

Vibration Analysis of Functionally Graded Engesser-Timoshenko Beams Subjected to Axial Load Located on a Continuous Elastic Foundation

Authors : M. Karami Khorramabadi, A. R. Nezamabadi

Abstract : This paper studies free vibration of functionally graded beams Subjected to Axial Load that is simply supported at both ends lies on a continuous elastic foundation. The displacement field of beam is assumed based on Engesser-Timoshenko beam theory. The Young's modulus of beam is assumed to be graded continuously across the beam thickness. Applying the Hamilton's principle, the governing equation is established. Resulting equation is solved using the Euler's Equation. The effects of the constituent volume fractions and foundation coefficient on the vibration frequency are presented. To investigate the accuracy of the present analysis, a comparison study is carried out with a known data.

Keywords : functionally graded beam, free vibration, elastic foundation, Engesser-Timoshenko beam theory

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