CHAPTER 3

METHODOLOGY

3.1 Introduction

This chapter will be explaining the details about the methodology that is involved in this project. There are many processes that need to be accomplished before the fabrication process. This chapter will explain from the beginning of the idea until the fabrication process is done. Besides that, it covers and explains all the process that is involved in the fabrication process such as cutting, assembling and finishing.

3.2 Methodology flowchart

As shown below, Figure 3.1 shows the flow chart of the whole Final Year Project. To make sure this project run smoothly, an appointment was made up weekly with the supervisor.
First of all, the discussion about the literature review with the supervisor had been discussed specifically. In this literature review, there is some briefing from the supervisor about the title given such as objective, problem statement and scopes of this project. After the briefing and detailed explanation from the supervisor, some ideas on how to solve the problem that is faced by the user of the automatic welding machine were discussed.

After going through all the information given, the conceptual design was started. There was a lot of brainstorming before the sketching was started. All the knowledge and ideas have been applied into the sketching in order to achieve the objective. After
the sketching process, concept evaluation was made. In this process, all the sketching
details have been evaluated one by one. After the evaluation process, the best concept
and sketching that will be used as the product final design can easily be determined.
After choosing the best design, the process of finalizing the concept was started. The
design that has been choosen was transformed from rough sketching to engineering
drawing. This has been done using SolidWorks™ software. Using this software, makes
it possible to design in 3D without making any prototyping which costs a lot and use a
lot of time. Besides that, in this process all dimension and geometry of the product can
be specified.

After done with finalizing the design, the material that will be used is being listed.
Next some discussion with the supervisor has been done to discuss about material
selection for the product. As the result from the discussion, aluminum plates for the
torch holders and aluminum profile as the main part has been choose.

After choosing the right material, the fabrication process of the design according to
final design was started. In this process, there are many processes that need to go
through. The first thing that needs to be done is to cut the material into the dimensions
that is needed. Next, another process such as making a pocket using a milling machine,
through hole using drilling machine and others process one by one have been done after
all the material are cut according to the design.

Once the fabrication is done, the product will be tested until get a satisfactory
result was obtained. In this process, the product was attached to the automatic welding
machine. After that, the product performance will be tested by trying to run the
Automatic welding machine. By doing this, any problem that may be occur in the
product would be able to detect. And if so, there will be some modification on the
product until it can perform perfectly.