The work in the thesis presents the design and analysis of monopole antennas for wireless communication and it covers various wireless applications. The wireless industry is witnessing a volatile emergence today in present era. Today’s antenna systems demand versatility and unobtrusiveness. The accelerating progress of the wireless communication and the ever increasing number of communication services such as cellular phones, Global Positioning System (GPS), Wibro and ISM in the last few years has created an ever growing demand for multisystem applications.

Communication systems need a wide frequency bandwidth to transmit and receive multimedia information at high data rates. Mobile wireless communication products must be easily portable and cheap to make them attractive to modern people. Suddenly it seems everything from mobile phone to MP3 players, printers to GPS receivers, instruments in hospitals, pathology laboratories, even the chemistry and physics labs has the ‘Blue-tooth’ built-in for wireless operation ‘cutting the usual wired chords’. There is precisely a need for compact antennas in these gadgets especially driven by fast changing mobile communication technology, that too in large volume of demand at affordable cost. This needs thinking twice or more before allocating a spectrum for a specific service as this amount to huge investments in research, development, technology implementation and service operation. So, the antennas like monopole antennas is one of the best solution and hence the study is made and is presented in this thesis.

The various designs of Printed Rectangular Monopole Antenna for UWB operation has been explained and these antennas have compact size of 16 mm X 26 mm compared to the antennas available in the literature survey. All these antennas are satisfying FCC’s UWB requirements and few antennas are resonating above the FCC’s range. All the proposed antennas
discussed, exhibits bidirectional radiation pattern in E-plane and nearly omnidirectional radiation pattern in H-plane. They are giving good gain and almost uniform throughout the UWB band. So, we have achieved Ultrawideband operation with compact antenna having simple configurations and also satisfy the characteristics of UWB systems.

In this thesis the chapter 1 discusses introduction, compact antennas, various wireless communication bands, microstrip antenna and its theory, feeding techniques, advantages and limitations and applications. Also this chapter discusses about applications of monopole antenna in wireless communication, origin of broadband planar and printed monopole antenna and its characteristics, Planar printed UWB monopole antenna, band notched UWB monopole antenna and applications of these antennas.

An elaborate review of literature on past work carried out in the field of monopole antennas and their applications in wireless communication system is explained in chapter 2.

The chapter 3 describes the methodology, experimental and radiation pattern measurement setup. It also explains the block diagram of Vector Network Analyzer. The brief note on the simulation software IE3D version 14.6 used for simulation of monopole antennas is also explained.

The Chapter 4 discusses design considerations used for broadband planar and printed monopole antennas. The design of various configurations with different slots are discussed in detail along with the simulated and experimental results.

The Chapter 5 discusses the design of planar printed UWB monopole antennas with various configurations. The simulated and experimental
results of all the configurations for these UWB monopole antennas are discussed and presented in the form of graphs and tables.

In Chapter 6, the design and results of band notched UWB monopole antennas and their performances are presented.

The conclusions drawn from this study are presented in Chapter 7. This also includes the futuristic scope for further studies.

The references, list of publications of the author are given at the end of this thesis.