Govt.P.G. College Mahendergarh
Haryana

Lesson Plan

Subject: Mathematics.
Semester: VI B.sc (N.M) Real and Complex Analysis
Subject code: 12BSM361

Section Name	Topics
Section A:	Jacobians, Beta and Gama functions.
Section A: Cont.	Double and Triple integrals, Dirichlets integrals.
Section A: Cont.	Change of order of integration in double integrals.
Section B:	Fourier's series: Fourier expansion of piecewise monotonic functions.
Section B: Cont.	Properties of Fourier Coefficients, Dirichlet's conditions, Parseval's identity for Fourier series.
Section B: Cont.	Fourier series for even and odd functions, Half range series, Change of Intervals.
Section C	Extended Complex Plane, Stereographic projection of complex numbers.
Section C: Cont.	Continuity and differentiability of complex functions, Analytic functions.
Section C : Cont.	Cauchy-Riemann equations. Harmonic functions.
Section D	Mappings by elementary functions: Translation, rotation.
Section D: Cont	Magnification and Inversion. Conformal Mappings, Mobius transformations. Fixed pints.
Section D: Cont	Cross ratio, Inverse Points and critical mappings.

Books Recommended:

1. T.M. Apostol: Mathematical Analysis, Narosa Publishing House, New Delhi, 1985
2. R.R. Goldberg : Real analysis, Oxford & IBH publishing Co., New Delhi, 1970
3. D. Somasundaram and B. Choudhary : A First Course in Mathematical, Analysis, Narosa Publishing House, New Delhi, 1997
4. Shanti Narayan : A Course of Mathematical Analysis, S. Chand & Co., New Delhi
5. R.V. Churchill & J.W. Brown: Complex Variables and Applications, 5th Edition, McGraw-Hill, New York, 1990
6. Shanti Narayan : Theory of Functions of a Complex Variable, S. Chand & Co., New Delhi.

Followed by
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Haryana

Lesson Plan

Subject: Mathematics.
Semester: IV B.sc (N.M) Sequences and Series
Subject code: 12BSM241

Week	Section Name	Topics
1	Section A:	Boundedness of the set of real numbers; least upper bound, greatest lower bound of a set, Neighborhoods.
2	Section A: Cont.	Interior points, isolated points, limit points, open sets, closed set, interior of a set, closure of a set in real numbers and their properties.
3	Section A: Cont.	Bolzano-Weiestrass theorem, Open covers, Compact sets and Heine-Borel Theorem.
4	Section B:	Sequence: Real Sequences and their convergence, Theorem on limits of sequence, Bounded and monotonic sequences.
5	Section B: Cont.	Cauchy's sequence, Cauchy general principle of convergence, Subsequences, Sub sequential limits. Infinite series: Convergence and divergence of Infinite Series.
6	Section B: Cont.	Comparison Tests of positive terms Infinite series, Cauchy's general principle of Convergence of series, Convergence and divergence of geometric series, Hyper Harmonic series or p-series.
7	Section C	Infinite series: D-Alembert's ratio test, Raabe's test, Logarithmic test.
8	Section C: Cont.	De Morgan and Bertrand's test, Cauchy's Nth root test, Gauss Test.
9	Section C : Cont.	Cauchy's integral test, Cauchy's condensation test.

10	Section D	Alternating series, Leibnitz's test, absolute and conditional convergence, Arbitrary series: Abel's lemma, Abel's test, Dirichlet's test, Insertion and removal of parenthesis.
11	Section D: Cont	Re-arrangement of terms in a series, Dirichlet's theorem, Riemann's Re-arrangement theorem.
12	Section D: Cont	Pringsheim's theorem (statement only), Multiplication of series, Cauchy product of series, (definitions and examples only) Convergence and absolute convergence of infinite products.

Books Recommended:

1. R.R. Goldberg : Real Analysis, Oxford & I.B.H. Publishing Co., New Delhi, 1970
2. S.C. Malik : Mathematical Analysis, Wiley Eastern Ltd., Allahabad.
3. Shanti Narayan : A Course in Mathematical Analysis, S.Chand and company, New Delhi
4. Murray, R. Spiegel : Theory and Problems of Advanced Calculus, Schaum Publishing co., New York
5. T.M. Apostol: Mathematical Analysis, Narosa Publishing House, New Delhi, 1985
6. Earl D. Rainville, Infinite Series, The Macmillan Co., New York

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Govt. P.G. college Mohindergarh
Lesson Plan: 2nd Semester 2024-2025
B.A/B.Sc – Algebra and Number Theory

weekly	Topics
Week 1	• Symmetric, Skew symmetric, Hermitian and skew Hermitian matrices. • Elementary Operations on matrices. • Rank of a matrices. • Inverse of a matrix. • Linear dependence and independence of rows and columns of matrices
Week 2	• Row rank and column rank of a matrix. • Eigenvalues, eigenvectors and the characteristic equation of a matrix. • Minimal polynomial of a matrix. • Cayley Hamilton theorem and its use in finding the inverse of a matrix.
Week 3	• Applications of matrices to a system of linear (both homogeneous and non–homogeneous) equations. • Theorems on consistency of a system of linear equations. • Unitary and Orthogonal Matrices • Bilinear and Quadratic forms.
Week 4	• Relations between the roots and coefficients of general polynomial equation in one variable. • Solutions of polynomial equations having conditions on roots. Common roots and multiple roots. • Transformation of equations.
Week 5	• Nature of the roots of an equation • Descarte's rule of signs. • Solutions of cubic equations (Cardon's method). • Biquadratic equations and their solutions..
Week 6	• Divisibility, G.C.D.(greatest common divisors), L.C.M.(least common multiple),Primes
Weekk 7	• Fundamental Theorem of Arithmetic. Linear Congruences, Fermat's theorem.

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