The dynamic instability of truncated conical shells subjected to dynamic axial load within first order shear deformation theory (FSDT) is examined. The conical shell is made from functionally graded (FG) orthotropic material. In the formulation of problem a dynamic version of Donnell's shell theory is used. The equations are converted to a Mathieu-Hill type differential equation employing Galerkin's method. The boundaries of main instability zones are found applying the method proposed by Bolotin. To verify these results, the results of other studies in the literature were compared. The influences of material gradient, orthotropy, as well as changing the geometric dimensions on the borders of the main areas of the instability are investigated.