4. RESEARCH METHODOLOGY AND APPROACH

The designed antennas will be analyzed using the commercially available software IE3D. The software is based on the “method of moment”. The "method of moments" starts from deriving the currents on each segment, or the strength of each moment, by using a coupling Green's function. This Green's function incorporates electrostatic coupling between the moments for if the spatial change of the currents is known accurately then one can compute the build up of charges at points on the structure. It is usual to approximate antennas having area by wire grid approximations, which also have to be chosen extremely carefully. As one always is presented with a computed result for a simulation, even if the model is in error, one can see that replacement of areas of metal by wire grids requires physical insight into the processes involved, rather than blind application of an algorithm.

The micro strip patch antennas will be optimized for the desired characteristics like wide band, VSWR, return loss, efficiency, gain etc. The developed antennas will be fabricated on low cost substrate FR4 (glass epoxy). The antennas will be fabricated using the standard photolithography and etching techniques. The developed antennas will be tested for its various characteristics.

WORK PLAN: The study can be divided into three main parts. First part of the study includes the theoretical study and discussions of the relevant field. Second part includes the work on IE3D software of Zeland Inc. This software will be used to find various radiation characteristics of the microstrip patch antenna like VSWR, input impedance, return loss, smith chart, directivity, antenna gain, radiating efficiency and radiation pattern etc., and third part of the study includes the fabrication of microstrip patch antenna which will be fabricated on low cost substrate FR4 (glass epoxy). The comparative study of simulation results and the fabrication results will be analysed.

Till now the theoretical study and discussions of the relevant field have been taken place by reading so many standard books, internet sites and referred journals.

Next, the theoretical study and discussions should be implemented in simulation software, means some very good result should be achieved within two month from now.
Finally, fabrication of microstrip patch antenna will start for the same design for which simulation result will been achieved. The result of fabricated antennas will be carried out using vector network analyzer and will be compared with the simulated results using IE3D software.