#### **CONTENTS**

		Page
ABST	TRACT IN THAI	
ABST	TRACT IN ENGLISH	
ACKI	NOWLEDGEMENTS	
CON	ITENTS	IV
LIST	OF TABLES	VI
LIST	OF FIGURES	VII
LIST	OF ABBREVIATIONS	IX
СНА	PTER	
I	INTRODUCTION	1
	1.1 Background	1
	1.2 Research objectives	3
II	LITERATURE REVIEW	4
	2.1 The golf swing movement	4
	2.2 Biomechanics in golf analysis	7
	2.3 Related research	12
Ш	MATERIALS AND METHODS	17
	3.1 Population and sampling	17
	3.2 Instrumentation	19
	3.3 Construction and efficiency of the instrument	19
	3.4 Data collection	20
	3.5 Statistics used to analyze data	26
IV	RESULTS AND DISCUSSIONS	28
	4.1 Demographic characteristics and basic variables	29
	4.2 Plantar pressure and changes during the golf swing	29
	4.3 Correlation between plantar pressure and energy transfer	44
	1.1 Stand (ST)	16

# CONTENTS (Continued)

	Page	
4.5 Middle backswing (MB)	51	
4.6 Top of backswing (TB)	57	
4.7 Ball Impact	62	
4.8 Early Finish (EF)	67	
V CONCLUSIONS	73	
REFERENCES		
APPENDICES		
APPENDIX A NORMAL FOOT PRESSURE DURING THE GOLF SWING	81	
APPENDIX B PUBLICATION	85	
CURRICULUM VITAE	95	

## LIST OF TABLES

Table	Page
3.1	All 42 location points
4.1	Statistical Description of Individual Characteristics
4.2	Differences in normal pressure in the left foot between the driver and 7-iron
	golf clubs in professional player at the key moments of the swing29
4.3	Differences in normal pressure in the right foot between the driver and 7-iron
	golf clubs in professional player at the key moments of the swing30
4.4	Differences in normal pressure in the left foot between professional and
	high handicap players using a driver at the key moments of the swing36
4.5	Differences in normal pressure in the right foot between professional and
	high handicap players using a driver at the key moments of the swing37
4.6	Differences in normal pressure in the left foot between professional and
	high handicap players using a 7-iron at the key moments of the swing40
4.7	Differences in normal pressure in the right foot between professional and
	high handicap players using a 7-iron at the key moments of the swing41
4.8	Correlation between segment power and plantar pressure of the left foot
	in the professional group using a driver at the key moments of the swing44
4.9	Correlation between segment power and plantar pressure of the right foot
	in the professional group using a driver at the key moments of the swing45

## LIST OF FIGURES

Figure		Page
3.1	Color atlas of skeletal landmark definitions	23
3.2	Key moments of the swing	24
3.3	Eight Foot plantar areas defined for the statistical analysis	24
3.4	Illustrates the energy flow at the lumbosacral junction (L5S1)	26
4.1	Average maximum plantar pressure distribution across different foot area	S
	between the driver and 7-iron golf clubs in professional player	31
4.2	Mean normalized segment power in professional players	
	using a driver	32
4.3	Mean normalized segment power in professional players	
	using a 7-Iron	32
4.4	Mean normalized segment power in professional players	
	using a driver and 7-iron	33
4.5	Mean normalized segment power in high handicap players	
	using a driver	34
4.6	Mean normalized segment power in high handicap players	
	using a 7-iron	35
4.7	Mean normalized segment power in high handicap players	
	using a driver and 7-iron	35
4.8	Average maximum plantar pressure distribution across different foot areas	S
	between professional and high handicap players using a driver	39
4.9	Mean normalized segment power between professional	
	and high handicap players using a driver	39

# LIST OF FIGURES (Continued)

Figure	P	age
4.10	Average maximum plantar pressure distribution across different foot areas	
	between professional and high handicap players using a 7-iron	42
4.11	Mean normalized segment power between professional	
	and high handicap players using a 7-iron	43

#### LIST OF ABBREVIATIONS

CoP Center of Pressure

KE Kinetic Energy

GRF Ground Reaction Force

OB Out of Bounds

DOF Degrees of Freedom

COM Center of Mass

COG Center of Gravity

JFP Joint Force Power

STP Segment Torque Power

JTP Joint Torque Power

SP Segment Power

BSP Body Segment Parameter

Pro Professional Golfer

High High-handicap Amateur Golfer

3D Three Dimensional

ST Stand

MB Middle Backswing

TB Top of Backswing

IM Ball Impact
EF Early Finish

FN Finish

GT Great Toe

LT Lesser Toe

MEDmet Medial Metatarsal

## LIST OF ABBREVIATIONS (Continued)

CENmet Central Metatarsal

LATmet Lateral Metatarsal

MEDarc Medial Arch

LATarc Lateral Arch

HEEL Heel

BMI Body Mass Index

L5S1 Lumbosacral junction