J C Bose University of Science and Technology, YMCA Faridabad
Department of Mathematics
Lesson Plan
B. Tech. (Mechanical Engineering) (1st Semester)
MATHEMATICS-I (Calculus and Linear Algebra) (BSC-103A) 4L

Week	Theory	
I	Lecture Day	Topic
	I	Curvature and Radius of Curvature
	II	Evolutes and Involutes
	III	Evaluation of Definite and Improper Integrals
	IV	Beta and Gamma Functions
II	I	Applications of definite integrals to evaluate surface area and Volume of revolution
	II	Rolle's Theorem and its geometrical interpretation
	III	Mean Value Theorems (Lagrange's and Cauchy's)
	IV	Taylor's and Maclaurin's Theorems with Remainders
III	I	Indeterminate Forms
	II	L'Hospital's Rule
	III	Maxima and Minima for single variable functions
	IV	Functions of Several Variables: Limit and Continuity
IV	I	Related Problems on L'Hospital's Rule
	II	Differentiability and Partial Derivatives
	III	Directional Derivatives
	IV	Total Derivative

V	**I**	Tangent Plane and Normal Line
	II	Maxima, Minima, and Saddle Points (Two Variables)
	III	Maxima, Minima, and Saddle Points (Cont.)
	IV	Method of Lagrange Multipliers
VI	**I**	Method of Lagrange Multipliers (Cont.)
	II	Convergence of Sequences (Definition and Tests)
	III	Convergence of Infinite Series (Introduction)
	IV	Tests for Convergence (Comparison Test, Ratio Test)
VII	**I**	Tests for Convergence (Cauchy Root Test, Cauchy Integral Test)
	II	Tests for Convergence (Rabbe's Test, Leibnitz Test)
	III	Absolute and Conditional Convergence
	IV	Power Series and Radius of Convergence
VIII	**I**	Taylor Series for functions of a real variable
	II	Problems solved
	III	Introduction to Fourier Series
	IV	Introduction to Fourier Series (Cont.)
IX	**I**	Half Range Sine and Cosine Series , Parseval′ Theorem
	II	Introduction to Matrices: Inverse and Rank
	III	Introduction to Matrices: Inverse and Rank (Cont.)
	IV	System of Linear Equations (Consistency and Solution)

X	**I**	System of Linear Equations (Cont.)
	II	Rank-Nullity Theorem
	III	Symmetric and Skew-Symmetric Matrices
	IV	Orthogonal Matrices and their properties
XI	**I**	Orthogonal Matrices and their properties (Cont.)
	II	Determinants and their properties
	III	Properties of Eigenvalues and Eigenvectors
	IV	Properties of Eigenvalues and Eigenvectors (Cont.)
XII	**I**	Related Problems
	II	Diagonalization of Matrices
	III	Diagonalization of Matrices (Cont.)
	IV	Cayley-Hamilton Theorem
XIII	**I**	Cayley-Hamilton Theorem (Cont.)
	II	Revision of complete syllabus
	III	Doubt clearing and remedial session
	IV	Doubt clearing and conclusion

J C Bose University of Science and Technology, YMCA Faridabad
Department of Mathematics
Lesson Plan
B. Tech. (Computer Engineering) (3rd Semester)
MATHEMATICS-III (Calculus and ordinary Differential Equation)
(BSC-301) 3L

Week	**Theory**	
I	**Lecture Day**	**Topic**
	I	Introduction to Sequences & Series
	II	Convergence & Divergence of Series (Definition and Tests)
	III	Convergence of Sequences, monotonic sequences
II	**I**	Tests for Convergence (Comparison Test, Ratio Test)
	II	Tests for Convergence (Cauchy Root Test, Cauchy Integral Test)
	III	Tests for Convergence (Rabbe's Test, Leibnitz Test)
III	**I**	Absolute and Conditional Convergence
	II	Power Series and Taylor's Series
	III	Maclaurin's Series
IV	**I**	Series of Exponential & Logarithmic Functions
	II	Trigonometric Series
	III	Limit, Continuity & Partial Derivatives
V	**I**	Directional Derivatives
	II	Total Derivative & Tangent Plane
	III	Normal Line & Maxima, Minima

VI	**I**	Saddle Points
	II	Method of Lagrange Multipliers
	III	Gradient, Curl & Divergence
VII	**I**	Applications in Geometry
	II	Double Integration (Cartesian & Polar)
	III	Triple Integration
VIII	**I**	Change of Variables (Cartesian to Polar)
	II	Theorems of Green, Gauss & Stokes
	III	(cont.) Problems solved
IX	**I**	Curvilinear Coordinates
	II	Applications: Cubes & Spheres
	III	Rectangular Parallelepipeds
X	**I**	Exact, Linear & Bernoulli's Equations
	II	Euler's Equations
	III	Equations Not of First Degree
XI	**I**	Equations Solvable for p
	II	Equations Solvable for y
	III	Equations Solvable for x
XII	**I**	Clairaut's Type Equations
	II	Applications of First Order ODE

	III	Second Order Linear Equations with Variable Coefficients
XIII	**I**	Method of Variation of Parameters
	II	Cauchy-Euler Equation
	III	Power Series Solutions
XIV	**I**	Legendre Polynomials
	II	Bessel's Functions (First Kind)
	III	(cont.) Problems solved
XV	**I**	Applications of Higher Order ODE
	II	Revision of complete syllabus
	III	Doubt clearing and remedial session

