



MGM INSTITUTE OF HEALTH SCIENCES

(Deemed to be University u/s 3 of UGC Act, 1956)

Grade 'A' Accredited by NAAC

Sector-01, Kamothe, Navi Mumbai -410 209

Tel 022-27432471, 022-27432994, Fax 022 -27431094

E-mail: registrar@mgmuhs.com; Website :www.mgmuhs.com

Curriculum for Fellowship in Clinical Biomechanics

Approved as per BOM - 53/2018, Dated 19/05/2018

Amended History

1. Approved as per BOM - 53/2018, [Resolution No.4.8], Dated 19/05/2018.

Syllabus: Clinical Biomechanics

Objectives:

- To understand Structural Anatomy, kinetics and kinematics of movement.
- To understand principles of biomechanical modelling
- To understand role of muscle activity for performing movement
- To understand theories of movement control and loading
- To understand basic methodology of movement analysis
- To be able to integrate and apply the above to analyze movement problems encountered in patient population

Outcome: On completion of this fellowship course you will achieve enhanced understanding of scope of movement analysis in patient evaluation

Sr. No	Title	Hours
1	Structural Anatomy <ul style="list-style-type: none">➤ Identifying major groups of muscle and ligaments➤ Mechanical properties of bones and soft tissues➤ Surface anatomy and landmarks	06
2	Kinetics of movement <ul style="list-style-type: none">➤ Internal and external forces➤ Force systems➤ Ground Reaction force➤ Levers➤ Concept of Levers with mechanical advantage➤ Moments and levers➤ Moment Arm	05
3	Link segment modelling and inverse dynamics <ul style="list-style-type: none">➤ Balancing internal, external moments and forces➤ Computerised movement analysis➤ Quantitative movement analysis by the means of Inverse dynamics➤ Link segment modelling➤ Free body diagrams- equations of force and moment➤ Net joint Moment and Power	05
4	Muscles and movement	05

	<ul style="list-style-type: none"> ➤ Anatomical structures that can produce internal forces and moments ➤ Internal forces and moments around joints ➤ Concentric versus eccentric muscle actions ➤ Elasticity of muscles – application during vertical jump ➤ Net joint moment and power during walking ➤ Net joint moment and power during running ➤ Quantitative gait analysis ➤ Electromyography 	
5	<p>Motor control of functional movement the brain as a problem solver</p> <ul style="list-style-type: none"> ➤ Evolving theory of motor control ➤ The brain as problem solver ➤ Task oriented approach ➤ The degrees of freedom problem ➤ Kinematic chains ➤ Displacement and velocity profiles ➤ Whole body control during gait ➤ Motor learning and motor recovery in presence of injury or disease 	05
6	<p>Musculoskeletal conditions loading stability and OA</p> <ul style="list-style-type: none"> ➤ Biomechanics of dynamic knee stability ➤ Recovery of dynamic knee stability ➤ Differences in deceleration styles ➤ Objective of landing ➤ Telescopic inverted pendulum model ➤ Knee joint stability and loading ➤ Role of meniscus ➤ Knee joint loading – gait, squatting, ACL deficit 	04

- Objective Practical and theory Evaluation after each Module



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