

Lesson-Plan

Class - B.Com 1st Year, 1st Sem, Subject: Business Mathematics

Teacher - Dr. Harion , Session - 2023-24 (Sem I)

July 2023	Indices
August 2023	Logarithms; Theory of sets: Meaning, type, Union, Intersection, Venn Diagram, Carte Cartesian Product, Applications of Set theory Assignment.
Sept 2023	Elementary idea of permutations and combinations, Assignment
October 2023	Sequences and Series, Arithmetic Progression, Geometric Progression, Class Test, Data Interpretation: Introduction, Tabulation, Bar graphs
November 2023	Pie charts, Line graphs, Mix Graphs.

Dr. Harion

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Lesson Plan

Uss - B.Sc 3rd Year 5th Sem, Subject: Real Analysis (Maths)
Teacher - Dr Harvorn, Session - 2023-24 (Sem I)

July 2023	Riemann Integral, Integrability of continuous and monotonic functions
August 2023	Fundamental theorem and mean value theorem of integral calculus. Improper Integrals and their convergence, Abel's & Dirichlet's test Frullan's Integral. Continuity, Differentiability, and integrability of an integral of a function of a parameter, Assignment.
Sept 2023	Metric Spaces, neighbourhoods, limit points, open set, closed set, subspaces of a metric sp Equivalent metrics, Cauchy sequences, Completeness. Baire Category theorem, Cantor's Intersection theorem, Assignment.
October 2023	Continuous functions, Uniform continuity, Bolzano-Weierstrass property, compactness, connectedness, Assign Class Test.
November 2023	Finite intersection property, components, continuity in relation with connectedness.

Dr Harvorn

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Lesson Plan

B.Sc 2nd Year, 3rd Sem

Subject: Advanced Calculus

(Maths)

Teacher - Dr. Harrom

Session: 2023-24 (Sem I)

July
2023

Continuity, Uniform Continuity, Differentiability, Mean value theorems and their geometrical interpretations.

August
2023

Taylor's and Darboux Intermediate value theorems. Indeterminate forms. Limit, Continuity, partial differentiation, Total differentials: Composite & Implicit functions, Change of variables. Homogeneous functions and Euler's theorem, Assignment.

Sept
2023

Taylor's Theorem for function of two variables. Differentiability, Schwarz's and Young's Theorem. Implicit function theorem, Maxima, Minima, Lagrange's Method of multipliers for two variables, Assignment.

October
2023

Curves: Tangents, Principal normals, Binormals, Serret Frenet formulae, Spherical Curvature. Involutives, evolutes. Bertrand Curves, Class Test.

November
2023

Surfaces: Tangent planes, one parameter family of surfaces, Envelopes.

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Lesson Plan

Class- B.Sc 1st Year, Subject: Algebra (Maths)
Teacher - Dr. Hariom, Session: 2023-24 (Sem-I)

July 2023	Types of Matrices, Elementary operations on Matrices, Rank of Matrix.
August 2023	Linear Dependence and Independence, Row rank, column rank, eigenvalues, eigenvectors, also Minimal polynomial of matrix. Cayley Hamilton theorem and its use in finding inverse of a matrix, Applications of matrices to solve system of linear equations, Assignments.
Sept 2023	Theorems on consistency of system of linear equations, Unitary and Orthogonal matrices Bilinear and Quadratic Forms, Relation between roots and coefficients of general polynomial equation in one variable, Assignment
October 2023	Solutions of polynomial equations having conditions on roots, Common roots and Multiple roots, transformation of equations, Nature of roots of an equation. Class Test.
November 2023	Descartes's Rule of signs, Solutions of cubic and biquadratic equations.

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Lesson Plan

Class - B.Sc 1st Year, 2nd Sem

Subject: Vector Calculus (Math)

Teacher - Dr. Haroon

Sessions: - 2023-24 (Sem II)

January 2024	Scalar and vector product of three vectors, product of four vectors, reciprocal vectors, vector differentiation. Scalar valued and vector valued functions, derivative along a curve, directional derivatives, gradient of a scalar point function, geometrical interpretation of gradient, Divergence and curl of a vector point functions, characters of $\text{Div } \vec{f}$ and $\text{curl } \vec{f}$ as a point function with examples.
February 2024	Gradient, divergence and curl of sums, product and their related vector identities, Laplacian operator. Orthogonal curvilinear co-ordinates, conditions for orthogonality. Gradient, divergence, curl of sums and products and their related vector identities in terms of curvilinear orthogonal curvilinear coordinate. Assignment
March 2024	Cylindrical co-ordinates and spherical co-ordinates, Vector integration, Line integral, surface integral, volume integral, Assignment.
April 2024	Theorems of Gauss, Green and Stokes and problems based on these theorems, class test and revision.
	Dr. Haroon Dr. Haroon Department of Mathematics.

