To minimize the structural weight, composite materials have been increasingly used in various types of engineering systems such as aeronautics, aerospace, mechanics and civil engineering. Due to its high level of energy dissipation, the viscoelastic layer is provided to play a damping role and improves the dynamic response of the structure. Viscoelastic laminated plates consist of a soft viscoelastic layer which is confined between two identical elastic and stiff layers. Depending on the material attenuation, guided waves are able to propagate over relative long distances, interact sensitively with and/or being related to different types of defects like e.g. delamination, corrosion damage, etc. In this study a first order shear deformation theory is used to describe the deformation of the composite plate. Simplified forms of these equations for symmetric laminated plate are then derived. The hysteric model of viscoelasticity is used for the mid layer of the composite plate. Results from the present theory are then compared with the results from the Mindlin’s Plate Theory for validation of the model. Further FE analysis is done for the validation of the theoretical model in COMOSL Multiphysics. The results from both the FE model and the theoretical model agree with each other.