

LESSON-PLAN (Session 2025-26) Odd Semester**Name of Professor: Dr Iqbal Kaur****Subject: Mathematics****Class: MSc first semester****Paper: Mechanics of solids M24-MAT-104**

Sr. No.	Days	Topics to be covered	Remarks if any
1.	01-8-2025 to 2-8-2025	Introduction	
2.	4-8-2025 to 9-8-2025	Tensor Algebra: Coordinate transformation, Properties of tensors.	Test 1
3.	11-8-2025 to 16-8-2025	Isotropic tensors of different orders and relation between them.	Test 2
4.	18-8-2025 to 23-8-2025	Symmetric and skew symmetric tensors Tensor invariants. Deviatoric tensors. Eigen-values and eigen vector of a tensor.	Test 3
5.	25-8-2025 to 30-8-2025	Tensor Analysis: Scalar, vector, tensor functions, Comma notation, Gradient, divergence and curl of a vector / tensor field.	Test 4
6.	1-9-2025 to 6-9-2025	Analysis of Strain: Affine transformation, Infinitesimal Affine deformation. Strain tensor, Geometrical Interpretation of Strain,	Seminar
7.	8-9-2025 to 13-9-2025	Strain quadric of Cauchy. Principal strains Variants, General infinitesimal deformation. Examples of strain, Equations of compatibility	Quiz
8.	15-9-2025 to 20-9-2025	Analysis of Stress: Stress Vector, Stress tensor, Equations of equilibrium, Transformation of coordinates.	Assignment 1
9.	22-9-2025 to 27-9-2025	Stress quadric of Cauchy, Principal stresses. Maximum normal and shear stresses	Seminar
10.	29-9-2025 to 4-10-2025	Equations of Elasticity: Generalised Hooke's Law, Anisotropic Geometries, Homogeneous Isotropic media.	Seminar
11.	6-10-2025 to 11-10-2025	Elasticity moduli for Isotropic media. Equilibrium and dynamic equations for Isotropic elastic solid. Strain energy function and its connection with Hooke's Law	Debate
12.	13-10-2025 to 18-10-2025	Beltrami-Michell compatibility equations. Uniqueness of Solution. Clapeyron's theorem. Saint-Venant's principle.	Test 5
13.	20-10-2025 to 25-10-2025	Diwali Vacation	
14.	27-10-2025 to 1-11-2025	Variational Methods: Variational problems and Euler's Equation,	Assignment 2
15.	3-11-2025 to 8-11-2025	Theorem of minimum potential energy. Theorem of Minimum complementary energy.	Test 6
16.	10-11-2025 to 15-11-2025	Reciprocal theorem of Betti D Rayleigh. Ritz method: one and two dimensional cases	Test 7
17.	17-11-2025 to 22-11-2025, 24-11-2025	Galerkin method. Method of Kantorovich. Wave propagation in infinite regions. Surface waves	Test 8

LESSON-PLAN (Session 2025-26) Odd Semester**Name of Professor: Dr Iqbal Kaur****Subject: Mathematics****Class: M. Sc. First semester****Paper: Practicals M24-MAT-106**

Sr. No.	Days	Topics to be covered
1.	01-8-2025 to 2-8-2025	1. Use of nested if.. else in finding the smallest of four or more numbers. Numerical of MAT 104
2.	4-8-2025 to 9-8-2025	2. To find if a given 4-digit year is a leap year or not. 3. To compute AM, GM and HM of three given real values.
3.	11-8-2025 to 16-8-2025	4. To invert the order of digits in a given positive integral value. 5. Use series sum to compute $\sin(x)$ and $\cos(x)$ for given angle x in degrees. Then, check error in verifying $\sin^2x + \cos^2x = 1$ or other such T-identities.
4.	18-8-2025 to 23-8-2025	6. Verify $In' : \{Ir\}'$, (where $n=1, 2, \dots, m$) & check that prefix and postfix increment operator gives the same result.
5.	25-8-2025 to 30-8-2025	7. Compute simple interest and compound interest for a given amount, time period, rate of interest and period of compounding.
6.	1-9-2025 to 6-9-2025	8. Program to multiply two given matrices in a user defined function.
7.	8-9-2025 to 13-9-2025	9. Calculate standard deviation for a set of values $\{x_j\}, j : 1, 2, \dots, n$ having the corresponding frequencies $\{f_j\}, j : 1, 2, \dots, n$.
8.	15-9-2025 to 20-9-2025	10. Write the user-defined function to compute GCD of two given values and use it to compute the LCM of three given integer values.
9.	22-9-2025 to 27-9-2025	11. Compute GCD of 2 positive integer values using recursion / pointer to pointer.
10.	29-9-2025 to 4-10-2025	12. Check a given square matrix for its positive definite/ negative definite forms.
11.	6-10-2025 to 11-10-2025	13. To find the inverse of a given non-singular square matrix'
12.	13-10-2025 to 18-10-2025	14. To convert a decimal number to its binary representation and vice-versa' 15. To solve an algebraic or transcendental equation by Newton-Raphson and Regula-Falsi methods.
13.	20-10-2025 to 25-10-2025	Vacation
14.	27-10-2025 to 1-11-2025	16. To solve initial value problems by Runge-Kutta methods. 17. To solve a system of linear equations by Gauss-Seidel method'
15.	3-11-2025 to 8-11-2025	18. To solve a definite integral using Simpson rules
16.	10-11-2025 to 15-11-2025	19. Use array of pointers for alphabetic sorting of given list of English words'
17.	17-11-2025 to 22-11-2025, 24-11-2025	20. To search a number in an array by binary search method'