Lesson Plan

B.Sc 2nd Year, 4th Sem
Teacher - Dr. Harjion

Subject: Sequences and Series (Maths)
Session: 2023-24 (Sem II)

January 2024	Boundedness of set of real numbers, least upper bound, greatest lower bound, neighbourhood, closed sets, open set, interior of set, closure of a set in real numbers, Bolzano-Weierstrass theorem, Compact set and Heine-Borel Theorem, Introduction to sequences and their convergence, results on limit, boundedness and monotonic sequences.
February 2024	Cauchy sequence, subsequences and subsequential limits. Introduction to infinite series convergence and divergence of series, Comparison test, Cauchy's general principle of convergence of series, Geometric series, Hyper Harmonic or p-series, D-Alembert's ratio test, Rat Raabe's test, Logarithmic test, de Morgan and Bertrand's test, Cauchy n th root test, Assignment
March 2024	Gauss Test, Cauchy's integral test, Cauchy's condensation test, Alternating series, Leibnitz test, absolute and conditional convergence, Arbitrary series, Abel's lemma and test, Dirichlet's test, Insertion and removal of parenthesis, re-arrangement of terms in a series, Dirichlet theorem, Reimann's Re-arrangement theorem. Assignment.
April 2024	Pringheim's theorem, multiplication of series, Cauchy product of series. Convergence and absolute convergence of infinite products.

Signature

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Lesson Plan

B.Sc 3rd Year, 6th Sem, Subject: Real and Complex Analysis (Maths)
Teacher - Dr. Harion

Session: 2023-24 (Sem II)

January
2024

Jacobians, Beta and Gamma function, Double and Triple integrals, Dirichlet's integral, change of order of integration in double integrals
Introduction to Fourier series, Fourier expansion of piecewise monotonic functions, properties of Fourier coefficients, Dirichlet's Conditions, Parseval's identity for Fourier series.

February
2024

Fourier series for even and odd functions
Half range series, change of intervals, Extended Complex Plane, Stereographic projection of complex numbers, continuity and differentiability of complex ~~numbers~~ functions, Analytic functions, Assignment.

March
2024

Cauchy-Riemann equations, Harmonic functions.
Mappings by elementary functions: Translation, Rotation, Magnification and Inversion, Conformal Mappings, Mobius transformations.

April
2024

Fixed points, Cross ratio, Inverse points and critical mappings, class test and revision.

Signature

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Lesson Plan

Class- B.Sc(II) Physics, 1st year, 2nd Sem, Subject: Mathematics II
Teacher- Dr. Hariom, Session: 2023-24 (Sem II)

January 2024	Functions of a real variable, limits, continuity and differentiability of functions, Uniform continuity on (a, b) , Intermediate value theorem, Taylor's Theorems and analytic functions. Taylor's and Maclaurin's series of elementary functions. Introduction to functions of two and three real variables.
February 2024	Continuity and differentiability of functions of two and three variables, Schwarz and Young theorem, implicit function theorem. Definition and examples of Riemann integral of a bounded function, Riemann integrability of continuous and monotonic functions, Riemann integral as limit of a sum, Assignment.
March 2024	The fundamental theorem of integral calculus, Mean value theorems, integration of rational and irrational functions, Assignment.
April 2024	Integration by partial fractions, Properties of definite integral, Reduction formulae, class test and revision.

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Lesson Plan

B.Sc(II) Physics, 2nd year, 4th Sem, Subject: Mathematics II
Teacher - Dr. Hariom, Session: 2023-24 (Sem II)

January 2024	Discrete and continuous distribution, Binomial, Poisson, geometric, normal and exponential distributions, Conditional and marginal distribution, Correlation and regression (two variables).
February 2024	Weak law of large numbers, central limit theorem for independent and identically distributed random variables, Introduction to random sample parameter and statistic, Assignment
March 2024	Concept of sampling distribution and standard error sampling distribution of mean, variance of random sample from a normal population, Assignments, Introduction to test of significance
April 2024	Test of significance based on t , f and chi-square distributions, class test and revision

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