

## Abstract

This thesis deals with semilinear delay evolution equations with nonlinear constraints. To find an integral solution to this problem, semilinear delay evolution equation with nonlinear constraints is converted into the abstract functional differential equation with non-densely defined generators and solved as an inhomogeneous Cauchy problem. Since non-densely defined generators are used, we can use *integrated semigroup approach to solve this problem. Age structured proliferating cell population with inherited cycle length including delay terms is modelled as a semilinear delay evolution equation with nonlinear constraints and obtained an integral solution for this model by using the above method.*