



INTRODUCTION

In this thesis we extend the basic theorems of topological vector spaces which are proven in the case of real or complex scalars to the quaternionic case. The quaternions are a non-commutative division ring.

In Chapter I, we study the algebra and analysis of the quaternions, vector spaces over the quaternions and we also give the point set topology which will be used in this thesis.

In Chapter II, we study the basic properties of paranormed and seminormed spaces over the quaternions.

In Chapter III, we study some important properties of topological vector spaces over the quaternions. We study completeness, quotients, finite-dimensional spaces, totally bounded (or precompact) sets and compact sets which are five important topics involving topological vector spaces over the quaternions.

In Chapter IV, we study Frechet space over the quaternions, the open mapping theorem and closed graph theorem.

In Chapter V, we study the concept of a locally convex space over the quaternions and its important properties.