This paper investigates the parametric instability (PI) of multilayered composite conical shells (MLCCSs) under axial load periodically varying the time, using the first order shear deformation theory (FOSDT). The basic equations for the MLCCSs are derived and then the Galerkin method is used to obtain the ordinary differential equation of the motion. The equation of motion converted to the Mathieu-Hill type differential equation, in which the DI is examined employing the Bolotin's method. The expressions for left and right limits of dimensionless parametric instability regions (PIRs) of MLCCSs based on the FOSDT are obtained. Finally, the influence of various parameters; lay-up, shear deformations (SDs), aspect ratio, as well as loading factors on the borders of the PIRs are examined.