classes
November 2023	MTMACOR06T Group Theory-I	Unit-3 : Properties of cyclic groups, classification of subgroups of cyclic groups, Cycle notation for permutations, properties of permutations, even and odd permutations, alternating group, properties of cosets, Lagrange's theorem and consequences including Fermat's Little theorem.	10
December 2023	MTMACOR06T Group Theory-I	Unit-4: External direct product of a finite number of groups, normal subgroups, factor groups, Cauchy's theorem for finite abelian groups. Unit-5: Group homomorphisms, properties of homomorphisms, Cayley's theorem, properties of isomorphisms, First, Second and Third isomorphism theorems.	16
December 2023		Internal Examination (26.12.2023 to 02.01.2024)	
January, 2024		Class for Slow Learners	8
Jan-Feb, 2024		End Semester Examination	
		Total Classes	54

Name of Teacher: SUMITA SAHA

Paper Allotted: MTMSSEC01M(SEC-C-Programming Language), MTMACOR07P(Numerical Methods Lab)

Month	Paper	Topic	No of classes
September 2023 (25.09.2023)	MTMSSEC01M(SEC-C-Programming Language)	Unit-1 :Defination,Requirement of programming language, Machine language,high-level programming languages,machine code of a program:compilation process,problem solving approaches:algorithm and flowchat.	8
October 2023	MTMSSEC01M(SEC-C-Programming Language)	Unit-2: Built in DataTypes:int,float,double,char;Constants and variables;first program: printf(), scanf(), compilation etc., keywords, Arithmetic operators: precedence and associativity, Assignment Statements: post and pre increment/decrement , logical operators: and, or, not.	10
		PUJA VACATION (19.10.2023 to 15.11.2023)	
November 2023	MTMSSEC01M(SEC-C-Programming Language)	Unit-3 :Relational operators, if-else statement, Iterative statements: for loop, while loop, and do-while loop; controlling loop execution: break and continue nested loop also. Unit-4: Defination and requirement of Arrays, declaration and initialization, indexing, one dimensional array: finding	12

		maximum, minimum, simple sorting and searching.	
December 2023	**MTMSSEC01M(SEC-C-Programming Language)**	**Unit-5: Introduction of Matrix Manipulations(Addition, Multiplication, Traspose), Arrays and pointers, Memory allocation and deallocation: malloc(), and free() functions. Unit-6: Introduction of Functions, Why?, How to declare, define and invoke a function, Variables' scope, local and global variables and function parameters, Pointers, arrays as function parameters, return statement, Header files and their role. Illustrate different examples like swapping values, comput n!, nCr , find max/min from a list of elements , sort a set of numbers, matrix addition/multiplication etc.**	**12**
December 2023		**Internal Examination (26.12.2023 to 02.01.2024)**	
January, 2024		**Class for Slow Learners**	**8**
Jan-Feb, 2024		**End Semester Examination**	
		Total Classes	**50**

Month	**Paper**	**Topic**	**No of classes**
September 2023 (25.09.2023)	**MTMACORO7P(Numerical Methods Lab)**	**Unit-1: Calculate the sum 1/1+1/2+1/3+1/4+…….+1/N Unit-2: Enter 100 integers into an array and sort them in an ascending and descending order.**	**8**
October 2023	**MTMACORO7P(Numerical Methods Lab)**	**Unit-3 : : Bisection Method, Newton-Raphson Method, Regula-Falsi Method , Secant Method Unit-4 : Solution of system of linear equations: LU decomposition Method, Gaussian Elimination Method, Gauss-Jacobi Method, Gauss-Seidal Method**	**10**
		PUJA VACATION (19.10.2023 to 15.11.2023)	
November 2023	**MTMACORO7P(Numerical Methods Lab)**	**Unit-5: Interpolation: Lagrange Interpolation, Newton Forward Interpolation, Newton Backward Interpolation Unit-6: Numerical Integration: Trapezoidal Rule, Simpson's one third Rule, Weddle's Rule, Gauss Quadrature.**	**8**
December 2023	**MTMACORO7P(Numerical Methods Lab)**	**Unit-7: Methodof finding Eigen value by power method Unit-8: Fitting a polynomial Function Unit-9: Solution of ordinary Differential Equations: EulerMethod**	**12**
December 2023		**Internal Examination (26.12.2023 to 02.01.2024)**	
January, 2024			**8**

	Class for Slow Learners	
Jan-Feb, 2024	**End Semester Examination**	
	Total Classes	**46**