



UNIVERSITI TEKNOLOGI MARA

PHT414: MOVEMENTS SCIENCE

Course Name (English)	MOVEMENTS SCIENCE APPROVED
Course Code	PHT414
MQF Credit	2
Course Description	This course enhances the students in gaining knowledge and understanding of the concept associated with human movement. Investigation of movement science with emphasis on foundational biomechanical principles related to human posture and movement. Qualitative and quantitative movement analysis is presented with emphasis on clinical application
Transferable Skills	1. Knowledge 2. Practical skills 3. Cognitive skills
Teaching Methodologies	Lectures, Demonstrations, Tutorial
CLO	CLO1 Explain the biomechanical principles of movement, balance and posture in human. CLO2 Display observational and instrumented analysis of movement, balance and posture in human. CLO3 Analyse the biomechanical mechanisms underlying neuro-musculoskeletal disorders and clinical decision-making in physiotherapy practice.
Pre-Requisite Courses	No course recommendations
Topics	
1. Biomechanical principles and body mechanics 1.1) Mechanics 1.2) Basic units 1.3) Nine Principles for application of biomechanics 1.4) Linear and angular kinematics 1.5) Linear kinetics 1.6) Angular kinetics	
2. Quantitative and qualitative analysis 2.1) Joint integrity and mobility. 2.2) Anatomical position 2.3) Directional terms 2.4) Joint motion	
3. Material and structural properties of musculoskeletal tissues. 3.1) Tissue loads 3.2) Response of tissue to force 3.3) Biomechanics of the Passive-Tendon Unit (MTU) 3.4) Biomechanics of ligaments 3.5) Three mechanical characteristics of muscle 3.6) Stretch-shortening cycle (SSC) 3.7) Force-time principle	
4. Neuromuscular Control 4.1) Muscle action 4.2) Active and passive action of muscle 4.3) Regulation of muscle force 4.4) Electromyography 4.5) Proprioception of muscle action and movement 4.6) Muscle inhibition and disinhibition	

5. Posture Analysis 5.1) N/A
6. Mechanics of Postural Control 6.1) N/A
7. Ergonomics 7.1) N/A
8. Observational movement analysis (supine-to-side lying, sit-to-stand) 8.1) N/A
9. Observational gait analysis 9.1) N/A
10. Instrumented gait analysis 10.1) N/A

Assessment Breakdown		%	
Continuous Assessment		100.00%	

Details of Continuous Assessment	Assessment Type	Assessment Description	% of Total Mark	CLO
	Assignment	Assignment	30%	CLO3
	Practical	Practical Test	40%	CLO2
	Test	Theory test	30%	CLO1

Reading List	Recommended Text
	<ul style="list-style-type: none"> • Donald A. Neumann 2016, <i>Kinesiology of the Musculoskeletal System</i>, Mosby [ISBN: 0323287530] • Carolyn Kisner, Lynn Allen Colby, John Borstad 2017, <i>Therapeutic Exercise</i>, F. A. Davis Company [ISBN: 0803658508] • Jan Adams, Kay Cerny 2018, <i>Observational Gait Analysis</i>, Slack [ISBN: 1630910406]

Reading List	Reference Book Resources
	<ul style="list-style-type: none"> • Shumway-Cook 2016, <i>Motor Control</i>, Wolters Kluwer Law & Business [ISBN: 149630263X] • Margareta Nordin, Victor Hirsch Frankel 2012, <i>Basic Biomechanics of the Musculoskeletal System</i>, Lippincott Williams & Wilkins [ISBN: 1609133358] • David Levine, Jim Richards, Michael Whittle 2012, <i>Whittle's Gait Analysis</i>, Churchill Livingstone [ISBN: 070204265X] • Jane Johnson 2011, <i>Postural Assessment</i>, Human Kinetics Publishers [ISBN: 1450400965] • Judith Aston, <i>Aston Postural Assessment</i> [ISBN: 1912085348] • Theresa Stack, Lee T. Ostrom, Cheryl A. Wilhelmsen 2016, <i>Occupational Ergonomics</i>, John Wiley & Sons [ISBN: 1118814215]

Article/Paper List	This Course does not have any article/paper resources
Other References	This Course does not have any other resources