TEACHING LEARNING MATERIAL

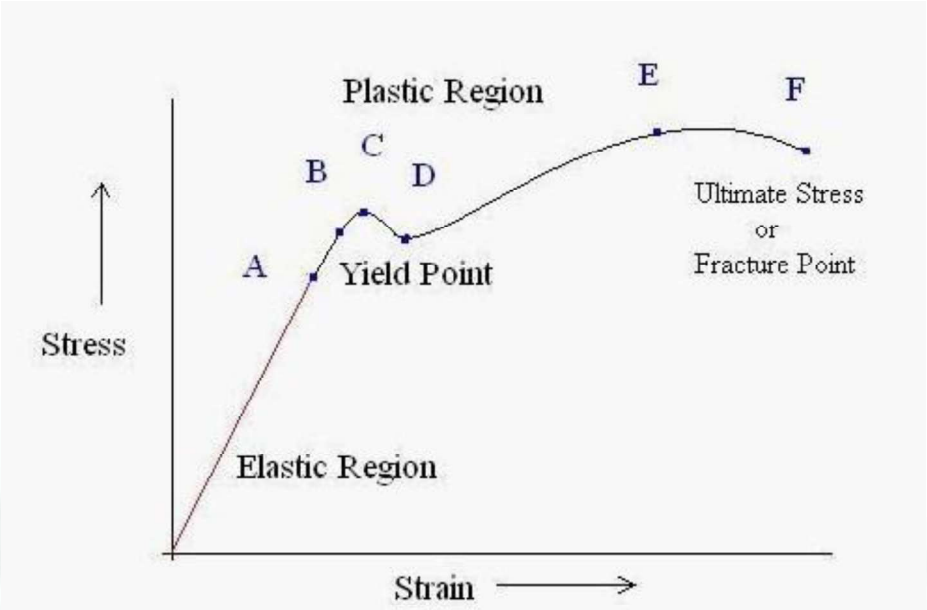
GANDHI SCHOOL OF ENGINEERING, BHABANDHA

BRANCH- CIVIL ENGINEERING

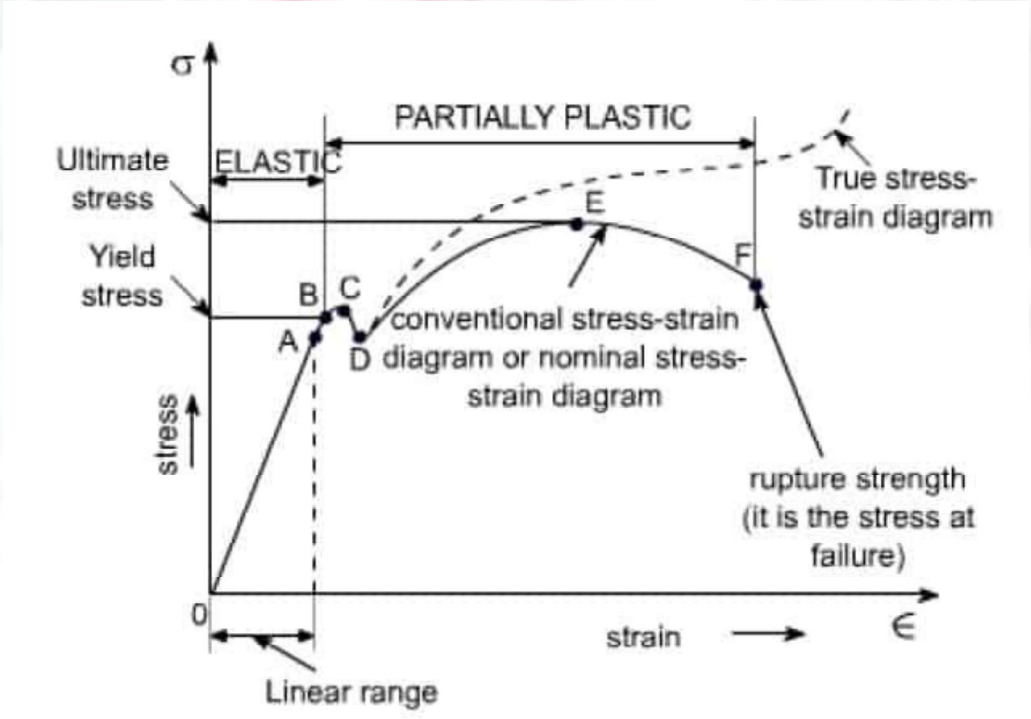
SUBJECT-STRUCTURAL

MECHANICS

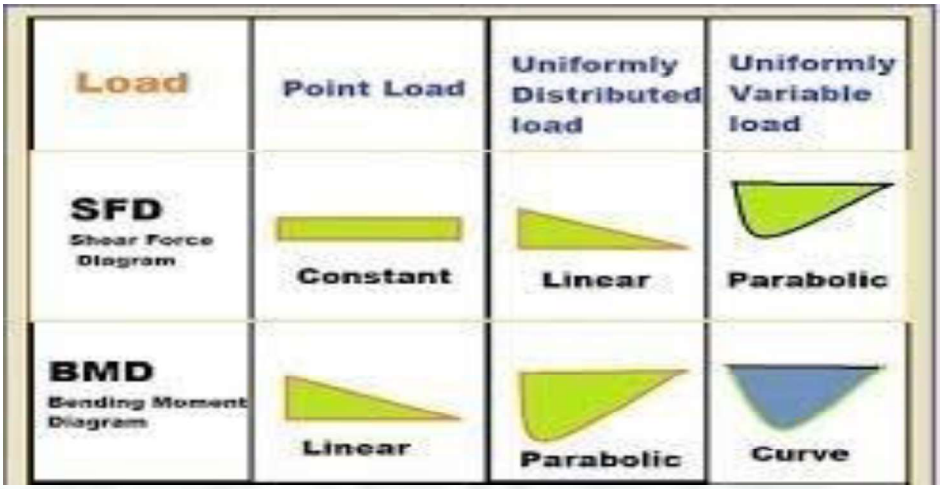
PREPARED BY-Er. SRIDHAR SAHU



Stress – Strain diagram for ductile material

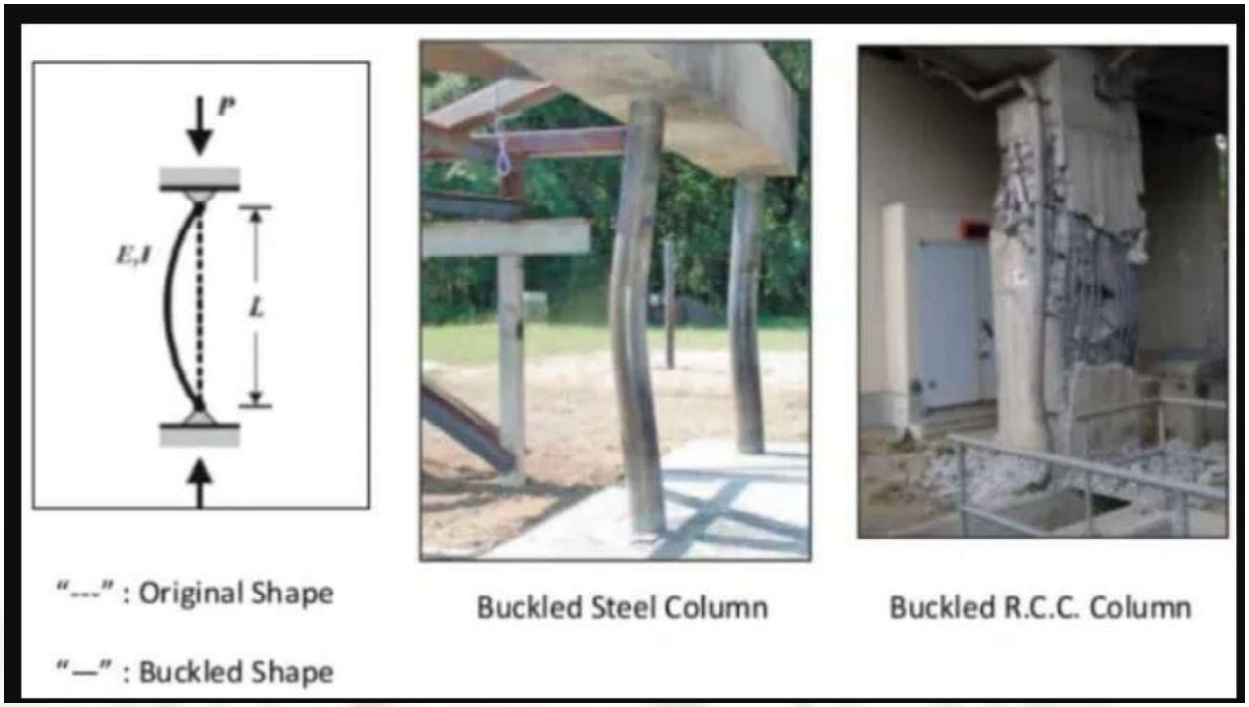


Stress – Strain diagram for ductile material with different stage

