LET'S LEARN

ENGINEERING & DIPLOMA MATHEMATICS SPECIALISTS

CONCEPT CLARITY. EXAM CONFIDENCE. CONSISTENT RESULTS.

Transforming Complex Equations into Conceptual Clarity

Structured mathematics coaching for SPPU Engineering and MSBTE Polytechnic students.

Is Mathematics Holding You Back?

- ! Fear of mathematics and weak fundamentals.
- ! Confusion in integration, derivatives and differential equations.
- ! Repeated KTs caused by gaps in concepts and exam strategy.

LEAD FACULTY

Prof. Humaafroz

M.E. (E&TC)

5+ Years Teaching Experience at a Premier Government Engineering College

WHY STUDENTS CHOOSE US

01

Exam-Centric Blueprints

SPPU/MSBTE question paper solving with practical scoring strategy.

02

Simplified Formula Shortcuts

Memorable methods that reduce lengthy calculations and revision time.

03

Small Batch Mentorship

Personal attention, doubt-solving and progress-based practice.

04

Targeted DSE Acceleration

Focused Direct Second-Year batches to bridge mathematics gaps quickly.

Degree Engineering
SPPU M-I to M-IV

Polytechnic Diploma
MSBTE M-1 to M-3

Book an Introductory Counseling Session

Discuss the right batch, syllabus coverage, KT preparation and a practical study roadmap.

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M1

SPPU DEGREE ENGINEERING

Engineering Mathematics-I

SPPU 2024 Pattern | BSC-101-BES

UNIT	MODULE	KEY TOPICS
I	**Single Variable Calculus**	Rolle's theorem, mean value theorems, Taylor and Maclaurin series, L'Hospital's rule, Fourier series and harmonic analysis.
II	**Multivariable Calculus**	Limits, continuity, partial derivatives, Euler's theorem for homogeneous functions and total derivative.
III	**Applications of Partial Differentiation**	Jacobian, errors and approximations, maxima and minima and Lagrange multipliers.
IV	**Linear Algebra: Matrices**	Rank of a matrix, systems of linear equations and linear and orthogonal transformations.
V	**Eigenvalues and Quadratic Forms**	Eigenvalues and eigenvectors, Cayley-Hamilton theorem and diagonalisation.

✓ Learning Outcomes

Calculus: Apply single and multivariable calculus techniques accurately.

Optimisation: Solve engineering maxima, minima and approximation problems.

Linear Algebra: Use matrices, eigenvalues and transformations confidently.

SPPU DEGREE ENGINEERING

M2

Engineering Mathematics-II

SPPU 2024 Pattern | BSC-151-BES

UNIT	MODULE	KEY TOPICS
I	**Integral Calculus**	Reduction formulae, beta and gamma functions, differentiation under the integral sign (DUIS) and error functions.
II	**Curve Tracing and Solid Geometry**	Cartesian, polar and parametric curve tracing, rectification, sphere, cone and cylinder.
III	**Multiple Integrals**	Double and triple integrals, change of order, area, volume, mass, centre of gravity (CG) and moment of inertia (MI).
IV	**First-Order Differential Equations**	Exact and reducible equations, linear equations and Bernoulli's equations.
V	**Applications of Differential Equations**	Orthogonal trajectories, Newton's law of cooling, electrical circuits, simple harmonic motion (SHM) and heat conduction.

✓ Learning Outcomes

Integration: Evaluate advanced, definite and multiple integrals.

Geometry: Connect calculus with curves, solids, areas and physical quantities.

Modelling: Form and solve differential equations for engineering systems.

SPPU DEGREE ENGINEERING

M3

Engineering Mathematics-III

Computer Engineering/IT Baseline Track

A focused baseline track covering transforms, statistics, probability, vector calculus and complex variables for computational branches.

UNIT	MODULE	KEY TOPICS
I	**Higher-Order Differential Equations**	Linear differential equations with constant coefficients, variation of parameters and Cauchy and Legendre equations.
II	**Fourier and Z Transforms**	Complex Fourier series, Fourier integrals, sine and cosine transforms, DFT, Z-transform and difference equations.
III	**Statistics**	Central tendency, standard deviation (SD), coefficient of variation (CV), moments, skewness, curve fitting, correlation and regression.
IV	**Probability and Distributions**	Bayes theorem, random variables, binomial, Poisson and normal distributions, chi-square tests and t-tests.
V	**Vector Calculus**	Gradient, divergence, curl, line, surface and volume integrals, Green's theorem, Gauss theorem and Stokes' theorem.
VI	**Complex Variables**	Analytic functions, Cauchy-Riemann equations, conformal mapping, Laurent series and residue theorem.

