Continuum Damage Mechanics - Web course

COURSE OUTLINE

Continuum Damage Mechanics(CDM)nis a newly emerging area of Solid Mechanics.

While the Continuum Mechanics deals with an ideal continuum on one hand where as Fracture Mechanics requires an existing crack ot macroscopic scale.

The Deterioration of the material before the manifestation of a macroscopic crack can be explained through the concept of Continuum Damage Mechanics.

The main purpose of the course is to provide a basic introduction of CDM to the post-graduate students .

COURSE DETAIL

Sl.No.	Topics	No. of Hours
1	**General Introduction:** • Phenomenological Aspects of Continuum Damage. • Physical Manifestations of Damage. • Mechanical Representation of Damage. • Measurement of Damage. • Scope of Continuum Damage Mechanics(CDM).	06
2	**Review of essential Solid Mechanics concepts**.	04
3	**Indicial Notations and Tensors**. **Constitutive Equations in Tensorial Notation**.	04
4	**Review of Plasticity Concepts**.	06
5	**Thermodynamics & Micromechanics of Damage**.	05
6	**Kinetic Laws of Damage Evolution**.	05
7	**Nonlinear FEM Re-visited**.	05

NP-TEL

NPTEL

http://nptel.iitm.ac.in

Civil Engineering

Pre-requisites:

1. Solid-Mechanics/Elasticity.
2. Plasticity.
3. FEM (Linear/Nonlinear).
4. Fracture Mechanics(Desirable).

Additional Reading:

1. International Journal of Damage Mechanics.

Coordinators:

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8	**Analysis of Structures considering Damage**.	**05**

References:

1. A Course on Damage Mechanics, By Jean Lemaitre, Springer-Verlag(1991).