AJAY KUMAR, AP of Mathematics
Lesson Plan

Name of Teacher: AJAY KUMAR

Class: BSC/B.A. 1st Year /2nd Semester

Paper: Calculus

Session: 2025-2026

Sr.No.	Months	Weeks	Topics
1	January	2nd Week 3rd Week Last Week	1. $\epsilon - \delta$ Definitions of continuity of a function. Basic properties of limits, 2. continuous functions and classification of discontinuities. 3. Successive differentiation, Leibnitz Theorem. Maclaurin and Taylor series expansions.
2.	February	1st Week 2nd Week 3rd Week Last Week	1. Indeterminate forms, Limit and continuity of real valued functions of two variables. 2. Partial differentiation,Total Differentials 3. Composite functions & implicit functions. 4. Change of variables. Homogenous functions & Euler's theorem on homogeneous functions.
3.	March	2nd Week 3rd Week 4th Week Last Week	1. Taylor's theorem for functions of two variables 2. Differentiability of real valued functions of two variables, Implicit function theorem. 3. Maxima, Minima and saddle point variables Lagrange's method of multipliers 4. Revision of syllabus covered in first three weeks
4.	April	1st Week 2nd Week 3rd Week Last Week	1. Jacobians, Beta,Gama functions 2. Double and Triple integrals, Dirichlets integrals, change of order of integration in double integrals 3. Revisions 4.Revvision
5.	May	1st & 2ndWeek	Revision

AJAY KUMAR, AP of Mathematics
Lesson Plan

Name of Teacher:AJAY KUMAR **Class**: B.A./B.Sc. 2nd Year/4th

Semester **Paper**:Mechanics **Session**: 2025-2026

Sr.No.	Months	Weeks	Topics
1.	Jan	2nd Week 3rd Week 4th Week Last Week	1. Forces in two dimension (co-planner), triangle law and polygon law of forces, 2. Lami's theorem, resultant of concurrent and coplanar forces, conditions of equilibrium of concurrent forces. 3. Parallel forces: like parallel and unequal unlike parallel forces. 4. Resultant and centre of parallel forces 4. Revision and Test.
2.	Feb	1st Week & 2nd Week 3rd Week & Last Week	1. Friction: Definition of friction and basic laws,Problems based on equilibrium of rods and ladders; Centre of gravity: Basic concepts and definitions, centre of gravity of a uniform rod, a thin uniform lamina in the form of a parallelogram and test. 2. A thin uniform triangular lamina, three uniform rods forming a triangle, a uniform quadrilateral lamina, lamina in the form of a trapezium, centre of gravity of a body by integration
3.	March	2nd Week 3rd Week 4th Week Last Week	1. Velocity and acceleration along a plane curve, Component of velocity and acceleration in radial, transverse, tangential and normal directions, Relative velocity and acceleration. 2. Simple harmonic motion (SHM) 3.Newton's laws of motion, Central Orbits. 4. Revision of syllabus covered in 1st and 2nd week of March and Test.
4.	April	1st Week 2nd Week 3rd Week 4th & Last Week	1. Newton Laws of Motion 2. Projectile motion of a particle in a plane, velocity at any point of the trajectory. 3. Directions of projection for a particle, range and time of flight on an inclined plane. 4. Directions of projection for a given velocity and a given range; range and time of fight down an inclined plane.
5.	May	1st & 2ndWeek	Revision