✓ Learning Outcomes

Transforms: Analyse continuous and discrete signals and systems.

Data: Apply statistics, probability and hypothesis-testing tools.

Fields: Solve vector and complex-variable engineering problems.

ADVANCED COACHING TRACK

M4 Advanced Engineering Mathematics-IV

Coaching & Reference Module

Framework Note: This module covers elective computational branches and advanced applications because SPPU does not prescribe one single universal M4 course across all engineering branches.

UNIT	MODULE	COACHING COVERAGE
I	**Numerical Algebra**	Root-finding methods, numerical error, linear systems, matrix factorisation and iterative techniques.
II	**Interpolation and Numerical Calculus**	Finite differences, interpolation, numerical differentiation and numerical integration.
III	**Numerical Differential Equations**	Euler, modified Euler, Runge-Kutta, predictor-corrector and introductory finite-difference methods.
IV	**Optimisation and Operations Research**	Linear programming, simplex concepts, transportation, assignment and constrained optimisation.
V	**Advanced Probability and Statistics**	Estimation, confidence intervals, hypothesis testing, regression, ANOVA concepts and reliability.
VI	**Mathematical Modelling and Computing**	Engineering model formulation, validation, sensitivity analysis and computational implementation.

✓ Learning Outcomes

- **Computation:** Implement dependable numerical methods.
- **Optimisation:** Model and solve engineering decision problems.
- **Application:** Validate mathematical models using computational tools.

MSBTE POLYTECHNIC DIPLOMA

M1

Basic Mathematics

MSBTE K-Scheme, Semester 1 | Course Code: 311302

UNIT	MODULE	KEY TOPICS
I	**Algebra**	Logarithms, matrices, determinants and partial fractions.
II	**Trigonometry**	Allied, compound and multiple angles, factorisation formulae and inverse trigonometric functions.
III	**Straight Line**	Slope, angle between lines, parallel and perpendicular conditions and distance formulae.
IV	**Differential Calculus**	Functions, limits, standard and composite derivatives, tangent, normal, maxima and minima.
V	**Statistics**	Range, mean, standard deviation, variance and coefficient of variation.

✓ Learning Outcomes

Foundation: Build confidence in algebra and trigonometry.

Calculus: Apply derivatives to basic technical problems.

Statistics: Summarise and compare engineering data accurately.

MSBTE POLYTECHNIC DIPLOMA

M2

Applied Mathematics

MSBTE K-Scheme, Semester 2 | Course Code: 312301

UNIT	MODULE	KEY TOPICS
I	**Indefinite Integration**	Standard integrals, substitution, partial fractions and integration by parts.
II	**Definite Integration**	Definition, properties and engineering-oriented applications of definite integrals.
III	**Differential Equations**	Order and degree, formation, variable-separable, exact and linear first-order differential equations.
IV	**Numerical Methods**	Bisection, regula-falsi, Newton-Raphson, Jacobi and Gauss-Seidel methods.
V	**Probability Distributions**	Elementary probability and binomial, Poisson and normal distributions.

✓ Learning Outcomes

Integration: Solve standard indefinite and definite integrals.

Equations: Apply differential and numerical methods confidently.

Probability: Interpret common distributions in technical contexts.

MSBTE POLYTECHNIC DIPLOMA

M3 Applied Mathematics

Legacy MSBTE G-Scheme Reference | Subject Code: 17301

Framework Note: This page serves as a baseline foundational structure for M3-level coaching and revision. Students should match it with their branch, scheme and current institute curriculum.

UNIT	MODULE	KEY TOPICS
I	**Applications of Derivatives**	Tangent and normal, maxima and minima and radius of curvature.
II	**Integral Calculus**	Standard integration, substitution, partial fractions and integration by parts.
III	**Definite Integrals and Areas**	Properties of definite integrals, area under a curve and area between curves.
IV	**First-Order Differential Equations**	Formation, variable-separable, linear, homogeneous and exact equations.
V	**Probability and Distributions**	Sample space, events, probability theorems and binomial, Poisson and normal distributions.

✓ Learning Outcomes

Derivatives: Apply optimisation and curvature concepts.

Integration: Calculate definite integrals and plane areas.

Modelling: Solve first-order equations and probability problems.