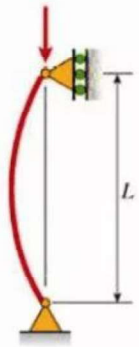
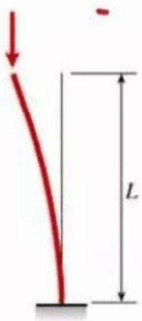
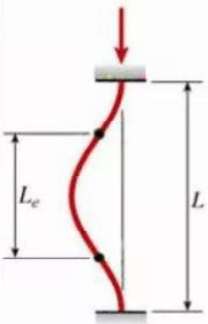
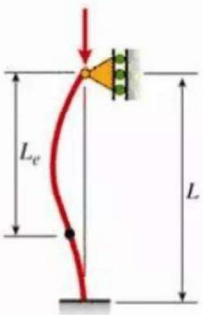


Different shape for shear force and bending moment diagram

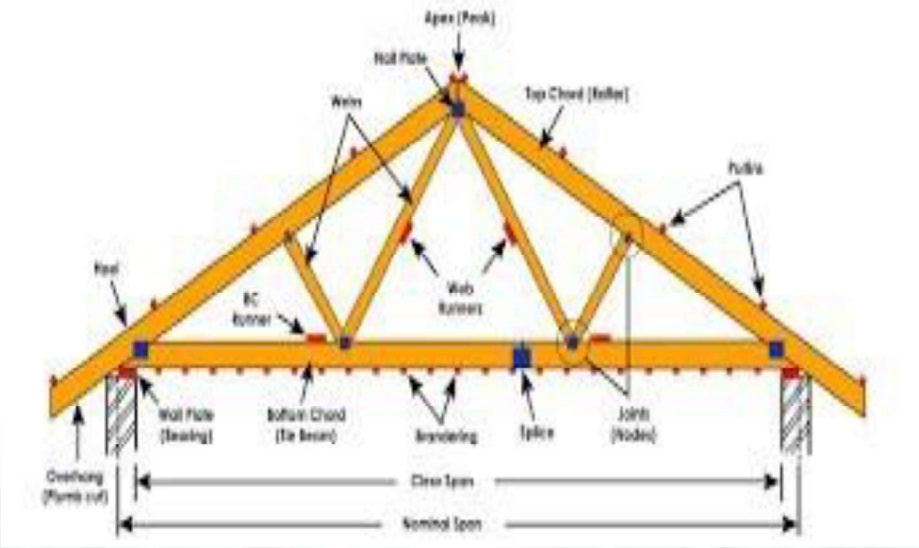
Due to external load bending stress with compression and tension zone and also neutral axis of the beam



Buckling shape of the column

(a) Pinned-pinned column	(b) Fixed-free column	(c) Fixed-fixed column	(d) Fixed-pinned column
$P_{cr} = \frac{\pi^2 EI}{L^2}$	$P_{cr} = \frac{\pi^2 EI}{4L^2}$	$P_{cr} = \frac{4\pi^2 EI}{L^2}$	$P_{cr} = \frac{2.046\ \pi^2 EI}{L^2}$
			
$L_e = L$	$L_e = 2L$	$L_e = 0.5L$	$L_e = 0.699L$
$K = 1$	$K = 2$	$K = 0.5$	$K = 0.699$

Different end condition of the column


Apex (Peak)
Ridge Purlin
Top Chord (Rafter)
Purlins
Web Runners
Wall Plate (Bearing)
Splice
Joints (Nodes)
Clear Span
Nominal Span

Truss