AJAY KUMAR, AP of Mathematics
Lesson Plan

Name of Teacher: AJAY KUMAR
Paper: Calculus Lab

Class: BSC/B.A. 1st Year /2nd Semester
Session: 2025-2026

Sr.No.	Months	Weeks	Topics
1	January	2nd Week 3rd Week Last Week	1. To learn the basic concept of limit and limit at infinity. 2. Having the knowledge about tangent line, singular points of a curve 3. To check the symmetry of a curve about x-axis, y-axis and a line.explore
2.	February	1st Week 2nd Week 3rd Week Last Week	1. To find the asymptotes of a curve. 2. To visualise the concavity and inflexion point of a curve. 3. Gain the knowledge about the applications of calculus in optimization problems. 4. To explore the formal definition (Epsilon delta) of limit and test.
3.	March	2nd Week 3rd Week 4th Week Last Week	1. Find derivatives of algebraic, trigonometric, logarithmic, exponential functions etc. 2. To check the symmetry of a given curve. 3. Identifying the zeros, horizontal, vertical and oblique asymptotes of a given function. 4. Illustrating the regions of concave up and concave down of a curve.
4.	April	1st Week 2nd Week 3rd Week Last Week	1. To find the inflexion point of a curve. 2. To plot curves involving Cartesian and parametric coordinates. 3. To find partial derivatives of a function. 4. To find total differential of a function of two variables.
5.	May	1st & 2ndWeek	1. To find the absolute maximum and minimum value of function of one and two variables and To find maxima or minima using method of Lagrange's multipliers.

AJAY KUMAR, AP of Mathematics
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Name of Teacher: AJAY KUMAR

Class: BSC/B.A. 1st Year /2nd Semester

Paper: Mechanics Lab

Session: 2025-2026

Sr.No.	Months	Weeks	Topics
1	January	2nd Week 3rd Week Last Week	1. To learn about the Python Libraries and Modules 2. Having the knowledge about Numpy, Sympy, Matplotlib, VPython, Scipy. 3. Basic Features of VPython and Matplotlib
2.	February	1st Week 2nd Week 3rd Week Last Week	1. How to plot a curve in Matplotlib/VPython? 2. How to insert basic features of curve in Matplotlib/VPython? 3. How to insert annotation, subplots and animation in plots using Matplotlib/VPython? 4. Revision and Test
3.	March	2nd Week 3rd Week 4th Week Last Week	1. Plot a velocity time graph in Matplotlib/VPython 2. Visualizing the trajectory of a projectile in Matplotlib/VPython. 3. Revision 4. Revision
4.	April	1st Week 2nd Week 3rd Week Last Week	1. Finding the range, max height of a projectile. 2. Demonstration of Simple Harmonic motion in Matplotlib/VPython. 3. Finding the amplitude, time period of S.H.M. 4. Revision.

5.	May	1st & 2ndWeek	1. Revision

AJAY KUMAR, AP of Mathematics
Lesson Plan

Teacher: AJAY KUMAR Class: B.A. / BSc 3rd
Year/6thSemester**Paper**: Real and Complex Analysis **Session**: 2025-2026

Sr.No.	Months	Weeks	Topics
1.	Jan	2nd & 3rd Week 4th and last Week	1. Definition and examples of metric spaces, neighborhoods, limit points, interior points, open and closed sets 2. Closure and interior, boundary points, subspace of a metric space, equivalent metrics, Cauchy sequences, completeness, Cantor's intersection theorem.
2.	Feb	1st Week 2nd Week 3rd Week Last Week	1. Baire's category theorem, Contraction Principle, continuous functions, uniform continuity. 2. Compactness for metric spaces, sequential compactness, Bolzano-Weierstrass Property, total boundedness, 3. Finite intersection property, continuity in relation with compactness, connectedness. 4. Improper integrals and their convergence, comparison tests, Abel's and Dirichlet's tests
3.	March	2nd Week 3rd Week 4th & Last Week	1. Frullani's integral, Integral as a function of a parameter. Continuity, differentiability and integrability of an integral of a function of a parameter. 2.Topology of complex numbers: Trigonometric, exponential, logarithmic and hyperbolic trigonometric functions and Test. 3. Revision of syllabus covered in 1st and 2nd week of March
4.	April	1st Week 2nd Week 3rd Week Last Week	1. Finite intersection property, continuity in relation with compactness, connectedness. 2. Extended complex plane, Stereographic projection of complex numbers. 3. Continuity and differentiability of complex functions. Analytic functions, Cauchy-Riemann equations, harmonic conjugates, harmonic functions 4. Construction of analytic functions: direct method and Milne Thomson method.
5.	May	1st and 2nd Week	Revision

AJAY KUMAR, AP of Mathematics
Lesson Plan

Name of Teacher:AJAY KUMAR **Class**: B.A./BSc. 3rd Year/6th Semester
Paper: Mechanics-II **Session**: 2025-2026

