



**ANTHROPOMETRIC MEASUREMENT TO DESIGN
HIP PROSTHESIS STEM FOR MALAYSIAN POPULATION**

AZNA BINTI SABRAN

(2007271006)

A thesis is submitted in partial fulfillment of the requirement for the award
of Bachelor Engineering (Hons) (Mechanical)

**Faculty of Mechanical Engineering
Universiti Teknologi MARA (UiTM)**

MAY 2010

“I declared that this thesis is the result of my own work except the ideas and summaries which I have clarified their sources. The thesis has not been accepted for any degree and is not concurrently submitted in candidature of any degree”

Signed:
Date : 20/5/2010

Azna Binti Sabran
UiTM No: 2007271006

ACKNOWLEDGEMENT

By the name of ALLAH s.w.t, with His Almighty, the most gracious and merciful. I praise Him and seek His noble Prophet Rasullah s.a.w. Million of grateful to Allah s.w.t. because enable me to complete this research. I would like to express sincere gratitude and appreciation to my supervisor, Mr Abdul Halim Abdullah for his generous guidance, concern, help, patient and encouragement and continue support in duration of the thesis preparation until its completion.

Special thanks to him for the advised, guidance and assistance from beginning until the end of the research work. My gratitude is also extended to my father, Sabran bin arshad, my mother , Azmi binti Abdul Kadir , my family who have been the pushing factor behind my work and it was only by their desire that I have come this far. Finally, thanks to my team members; Rushafinas, Mastura and Norshilawaty and all those who give their contribution and helped me directly and indirectly in making this project success.

“May Allah bless all of you”

ABSTRACT

Total Hip Replacement (THR), is a surgical procedure to remove damaged or diseased parts of the patient's hip joint and replaces them with new artificial parts. The objective of this study is to design and analyze the behavior of Total Hip Replacement based on the anthropometric study. The dimension of the prosthesis stem is modified to suit the measurement of Asian population. Asian populations including Malaysian have a smaller build and stature as compared to Caucasian population. Finite element method is used to model the intact femur and THR femur. The prosthesis stem is defined as bio compatibility material that is titanium alloy (Ti-6Al-4V) while the femur is defined as cortical bone properties.

TABLE OF CONTENTS

CONTENTS	PAGE
PAGE TITLE	i
ACKNOWLEDGEMENT	ii
ABSTRACT	iii
TABLE OF CONTENTS	iv
LIST OF TABLES	vii
LIST OF FIGURES	ix
CHAPTER I INTRODUCTION	
1.1 Project Background	1
1.2 Project Objective	2
1.3 Project Scope	3
1.4 Project Significant	4
CHAPTER II LITERATURE REVIEW	
2.1 Introduction	5
2.2 Total Hip Arthroplasty	5
2.3 Types of Total Hip Arthroplasty	9