LESSON-PLAN (Session 2025-26) odd Semester**Name of Professor: Dr Iqbal Kaur****Subject: Mathematics****Class: M. Sc. First semester****Subject/Paper: Seminar M24-MAT-107**

Sr. No.	Days	Topics to be covered	Remarks if any
1.	01-8-2025 to 2-8-2025	Introduction	
2.	4-8-2025 to 5-8-2025	Discussion about topic of seminar	
3.	11-8-2025 to 12-8-2025	Discussion about topic of seminar	
4.	18-8-2025 to 19-8-2025	Discussion about topic of seminar	
5.	25-8-2025 to 26-8-2025	Discussion about topic of seminar	Practicals
6.	1-9-2025 to 2-9-2025	Discussion about topic of seminar	Practicals
7.	8-9-2025 to 9-9-2025	Discussion about topic of seminar	Practicals
8.	15-9-2025 to 16-9-2025	Discussion about topic of seminar	Practicals
9.	22-9-2025 to 23-9-2025	Discussion about topic of seminar	Practicals
10.	29-9-2025 to 30-9-2025	Discussion about topic of seminar	Practicals
11.	6-10-2025 to 7-10-2025	Discussion about topic of seminar	Practicals
12.	13-10-2025 to 14-10-2025	Discussion about topic of seminar	Practicals
13.	20-10-2025 to 21-10-2025	Diwali Vacations	Practicals
14.	27-10-2025 to 28-10-2025	Discussion about topic of seminar	Practicals
15.	3-11-2025 to 4-11-2025	Discussion about topic of seminar	Practicals
16.	10-11-2025 to 11-11-2025	Discussion about topic of seminar	Practicals
17.	17-11-2025 to 18-11-2025, 24-11-2025	Seminar presentation	Practicals

LESSON-PLAN (Session 2025-26) Odd Semester**Name of Professor: Dr Iqbal Kaur****Subject: Mathematics****Class: M. Sc. Third Semester****Paper: Fluid Mechanics M24-MAT-301**

