PT. Chiranji Lal Sharma Govt. College, Karnal

LESSON PLAN

SESSION 2023-24 (01.01.2024 to 30.04.2024)

Weekly Lesson Plan (Even Semester)

PG (II / IV - Semester) : IV semester

Name of the Paper: Algebraic Number Theory **Class: M.Sc. Mathematics (SEM-IV)**

Name of the Teacher : Dr. Sheetal

WEEK	DATE	TOPICS
1	January (1-6)	
		Introduction to Algebraic numbers and algebraic integers
		some results
		Theorem based upon algebraic number and algebraic integers
		Transcendental numbers
		theorem based on transcedental numbers
		SUNDAY - 07.01.2024
2	January (8-13)	Liouville's theorem for real algebraic numbers
		Doubt class
		Thue Theorem and Roth's Theorem
		Doubt class
		Algebraic number field K
		theorem based upon algebraic number field
		SUNDAY - 14.01.2024
3	January (15-20)	Theorem of primitive elements
		corollaries and some results related to primitive elements
		Primitive m-th roots of unity
		Theorem related to mth root of unity
		problem solving
		SUNDAY - 21.01.2024
4	January (22-27)	cyclotomic poynomials
		cyclotomic polynoimal is monic., irreducible
		Liouville's Theorem for complex algebraic numbers
		Doubt class
		Minimal polynomial of an algebraic integer
		SUNDAY - 28.01.2024
5	January (29-31) February (1-3)	some prepositions
		Test
		Norm and Trace of algebraic numbers and algebraic integers
		Bilinear form on algebraic number field K
		doubts class
		SUNDAY - 04.02.2024
6	ebruary (5-10)	Integral basis and discriminant of algebraic number field
		Index of an element of K
		Ring OK of algebraic integers of an algebraic number field K
		Test
		Ideals in the ring of algebraic number field K
		Integrally closed domains
		SUNDAY - 11.02.2024

7	ebruary (12-17)	Integral basis and discriminant of algebraic number field
		Index of an element of K
		Ring OK of algebraic integers of an algebraic number field K
		Test
SUNDAY - 18.02.2024		
8	ebruary (19-24)	Ideals in the ring of algebraic number field K
		Integrally closed domains
		Fractional ideals of K
		Factorization of ideals as a product of prime ideals in ring of
		doubt class
SUNDAY - 25.02.2024		
9	ebruary (26-29) March (1-2)	algebraic integers of an algebraic number field K
		G. C. D and L. C. M of ideals in Ok
		Test
		Chinese remainder theorem
		Doubt class
		Different of an algebraic number field K
SUNDAY - 03.03.2024		
10	March (4-9)	Dedekind Theoem
		doubt class
		Euclidean Rings
		theorem related to previous topic
		revision
		Hurwitz Lemma and Hurwitz constant
SUNDAY - 10.03.2024		
11	March (11-16)	Test
		Equivalent fractional ideals
		problem solving
		doubt class
		revision
		Ideal class group
SUNDAY - 17.03.2024		
12	March (18-22)	Finiteness of the ideal class group
		class number of algebraic number field K
		Doubt class
		Diophantine equations minkowski's Bounds
		theorms based on minkowski's bounds
		Quadratic reciprocity Legendre symbols
HOLI VACATION - 23.03.2024 - 31.03.2024 (SHAHEEDI DIWAS - 23.03.2024)		
13	April (1-6)	theorems based on quadratic reciprocity
		Gauss sums
		theorem related to gauss sum
		revision
		Law of quadratic reciprocity
		Quadratic fields
SUNDAY - 07.04.2024		
14	April (8-10) April (12-13)	Theorem based on it
		Primes in special progression
		Theorem based on it
		Theorem based on it

	(12-13)	Theorem based on it	
HOLIDAY - 11.04.2024 - ID-UL-FITR			
SUNDAY - 14.04.2024			
15	**April (15-16)**	revision	
		revision	
	April (18-20)	doubts class	
		doubts class	
		doubts class	
HOLIDAY - 17.04.2024 - RAM NAVMI			
SUNDAY - 21.04.2024			
16	**April (22-27)**	test	
		problem solving	
		REVISION	
		REVISION	
		REVISION	
		REVISION	
SUNDAY - 28.04.2024			
17	**April (29-30)**	REVISION	
		REVISION	
		REVISION	
		REVISION	
University Examinations w.e.f. 01.05.2024			

Pt Chiranji Lal Sharma Govt. College Karnal

LESSON PLAN

SESSION 2023-24 (01.01.2024 to 30.04.2024)

Weekly Lesson Plan (Even Semester)

