

SUBJECT DESCRIPTION FORM

SUBJECT CODE: HTI2121

SUBJECT TITLE: Introduction to Biomechanics

CREDITS: 3

PRE-REQUISITES: Nil

RESPONSIBLE DEPARTMENT: Department of Health Technology & Informatics

RESPONSIBLE MEMBER OF THE ACADEMIC STAFF:

Dr. Ming Zhang

CONTACT HOURS:

Total Contact	42 hours
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RATIONALE:

Biomechanics is one of the most important supporting subjects for the principles and practices of health technology. This subject applies the principles of statics and dynamics extensively in the biomechanical context.

LEARNING OUTCOMES:

At the end of the subject, students are expected to be able to:

1. Understand the fundamentals of rigid body mechanics;
2. Apply kinematics and kinetics to load and motion analysis for human body supports and musculoskeletal system; and
3. Explain how our bodies, in particular the musculoskeletal system, function.

SYLLABUS:

Fundamentals of mechanics, free body diagram (FBD), statics applied to musculoskeletal system, dynamics, kinematics of particle and rigid body, kinetics of particle and rigid body, , work and energy, inverse dynamics, human joint load analysis, application to body support system.

TEACHING-LEARNING METHODS:

There will be lectures and tutorials dealing with fundamental mechanics and application examples on human body. As a complementary, on-line web teaching materials will be provided for students to self-learn.

ASSESSMENT:

40% Continuous assessment (including home assignments and class quiz)
60% Final examination

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

REFERENCE MATERIALS:

1. Nordin M and Frankel VH, ed., Basic Biomechanics of the Musculoskeletal System, Lea & Febiger, Philadelphia, 1989 or 2001
2. Ozkaya N and Nordin M, Fundamentals of Biomechanics: Equilibrium, Motion, and deformation, Van Nostrand Reinhold, New York, 1999.
3. Nigg BM and Herzog W, Biomechanics of the Musculoskeletal System, Wiley, New York, 1994.
4. Mow VC and Hayes WC, Basic Orthopaedic Biomechanics, Raven Press, New York, 1991.
5. Riley WF, Sturges LD and Morris DH, Statics and Mechanics of Materials, John Wiley & Sons Inc., 1996.