CHAPTER-3

OBJECTIVES AND SCOPE

The present work has to be investigated with the following objectives and scope:

1) To study the various welding parameters on the welding quality of PC GTAW of 90/10 & 70/30 Cu-Ni alloy welds.

2) To study LBW on mechanical properties of 90/10 & 70/30 Cu-Ni alloy welds.

3) To study the mechanical properties of 90/10 & 70/30 Cu-Ni alloy welds by using CC GTAW and PC GTAW with same filler wire ERCu-Ni (70/30).

4) To Identify the PC GTAW process parameters such as Peak Current (PC), Base Current (BC), Pulse frequency (PF) & Welding speed (WS) and considering four levels from each welding parameter.

5) To optimise the selected PC GTAW process parameters & levels for predicting the ultimate tensile strength (UTS) at 95% confidence level by Taguchi’s method.

6) To confirm the predicted ultimate tensile strength values obtained from Taguchi method with that of the experimental values of PC GTAW joints by Analysis of variance (ANOVA).

7) To observe the influence of PC GTAW process parameters on mechanical properties and microstructures of 90/10 and 70/30 Cu-Ni alloy welds.

8) In addition to the above, To study the LASER Beam Welding (LBW) at various welding speeds on 90/10 and 70/30 Cu-Ni alloy welds for further improvement in mechanical properties (tensile strength and hardness) of the weld joints.

9) Finally, to study the pitting and corrosion resistance for CC GTAW, PC GTAW, & LBW of 90/10 & 70/30 Cu-Ni welds.
In order to accomplish the above objectives, a detailed experimental program was developed, as shown in Fig. 3.1. The overall aim of the work is to comprehensively assess the improvement in mechanical properties, microstructures & pitting corrosion of 90/10 & 70/30 Cupronickel (Cu-Ni) alloy welds by PC GTAW and LBW.

Fig: 3.1   Experimental flow chart