UG (IV / VI - Semester) VI semester

Name of the Paper:- REAL AND COMPLEX ANALYSIS

Name of the Teachers (Section Wise) : Dr. Sheetal

Class : BA/BSc Final

WEEK	DATE	TOPICS
1	January (1-6)	Introduction to Jacobians. Definition of Jacoban.
		Chain rule for Jacobian and some results based on Jacobians
		Examples to find jacobian of given functions
		Examples to find jacobian of given functions
		Exercise 1.1
		Exercise 1.1
SUNDAY - 07.01.2024		
2	January (8-13)	Functional dependence (or non independance)
		examples related to functional dependecy
		Exercise 1.2
		Definition of Beta function and two properties of beta function
		third property of Beta function
		Examples and Exerise 2.1
SUNDAY - 14.01.2024		
3	January (15-20)	introduction to Gamma function . recuurence formula for gamma function
		Relation between Beta and Gamma function
		Examples to find Gamma function
		Duplication formula

		legendre 's formula	
		Exercise 2.2	
SUNDAY - 21.01.2024			
4	**January (22-27)**	Introduction of Fourier Series,some important Results on	
		Fourier series for even and odd functions	
		Dirichlets conditions ,Properties of fourier coefficients and examples of Exercise 4.1	
		Exercise 4.1	
		doubt class	
SUNDAY - 28.01.2024			
5	**January (29-31) February (1-3)**	fourier expansion of functions having points of discontinuity	
		Examples of exercise4.2	
		introduction to double integral,evaluation of double integrals	
		some examples to evaluate double integral	
		substitution method for double integrals and example based on it	
SUNDAY - 04.02.2024			
6	**February (5-10)**	Explanation to triple integral with the help of some examples	
		substitution method for triple integrals and examples	
		Application of double and triple integrals for finding area and volume of surfaces with examples	
		Dirichlet's integral	
		liouvill's extension of Dirichlet's integral	
		change of order of integration with examples	
SUNDAY - 11.02.2024			
7	**February (12-17)**	calculus of complex functions introduction	
		stereographic projection of complex numbers with examples	
		complex function or functions of a complex variable , limit of a complex function	
		continuity of a complex function, uniform continuity examples	

SUNDAY - 18.02.2024			
8	**February (19-24)**	Differentiability of a complex function	
		Rule of Differentiation	
		Geometric interpretation of the derivative	
		introduction to analytic function, Cauchy-Riemann equations	
		some examples and doubt clearing session	
		sufficient condition for f(z) to be analytic,C-R equations in polar form	
SUNDAY - 25.02.2024			
9	**February (26-29) March (1-2)**	orthogonal system, introduction to Harmonic functions	
		harmonic conjugate functions.examples	
		examples	
		construction of an analytic function- Milne's Thompson's method	
		construction of an analytic function- Milne's Thompson's method	
		EXAMPLES	
SUNDAY - 03.03.2024			
10	**March (4-9)**	Applications of Analytic functions to field and flow problems	
		introduction to Multi- valued function	
		Branch,Branch cut, Branch point	
		Elementary functions- Exponential function	
		properties of exponential functions	
		examples	
SUNDAY - 10.03.2024			
11	**March (11-16)**	Trigonometrical functions sinz and cosz	
		Trigonometrical functions sinz and cosz	
		examples	
		properties of trigonometrical (Euler's theorem, De-Morvre's theorem for complex numbers)	

		Introduction to Hyperbolic functions	
		Properties of Hyperbolic functions	
SUNDAY - 17.03.2024			
12	**March (18-22)**	the logarithmic function	
		properties of the logarithmic function	
		inverse trogonometric and hyperbolic functions	
		Mapping by elementary functions and examples	
		conformal mappping,linear transformation	
HOLI VACATION - 23.03.2024 - 31.03.2024 (SHAHEEDI DIWAS - 23.03.2024)			
13	**April (1-6)**	Mobius transformation or Bilinear transformations	
		critical points	
		fixed points nature of mobius transformation	
		nature of mobius transformation	
		Problem Discussion	
SUNDAY - 07.04.2024			
14	**April (8-13)**	Problem Discussion	
		Test	
		inverse point	
		Exercise 6.2	
		Problem Discussion	
		Revision	
SUNDAY - 14.04.2024			
15	**April (15-20)**	introduction to critical mappings	
		differential transformation w= exp(z)	
		Logarithmic transfotmation w= log z	
		trogonometric transformations	
		examples	
SUNDAY - 21.04.2024			
		linear fractional transformations	

16	**April (22-27)**	examples.	
		exercise 7.1	
		exercise 7.1	
		Problem Discussion	
SUNDAY - 28.04.2024			
17	**April (29-30)**	TEST	
		Test	
		Revision	
		Revision	
University Examinations w.e.f. 01.05.2024			