For composite systems with a coarse decomposition it is usually more difficult to find a suitable Lyapunov function for the sub-systems that may no longer be of low order, and provides computational and analytical difficulties. In this paper, we present a constructive methodology of Lyapunov function in the case of coarse decomposition to analyze stability of the origin for a general class of nonlinear composite systems expressed in state variables as n first-order nonlinear differential equations. We need to find a storage function to be used as Lyapunov function. A family of this design can be constructed by recursive procedure of a different version of the same basic step: the augmentation by one equation at each step. The present results make use of graph-theoretic decomposition techniques in which the composite systems lead to a sequence of coarser subsystems. Finally, an example is given to illustrate the constructive methodology proposed