Sr.No.	Months	Weeks	Topics
1.	Jan	2nd & 3rd Week 4th and last Week	1. Analytical conditions of equilibrium of co-planar forces: Equilibrium of three forces, conditions of equilibrium, trigonometric theorem's. 2. Conditions of equilibrium of co-planar forces (First, Second and Third form); Friction: Definition of friction and basic laws.
2.	Feb	1st and 2nd Week 3rd and 4th Week	1. Problems based on equilibrium of rods and ladders; Centre of gravity: Basic concepts and definitions, centre of gravity of a uniform rod, a thin uniform lamina in the form of a parallelogram and test. 2. A thin uniform triangular lamina, three uniform rods forming a triangle, a uniform quadrilateral lamina, lamina in the form of a trapezium, centre of gravity of a body by integration
3.	March	2nd Week 3rd Week 4th & Last Week	1. Motion of a particle attached to an elastic string, Hooke's law, motion of horizontal and vertical elastic strings and Test. 2. Definition of work, Power and Energy, work done by a variable force, work done in stretching an elastic string, principle of work and energy. 3. Conservative system of forces, principle of conservation of energy, impulse of a constant force and a variable force .
4.	April	1st Week 2nd Week 3rd Week 4th & Last Week	1. Motion of a particle on smooth curves, motion on the outside and inside of a smooth vertical circle 2. Projectile motion of a particle in a plane, velocity at any point of the trajectory. 3. Directions of projection for a particle, range and time of flight on an inclined plane. 4. Directions of projection for a given velocity and a given range; range and time of fight down an inclined plane.
5.	May	1st & 2nd Week	Revision

AJAY KUMAR, AP of Mathematics
Lesson Plan

Name of Teacher:AJAY KUMAR. **Class**: B.A./BSc 3rd Year/6th Semester
Paper: : Linear Algebra **Session**: 2025-2026

Sr.No.	Months	Weeks	Topics
1.	Jan	2nd and 3rd Week 4th Week and last week	1. Vector spaces, subspaces, Sum and Direct sum of subspaces, Linear span. 2. Linearly Independent and dependent subsets of a vector space. Finitely generated vector space, Existence theorem for basis of a finitely generated vector space, Finite dimensional vector spaces.
2.	Feb	1st and 2nd Week 3rd and 4th Week	1. Invariance of the number of elements of bases sets, Dimensions, Quotient space and its dimension, Homomorphism and isomorphism of vector spaces. 2. Linear transformations and linear forms on vector spaces, Vector space of all the linear transformations, Null Space, Range space of a linear transformation, Rank and Nullity Theorem, algebra of Linear Transformation.
3.	March	2nd Week 3rd Week 4th and last week	1. Minimal Polynomial of a linear transformation, Singular and non-singular linear transformations. 2. Matrix of a linear Transformation, Change of basis and Test. 3. Eigen values and Eigen vectors of linear transformations, Inner product spaces.
4.	April	1st Week 2nd Week 3rd Week Last Week	1. Cauchy-Schwarz inequality, Orthogonal vectors, Orthogonal complements, Orthogonal sets and Basis. 2. Bessel's inequality for finite dimensional vector spaces. 3. Gram Schmidt, Orthogonalization process, adjoint of a linear transformation and its properties. 4. Unitary linear transformations.
5.	May	1st and 2nd Week	Revision

AJAY KUMAR, AP of Mathematics
Lesson Plan

Name of Teacher:AJAY KUMAR

Class: B.A./BSc. 3rd Year/6th Semester

Paper: Solid Geometry

Session: 2025-2026

Sr.No.	Months	Weeks	Topics
1.	Jan	2nd and 3rd Week 4th Week and last week	1. Central Conicoids: Equation of tangent plane. 2. Director sphere and Test .
2.	Feb	1st and 2nd Week 3rd and 4th Week	1. Normal to the conicoids,Polar plane of a point. 2. Revision of syllabus covered in 1st and 2nd week of Feb and Test.
3.	March	2nd Week 3rd Week 4th and last week	1. Enveloping cone of a coincoid. 2. Enveloping cylinder of a coincoid. 3. Paraboloids: Circular section, Plane sections of conicoids.
4.	April	1st Week 2nd Week 3rd Week Last Week	1. Generating lines. 2. Confocal conicoid. 3. Reduction of second degree equations. 4. Revision.
5.	May	1st and 2nd Week	Revision