MGM INSTITUTE OF HEALTH SCIENCES

Accredited by NAAC with 'A' Grade

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

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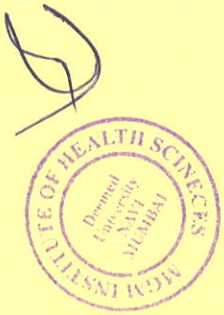
Curriculum for Fellowship in Clinical Biomechanics

(w.e.f. Academic Year 2018-19)

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 n 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** ➢ Identifying major groups of muscle and ligaments ➢ Mechanical properties of bones and soft tissues ➢ Surface anatomy and landmarks	06
2	**Kinetics of movement** ➢ 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** ➢ 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

	➢ 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	**Motor control of functional movement the brain as a problem solver** ➢ 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	**Musculoskeletal conditions loading stability and OA** ➢ 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