CHAPTER 3

THESIS OBJECTIVES

3.1 INTRODUCTION

The literature survey reveals that considerable research work has been carried out in the area of metal matrix composites. Aluminium matrix composites have an advantage among MMCs, as aluminium is of light weight, high strength and easy to fabricate. Extensive studies have been done on SiCp reinforced and Graphite particle reinforced MMCs individually, but limited work is done on incorporating both SiCp and Graphite reinforcement (hybrid composites). In the present investigation, wear behaviour, heat treatment, hardness, microstructure and electric discharge machining characteristics of hybrid metal matrix composites have been investigated.

3.2 THESIS OBJECTIVES

Based on the literature review of the research work, the objectives of the present research work are:

To -

- fabricate hybrid Al 6061 metal matrix composites reinforced with silicon carbide and graphite particles using stir casting process.
• study the hardness properties, microstructure of the developed hybrid composite.

• develop regression model to predict weight loss of the hybrid composite during wear testing using central composite rotatable design method.

• develop Artificial Neural Network (ANN) model to predict the weight loss of the composite during wear testing.

• study the direct and interaction effects of influencing factors on weight loss of hybrid metal matrix composite during wear testing.

• develop regression models to predict Metal Removal Rate (MRR), Tool Wear Rate (TWR) and Surface Roughness (SR) of the composite during Electric Discharge Machining (EDM).

• develop mathematical models for correlating the direct and interactive influences of the various machining parameters such as current, voltage, pulse on time, flushing pressure on the predominant machining criteria, i.e., the metal removal rate, tool wear rate, and surface roughness.

• study the effect of heat treatment of the hybrid composites on its wear behavior.