

SUBJECT DESCRIPTION FORM

SUBJECT CODE: HTI3123

SUBJECT TITLE: Principles of Human Movement Analysis

CREDITS: 2

PRE-REQUISITES: HTI2121 Introduction to Biomechanics
Or Equivalent

RESPONSIBLE DEPARTMENT: Department of Health Technology & Informatics

RESPONSIBLE MEMBER OF THE ACADEMIC STAFF:

Prof. Daniel H.K. CHOW

CONTACT HOURS:

Lecture	22 hours
Tutorial	4 hours
Laboratory	<u>4 hours</u>
Total Contact	30 hours

RATIONALE:

Human Movement Analysis is one of the most important applied biomedical engineering subjects for quantitative evaluation of human movements.

LEARNING OUTCOMES:

On successfully completing the subject, students should be able to:

- Understand the functions of instrumentation commonly use for human movement analysis
- Apply kinematics to investigate three-dimensional angular and linear motion of body segments
- Apply free body diagram and inverse dynamics to determine three-dimensional body kinetics
- Explain muscular activities by kinetics and electromyography
- Develop biomechanical model for handling indeterminate system

SYLLABUS:

Instrumentation for movement analysis; anthropometry; three-dimensional kinematic and kinetic analysis; electromyography; biomechanical models for indeterminate systems; posture and balance; examples of clinical applications of human movement analysis.

TEACHING-LEARNING METHODS:

There will be lectures and tutorial sessions as well as laboratory demonstrations. Group project will be utilized to facilitate students to apply what they learned in the class to solve clinical questions.

ASSESSMENT:

Continuous Assessment	60%
Final Examination	40%

Note: To pass this subject, students must obtain grade D or above in BOTH the continuous assessment and the examination.

REFERENCE MATERIALS:

1. Allard P, Stokes IAF and Blanche JP, Three-Dimensional Analysis of Human Movement. Champaign: Human Kinetics, 1995
2. Greene DP and Roberts SL, Kinesiology: Movement in the Context of Activity. St. Louis: Mosby, 1999
3. Hamill J and Knutzen KM, Biomechanical Basis of Human Movement. Williams & Wilkins, 1995.
4. Nigg BM and Herzog W, Biomechanics of the Musculoskeletal System. Wiley, New York, 1994.
5. Perry J, Gait Analysis: Normal and Pathological Function. Slack, 1992.
6. Sparrow WA, Energetics of Human Activity. Champaign: Human Kinetics, 2000
7. Vaughan CL, Davis DL and O'Connor JC, Dynamic of Human Gait. Champaign: Human Kinetics, 1992.
8. Wallace SA, Perspectives on the Coordination of Movement. New York, NY: Elsevier Science Publishers Co. Inc., 1989.
9. Winter DA, Biomechanics and Motor Control of Human Movement. Wiley, 1990.
10. Winter DA, The Biomechanics and Motor Control of Human Gait. University of Waterloo Press, 1988.