

Department of Applied Mechanics, IIT Delhi
First Semester, 2020-2021

Solid Mechanics (APL 104) 3-1-0

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

Teaching Assistants: Sunil Kumar Dutta, Ashish Singh & Sailendu Biswal

UG Teaching Assistant: Shubham Rustagi

Lecture Schedule: T W F 9-9.50a

Tutorial Schedule: T Th F 2-2.50p

Textbook:

Crandall, Dahl, Lardner & Sivakumar: An Introduction to Mechanics of Solids (in SI Units), 3e, McGraw Hill.

Outline:

#	Topic	Section Number from Textbook
a	Revision of concepts from Engineering Mechanics (APL 100)	1.1-1.11, 2.1-2.7, 3.1-3.8
b	State of stress at a point, equations of motion, principal stress, maximum shear stress, plane stress, transformation of stress tensor	4.1-4.7
c	Concept of strain, strain displacement relations, compatibility conditions, principal strains, plane strain, transformation of strain tensor	4.8-4.15
d	Constitutive relations, uniaxial tension test, idealized stress-strain diagrams, isotropic linear elastic, viscoelastic and elasto-plastic materials, thermal stresses	5.1-5.8
e	Torsion	6.1-6.8
f	Bending and shear stresses in beams	7.1-7.8
g	Deflection of beams, Energy methods	8.1-8.6
h	Stability of equilibrium configuration	9.1-9.4

Evaluation:

All components will be open book (only access to hand-written lecture notes is allowed; not textbook, recordings or internet):

Quiz (3)	:	35%
Minor	:	25%
Major	:	40%

Note:

- Minimum of 30% marks is required for pass grade
- Announcements will be made through MS Teams/Moodle