The potential of optical fibers in communication technology has been widely recognized. Study of different optical waveguides is a subject area which is expanding rapidly to take advantages of the optical communication. Needless to say that optical fiber has been developed to such a degree that it can now be seen as an important and perhaps the integral part of modern telecommunication systems. It has come to generally accept that during the last four decades of the 20th Century optical fiber communication technique will firmly be established in the world. Research in optical waveguide began in the early 1960s and has since then continued with increased vigor and diversification. Optical fibers are found useful as a transmission medium for a broad range of applications from telecommunication to other field of science and technology. Optical fibers for light wave communications have been very successfully installed for different applications throughout the world. Fiber optic transmission challenges the satellite links, radio links and all kinds of wire links. In the mean time, integrated optics will have to prove that the photon, basic unit of light, can replace the electron. The motivation of the present author aroused some year ago by new developments and the pursued a study of some of these conventional structures in the context of the waveguide theory.

As the structure discussed here is new, it was not possible to get any experimental or theoretical results from the existing literature. However, whenever possible, an attempt has been made to compare and correlate results derived here for different waveguides. In writing this
thesis, I have attempted to give a brief idea of optical fiber regime along with my original research work that has published in different journals of international repute.

The investigator was engaged in making the complicated and sometimes-tedious theoretical analysis and numerical computation, his enthusiasm was sustained by the hope that the investigation would yield significant, verifiable and technically useful information. If this work is regarded as a small contribution in the important and useful field of waveguide research, the author will feel amply rewards for his endeavor.