

Department of Applied Mechanics, IIT Delhi
First Semester, 2026-2027

Fracture Mechanics (APL 765/AML7260) 3-0-0

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

Class Schedule: X slot

Venue: IV LT4

Teaching Assistant: Ayan Basu (ayan.basu@am.iitd.ac.in)

Module 1 (lectures):

#	Topic
1	Energy Release Rate G
2	Stress Intensity Factor K
3	Crack Opening Displacement δ
4	J -Integral
5	Mixed-mode crack growth

Hard copy of lecture notes will be distributed to all registered students.

Module 2 (presentations):

Each student will be presenting research article of their own academic interest. These research articles will become part of the course content.

Evaluation:

Mid-sem (2 hour)	:	25%
Quizes	:	10%
Presentations	:	30%
End-sem (2 hour)	:	35%

Note:

- The mid-sem and end-sem exams will be open book. The (clean) lecture notes and (clean) research articles will only be allowed. Hand written notes will not be allowed.
- Institute rules apply for any aspect of the course which is not specifically mentioned here.
- An excellent prior knowledge of Linear Elasticity is **essential** for doing this course. Lectures on Linear Elasticity can be accessed at [this link](#) – the required topics can be seen below.

Pre-requisite topics from Linear Elasticity

#	Topic
a	Theory of small strain & stress
b	Linear elasticity & thermo-elasticity
c	Problem formulation (stress and displacement), Boundary conditions, Principle of superposition, Saint-Venant's principle
d	Strain energy, Uniqueness of elasticity BVP, Principle of virtual work, Rayleigh-Ritz method
e	Plane strain and stress, Airy stress function
f	Polar co-ordinates – Contact & Fracture Mechanics applications