Abstract

This thesis concerns the asymptotic distribution of eigenvalues on a quantum graph with certain vertex conditions. The operator of consideration is known as the Hamiltonian which acts as the negative second-order differential operator on the functions defined on the edges of a compact metric graph along with some appropriate vertex conditions. We will derive the asymptotic formula for the eigenvalue counting function of the Hamiltonian acting on the graph in two separate cases. Moreover, the thesis include a close study of the sesquilinear form corresponding to the Hamiltonian as well as an introduction to a few selected topics from the theory of Hilbert spaces.