



FACULTY OF MECHANICAL ENGINEERING

MARA INSTITUTE OF TECHNOLOGY

SHAH ALAM

FINAL YEAR PROJECT REPORT

BACHELOR IN MECHANICAL ENGINEERING (HONOURS)

TITLE:

**CALIBRATION OF MEASURING EQUIPMENT AS PER  
INTERNATIONAL STANDARDS**

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## SYNOPSIS

This project has been carried out to study the application of metrology and calibration activities, which are very important within industrial sector. At present, we have been exposed by modern measuring equipment and high technology of machines, therefore as potential engineers we should prepare ourselves and gain experience especially in activities of measurement and calibration.

We have carried out calibration of a measuring equipment using guidelines based on international standards such as BSI, JIS, ISO, MS ISO/IEC Guide 25, Commonwealth Science Council (CSC), etc. Apart from that, we have studied standards of operation and management of calibration laboratories as required by MS ISO/IEC Guide 25. We hope that this project will provide information and awareness to those involved or wish to involve in measurement and calibration activities before they are carried out.

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## CHAPTER 1: INTRODUCTION TO METROLOGY

### 1.0 Introduction

The importance of quality assurance has become widely appreciated during the last decade and procedures to ensure product quality have now been implemented by almost all-large companies. Increasingly competitive world markets mean that no company will be able to survive for very long if it does not achieve the necessary quality assurance targets.

Measurement and calibration procedures are an essential component within quality control systems, both for monitoring the values of quality-related process parameters at various stages of production and also for inspecting and testing the final product. Measurements at intermediate and final stages of production provide the means for assessing the degree of success of the quality control system operated.

Such measurements are the means by which the customer is assured of the quality of the product. This requires in turn that the quality and accuracy of the measurements must also be guaranteed by a properly managed system of instrument calibration.

### 1.1 Measurement

The International Vocabulary of basic Terms and General Terms in Metrology (VIM) Entry 2.01 defines **measurement** as: -

*“The set operations having the object of determining a value of a quantity”* [1]

Measurement provide numerical descriptions of a variety of products and activities. They are the basis for an extensive range of decisions concerning the everyday lives of human beings in various fields such as trade, industry, science and technology, agriculture, environment control, health and safety. In ancient times, measurement had contributed to the development of civilisation.

The build up of societies has been increasing the demand for measurement. Industrialisation has brought a wider range of technologies and a greater number and complexity of business transactions, mass production and automation have introduced the need for the interchangeability of parts and urbanisation led to larger scales of human interaction.