J C Bose University of Science and Technology, YMCA Faridabad
Department of Mathematics
Lesson Plan
B. Tech. (Electrical Engineering) (3rd Semester)
MATHEMATICS-III (Probability and Statistics) (ELBS321) 3L

Week	Theory	
I	Lecture Day	Topic
	I	Introduction to Probability, Sample Space
	II	Axioms & Properties
	III	Conditional Probability
II	I	Conditional Probability (Cont.)
	II	Independence of Events
	III	Discrete Probability
III	I	Expectation & Variance
	II	Binomial Distribution
	III	Problems solved
IV	I	Poisson Distribution
	II	Normal Approximation
	III	Multinomial Distribution
V	I	Bernoulli Trials
	II	Correlation & Chebyshev Inequality
	III	(Cont.) problems solved
VI	I	Continuous PDF & CDF

	II	Normal Distribution
	III	Exponential & Gamma
VII	**I**	Bivariate Distributions
	II	Marginal Distributions
	III	Conditional Densities & Bayes Rule
VIII	**I**	Central Tendency Measures: Mean, Mode, Median
	II	Moments, standard deviation and variance
	III	Skewness and their problems
IX	**I**	Kurtosis and their problems
	II	Parameter Evaluation (Binomial, Poisson, Normal)
	III	Correlation & Regression
X	**I**	(Cont.) problems solved
	II	Rank Correlation
	III	Curve Fitting (Straight Line)
XI	**I**	Curve Fitting (Parabola)
	II	General Curves
	III	Hypothesis Testing (Introduction)
XII	**I**	Large Sample Proportion Test
	II	Difference of Proportions
	III	Test for Means

XIII	**I**	Diff of Standard Deviations Test
	II	t-test Single Mean
	III	t-test Difference of Means
XIV	**I**	Small Sample Correlation Test
	II	Problems solved
	III	Chi-Square Goodness of Fit
XV	**I**	Chi-Square Independence Test
	II	Revision of complete syllabus
	III	Doubt clearing and remedial session

J C Bose University of Science and Technology, YMCA Faridabad
Department of Mathematics
Lesson Plan
B. Tech. (ENC) (3rd Semester)
Mathematics-III (BS-301) 4L

Week	Theory	
I	Lecture Day	Topic
	I	Orthogonal Polynomials
	II	Orthogonal Polynomials(cont.)
	III	Chebyshev Polynomials
	IV	Chebyshev Polynomials(cont.)
II	I	Chebyshev Polynomials(cont.)
	II	Trigonometric Polynomial
	III	Trigonometric Polynomial(cont.)
	IV	Laplace Transform definition, Formulae of some elementary functions with proof
III	I	Properties of Laplace Transform with proof
	II	Properties of Laplace Transform with proof(cont.)
	III	Problems based on properties of Laplace Transform
	IV	Problems based on properties of Laplace Transform(cont.)
IV	I	Laplace Transform of Periodic function with proof
	II	Formulae of inverse Laplace Transform
	III	Evaluation of Inverse Laplace Transform with Partial Fraction method
	IV	Convolution Theorem with proof and Evaluation of inverse

		Laplace Transform by using Convolution Theorem
V	**I**	Evaluation of Integrals by Laplace Transform
	II	Solution of ODE by using Laplace Transform
	III	Solution of PDE by using Laplace Transform
	IV	Fourier Transform definition, Problems based on Fourier Transform
VI	**I**	Fourier Sine Transform definition, Problems based on Fourier Sine Transform
	II	Problems based on Fourier Sine Transform(cont.)
	III	Fourier Cosine Transform definition, Problems based on Fourier Cosine Transform
	IV	Problems based on Fourier Cosine Transform(contd.)
VII	**I**	Properties of Fourier Transform with proof
	II	Problems based on properties of Fourier Transform
	III	Finite Fourier Sine and Cosine Transform
	IV	Inverse Fourier Transform, Inverse Fourier Sine Transform and Inverse Fourier Cosine Transform
VIII	**I**	Application of Fourier Transform in solving PDE
	II	Application of Fourier Transform in solving PDE(contd.)
	III	Application of Fourier Transform in solving PDE(contd.)
	IV	Z-Transform definition and Formulae
IX	**I**	Problems based on Z transform
	II	Properties of Z transform and Questions based on properties

		of Z transform
	III	Inverse Z transform by using partial fraction method
	IV	Inverse Z transform by using inversion integral method
X	**I**	Convolution Theorem and evaluation of Inverse Z transform by using convolution method
	II	Solution of difference equations by using Z transform
	III	Vector differentiation
	IV	Gradient, Divergence and Curl
XI	**I**	Line integral and path independence, Arc parameterization
	II	Statement of Green's theorem and problems
	III	Problems based on Green's theorem(contd.)
	IV	Surface integral and problems
XII	**I**	Statement of Stoke's theorem and problems
	II	Problems based on Stoke's theorem(contd.)
	III	Volume integral and problem
	IV	Statement of Gauss Divergence Theorem and problems
XIII	**I**	Problems based on Gauss Divergence Theorem
	II	Revision of complete syllabus
	III	Doubt clearing and remedial session
	IV	Feedback and conclusion