



ADITYA ENGINEERING COLLEGE (A)

Aditya Nagar, ADB Road, Surampalem

Department of Civil Engineering

Name of the Faculty: Mr. P. Ravi Kishore

Course Name: Strength of materials - I

Conventional method: Chalk and talk

Innovative teaching method: Brainstorming sessions

About the topic:

In the mechanics of materials, the strength of a material is its ability to withstand an applied load without failure or plastic deformation. The field of strength of materials deals with forces and deformations that result from their acting on a material. A load applied to a mechanical member will induce internal forces within the member called stresses when those forces are expressed on a unit basis. The stresses acting on the material cause deformation of the material in various manners including breaking them completely. Deformation of the material is called strain when those deformations too are placed on a unit basis.

The stresses and strains that develop within a mechanical member must be calculated in order to assess the load capacity of that member. This requires a complete description of the geometry of the member, its constraints, the loads applied to the member and the properties of the material of which the member is composed. The applied loads may be axial (tensile or compressive), or rotational (strength shear). With a complete description of the loading and the geometry of the member, the state of stress and state of strain at any point within the member can be calculated. Once the state of stress and strain within the member is known, the strength (load carrying capacity) of that member, its deformations (stiffness qualities), and its stability (ability to maintain its original configuration) can be calculated.

The calculated stresses may then be compared to some measure of the strength of the member such as its material yield or ultimate strength. The calculated deflection of the member may be compared to deflection criteria that are based on the member's use. The calculated buckling load of the member may be compared to the applied load. The calculated stiffness and mass distribution of the member may be used to calculate the member's dynamic response and then compared to the acoustic environment in which it will be used.

Material strength refers to the point on the engineering stress–strain curve (yield stress) beyond which the material experiences deformations that will not be completely reversed upon removal of the loading and as a result, the member will have a permanent deflection. The ultimate strength of the material refers to the maximum value of stress reached. The fracture strength is the stress value at fracture (the last stress value recorded).

Adopting innovative TL method:

Subjects which are the continuous from the previous semester needs a small revision before entering into actual lectures. Mr. Ravi Kishore P, who handled Strength of materials I, used brainstorming session during the early stages of the semester which helped the students to revise the previous semester courses that would be helpful for the upcoming extended course. Each and every student is asked to explain the concepts that they known from the previous subjects, irrespective of its accuracy, were noted and organized in the board. This actually helped the students to revise all the concepts and based upon which further courses are explained with ease.