School of Engineering & Built Environment

MEng/BEng(Hons) in:
Mechanical-Electronic Systems Engineering
Mechanical & Power Plant Systems
Electrical Power Engineering
Computer-Aided Mechanical Engineering

Module: Engineering Design & Analysis 2
(Module No. M2H721926)

Combined Bending and Direct Stress:
A Summary

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GLASGOW CALEDONIAN UNIVERSITY

SCHOOL OF ENGINEERING & BUILT ENVIRONMENT

ENGINEERING DESIGN & ANALYSIS 2 (M2H721926): Combined Bending and Direct Stress

Principle of Superposition

The stress at any point of a structure, beam or strut carrying several loads may be found by considering each load separately *as if it acted alone*. The total stress is then the algebraic sum of the stresses due to each separate load. This is the *method of superposition*.

Direst Stress, $\sigma_d = \frac{P}{A}(N/m^2)$ [Note: +ve for tensile load, -ve for compression load]

Bending Stress, $\sigma_b = \pm\frac{My}{I}$ (N/m^2) [Note: +ve for tensile load, -ve for compression load]

Combined Stresses: $\sigma = \sigma_d \pm \sigma_b$