In physics and biology, many phenomena can be described by differential equations. Typically, these continuous models cannot be solved analytically, therefore, by using some numerical method, we construct discrete models. These models should reflect the physically/biologically motivated basic qualitative properties of the original phenomena. Our aim is the analysis of these properties for different discrete models. In our talk, we will consider discrete models of different processes, namely, the ehat equation process and the time-space-depending epidemic propagation (SIS, SIR models). We give conditions for the discretization parameters in the discrete models under which the models possess the main characteristic properties. We illustrate our results with numerical examples.