Sr. No.	Days	Topics to be covered	Remarks
1.	01-8-2025 to 2-8-2025	Kinematics of fluid in motion: Real fluids and ideal fluids, Velocity at a point of a fluid.	
2.	4-8-2025 to 9-8-2025	Lagrangian and Eulerian methods. Stream lines, Path lines and Streak lines. Vorticity and Circulation,	
3.	11-8-2025 to 16-8-2025	Vortex lines, Velocity potential, Irrotational and rotational motions. Acceleration at a point of fluid, Local and particle rates of change	
4.	18-8-2025 to 23-8-2025	Equation of continuity. Reynold's Transport Theorem. Rates of change of material integrals. Analysis of local fluid motion.	
5.	25-8-2025 to 30-8-2025	Properties of fluids. Boundary Conditions, Boundary surfaces. Equation of Motion: Lagrange's and Euler's equations of Motion.	
6.	1-9-2025 to 6-9-2025	Bernoulli's equation, Applications of the Bernoulli Equation in one-dimensional flow problems,	
7.	8-9-2025 to 13-9-2025	Steady motion under conservative body forces. Kelvins circulation theorem, Vorticity equation.	
8.	15-9-2025 to 20-9-2025	Energy equation for incompressible flow. Kinetic energy of irrotational flow. Kelvins minimum energy theorem. Mean value of the velocity potential.	Assignment 1
9.	22-9-2025 to 27-9-2025	Kinetic energy of infinite liquid. Uniqueness theorems. Mean value of the velocity potential. Kinetic energy of infinite liquid. Uniqueness theorems	
10.	29-9-2025 to 4-10-2025	Axially symmetric flows. Sphere at rest in a uniform stream, Sphere in motion in fluid at rest at infinity.	
11.	6-10-2025 to 11-10-2025	Equation of motion of a sphere. Kinetic energy generated by impulsive motion. Motion of two concentric spheres.	
12.	13-10-2025 to 18-10-2025	Three-dimensional sources, sinks and doublets. Images of sources, sinks and doublets in rigid impermeable infinite plane and in impermeable spherical surfaces.	
13.	20-10-2025 to 25-10-2025	Diwali Vacations	
14.	27-10-2025 to 1-11-2025	Two-dimensional flows: Use of cylindrical polar coordinates, Stream function, Some fundamental stream functions, Axisymmetric flow,	Assignment 2
15.	3-11-2025 to 8-11-2025	Equations satisfied by Stokes's stream function in irrotational flow, Basic Stokes's stream functions, Boundary conditions satisfied by the stream function.	
16.	10-11-2025 to 15-11-2025	Irrotational plane flows: Complex potential, Image systems in plane flows..	
17.	17-11-2025 to 22-11-2025, 24-11-2025	Milne-Thomson circle theorem, Circular cylinder in uniform stream with circulation. Blasius theorem.	

LESSON-PLAN (Session 2025-26) Odd Semester**Name of Professor: Dr Iqbal Kaur****Subject: Mathematics****Class: M. Sc. Third Semester****Paper: Elasticity M24-MAT-306 DEC-1**

Sr. No	Days	Topics to be covered	Remarks if any
1.	01-8-2025 to 2-8-2025	Introduction	
2.	4-8-2025 to 9-8-2025	Extension: Extension of beams by longitudinal forces, Beam stretched by its own weight, Bending of beams by terminal couples.	
3.	11-8-2025 to 16-8-2025	Torsion: Torsion of a circular shaft, Torsion of cylindrical bars, Torsional rigidity.	
4.	18-8-2025 to 19-8-2025	Torsion and stress functions. Lines of shearing stress.	
5.	25-8-2025 to 30-8-2025	Torsion of an elliptic cylinder. Simple torsion problems, effect of grooves. Torsion of rectangular beam,	
6.	1-9-2025 to 6-9-2025	Torsion of a triangular prism. Solution of torsion problems by means of conformal mapping.	
7.	8-9-2025 to 13-9-2025	Torsion of rectangular beam, Torsion of a triangular prism. Solution of torsion problems by means of conformal mapping.	
8.	15-9-2025 to 20-9-2025	Torsion-membrane analogy, Torsion of hollow beams, Torsion of anisotropic beams.	Assignment 1
9.	22-9-2025 to 27-9-2025	Torsion of hollow beams, Torsion of anisotropic beams. Flexure of beams by terminal loads,	
10.	29-9-2025 to 4-9-2025	Flexure of circular and elliptic beams, Bending of rectangular beams, Bending of circular pipes.	
11.	6-10-2025 to 11-10-2025	Two dimensional problems: Plane deformation, Generalized plane stress, Plane elastostatic problems. Airy stress function.	
12.	13-10-2025 to 18-10-2025	General solution of biharmonic equation, Stresses and displacements in terms of complex potentials.	
13.	20-10-2025 to 25-10-2025	The structure of functions $\phi(z)$ and $\psi(z)$. First and second boundary value problems in plane elasticity. Existence and uniqueness of the solutions.	
14.	27-10-2025 to 1-11-2025	Three dimensional problems: General solutions; Concentrated forces;	Assignment 2
15.	3-11-2025 to 8-11-2025	The problem of Boussinesq. Elastic sphere: pressures, harmonics, equilibrium.	
16.	10-11-2025 to 11-11-2025	Deformation of elastic half-space by normal loads; Betti's Integration method. Vibrations of elastic solids,	
17.	17-11-2025 to 22-11-2025, 24-11-2025	Wave propagation in Infinite regions, Surface waves.	