In the present study, a numerical model for wheel-snow interaction is presented using finite element method. For this aim, the model of tire is designed using SolidWorks and ANSYS Design modeler. The analyses of the prepared models are performed using ANSYS Explicit Dynamics considering Mooney-Rivlin tire model. Frictional relationship between wheel and snow ground was established and snow erosion is considered as linear, in the analyses. To validate the results, a comparison is carried out with available results. Six different mesh sizes are considered in the study, the effect of mesh sizing and mesh number on the accuracy of the obtained results and solution time is discussed. Finally, it is concluded that models with 0.025 m and 0.02 m mesh sizes give more accurate results than the others and a strong linear proportion exists between the number of iteration and the mesh size.