Module Title **Clinical Gait & Movement Analysis** **Keywords** Gait Cycle, rockers, forces, moments, powers, kinematics, kinetics	Reference HSM086 SCQF SCQF Level 11 SCQF Points 30 ECTS Points 15 Created November 2010 Approved June 2011 Amended May 2016 Version No. 3

Prerequisites for Module

Refer Regulation A2: Admission for admission requirements and/or course specific entry requirements.

Corequisite Modules

None.

Precluded Modules

None.

Aims of Module

To provide students with an advanced theoretical and practical base for examining the biomechanical aspects of human gait.

Learning Outcomes for Module

On completion of this module, students are expected to be able to:

Value of objective analysis of gait to include video, 3D Motion Analysis, Force Platform and EMG Output as well as observational and temporal-spatial analysis. Interpretation and analysis of data. Normal and pathological gait. Effects of orthotics and prosthetics on gait. Biomechanics of screening in sport prehabilitation, application of isokinetic dynamometry and biometic force/torque and angle plots into the indicative module content.

Indicative Student Workload

Contact Hours	Full Time
Lectures	20
Practicals	40
Workshops	30
Directed Study	
Computer Assisted Learning	40
Core Reading	70
Private Study	

1. Critically analyse gait and movement using biomechanical principles.
2. Evaluate the qualitative and quantitative methods of biomechanical analysis of gait and movement.
3. Analyse, interpret and evaluate useful data using 3-D Motion Capture, Force Plate and Electromyography equipment.
4. Analyse the muscle forces and loads on joints during gait using established modelling techniques.
5. Evaluate the differences between normal and pathological gait and categorise gait through pattern recognition.

Indicative Module Content

Revision of basic mechanical concepts with reference to gait: Forms of motion, linear and angular kinematics and kinetics. Introduction to segmental modelling techniques. Kinematic Conventions - Absolute spatial reference system, description of segments in 3D space. Definition of Euler angles. Link segment equations and free body diagrams. Calculation of joint forces, moments and powers. Mechanical work, energy and power. The use of Electromyography.

Mode of Delivery

This module will be delivered through lectures, laboratory practicals based and problem solving workshops. Computer assisted learning packages will be used to supplement learning.

Assessment Plan

	Learning Outcomes Assessed
Component 1	1,2,3,4,5

Component 1 will take the form of a 4500-word extended laboratory report based on data collected from multiple measurement tools. Students will be given raw data to process, analyse, critically interpret and evaluate.

Indicative Bibliography

1. KIRTLEY, C., 2005. Clinical Gait Analysis: Theory and Practice. Churchill Livingstone.
2. ALLARD P., CAPPOZZO A., LUNDBERG A., VAUGHAN C., 1998. Three Dimesional Analysis of Human Locomotion. John Wiley & Sons, Inc.
3. WHITTLE, M.W., 2001. Gait Analysis: An Introduction. Butterworth-Heinemann Ltd

Electromyography.

4.PERRY, J., BURNFIELD, J., 2010. Gait Analysis: Normal and Pathological Function. SLACK Incorporated.