

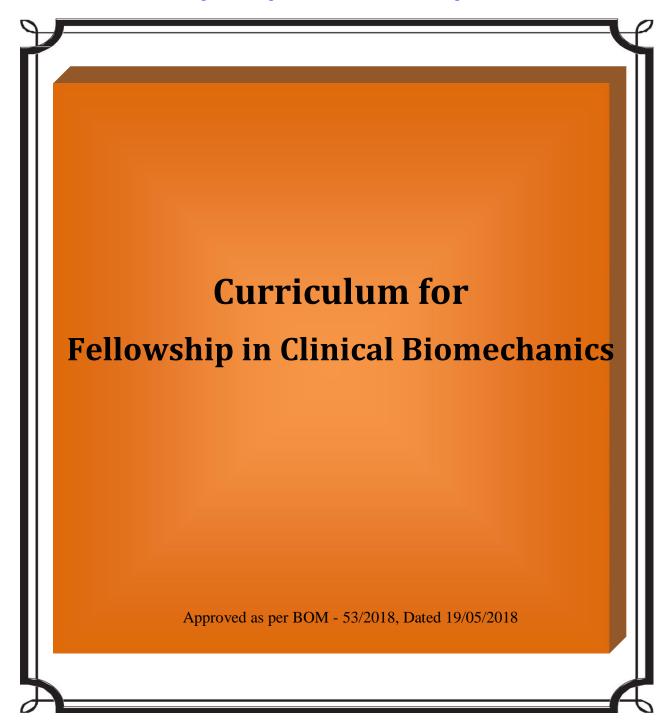
# MGM INSTITUTE OF HEALTH SCIENCES

(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: <a href="mailto:registrar@mgmuhs.com">registrar@mgmuhs.com</a>; Website: <a href="mailto:www.mgmuhs.com">www.mgmuhs.com</a>;



## **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 n patient population

Ų.

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

| Sr.<br>No | Title  | Hours |
|-----------|--|-------|
| 1         | Structural Anatomy   | 06    |
|           | Identifying major groups of muscle and ligaments   |       |
|           | Mechanical properties of bones and soft tissues  |       |
|           | Surface anatomy and landmarks  |       |
| 2         | Kinetics of movement   | 05    |
|           | > Internal and external forces   |       |
|           | > Force systems  |       |
|           | > Ground Reaction force  |       |
|           | > Levers   |       |
|           | Concept of Levers with mechanical advantage  |       |
|           | Moments and levers   |       |
|           | > Moment Arm   |       |
| 3         | Link segment modelling and inverse dynamics  | 05    |
|           | Balancing internal, external moments and forces  |       |
|           | > Computerised movement analysis   |       |
|           | Quantitative movement analysis by the means of Inverse   |       |
|           | dynamics Link segment modelling  |       |
|           | Link segment modelling  Free body diagrams, agustians of force and manual                              |       |
|           | <ul><li>Free body diagrams- equations of force and moment</li><li>Net joint Moment and Power</li></ul> |       |
| 4         | Muscles and movement   | 05    |

|  | <ul> <li>Anatomical structures that can produce internal forces and moments</li> <li>Internal forces and moments around joints</li> <li>Concentric versus eccentric muscle actions</li> <li>Elasticity of muscles – application during vertical jump</li> <li>Net joint moment and power during walking</li> <li>Net joint moment and power during running</li> <li>Quantitative gait analysis</li> </ul> | 4  |
|--|---|----|
|  | > Electromyography  |    |
| 5  | Motor control of functional movement the brain as a   | 05 |
| TEMPORAL POLICY CONTRACTOR CONTRA | <ul> <li>problem solver</li> <li>Evolving theory of motor control</li> <li>The brain as problem solver</li> <li>Task oriented approach</li> <li>The degrees of freedom problem</li> <li>Kinematic chains</li> <li>Displacement and velocity profiles</li> <li>Whole body control during gait</li> <li>Motor learning and motor recovery in presence of injury or disease</li> </ul>                       |    |
| 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



### 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 - 410209 Tel 022-27432471, 022-27432994, Fax 022-27431094

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

