

Department of Applied Mechanics, IIT Delhi
Second Semester, 2024-2025

Advanced Mechanics of Solids (APL 331) 3-0-0

Course Co-ordinator: Gaurav Singh (E: gsingh@am.iitd.ac.in, O: IV-255, P: 011-2659-1184)

Schedule: J slot (M/T/F 12-12.50 pm)

Venue: LH 421

Teaching Assistants: Sachin Yadav (sachin.yadav@am.iitd.ac.in) & Ayan Basu (ayan.basu@am.iitd.ac.in)

Outline:

#	Topic
1	Theory of small strain & stress
2	Linear elasticity & thermo-elasticity
3	Problem formulation (stress and displacement), Boundary conditions, Principle of superposition, Saint-Venant's principle
4	Strain energy, Uniqueness of elasticity BVP, Principle of virtual work, Rayleigh-Ritz method
5	Plane strain and stress, Airy stress function
6	Polar co-ordinates – theory and applications
7	Anisotropic elasticity
8	Viscoelastic, plastic and visco-plastic constitutive relations

Textbook: Sadd M. H., Elasticity : Theory, Applications, and Numerics, Academic Press.

Evaluation:

Mid-sem (2 hour)	:	30%
Quizes	:	25%
End-sem (2 hour)	:	45%

Note:

- All evaluative components of the course are closed book in nature. Important formulae and equations will be provided.
- There will be no make-up for quizzes under any circumstances.
- Institute norms will be used for anything which is not specifically mentioned in this outline.