	National University of Sciences and Technology	
	Course Description	
Course Title	**Course Code**	**Credit Hours**
Biomechanics	BMES-832	3 – 0

TEXT BOOK:

- Biomechanics of the Musculoskeletal System. Edited by B. Nigg and W. Herzog, third Edition, Wiley 2007 (latest edition).

REFERENCE BOOK

- Nihat Ozkaya, Dawn leger, David Goldsheyder and Margareta Nordin. Fundamentals of Biomechanics, Equilibrium, Motion, and Deformation, 4th edition Springer

COURSE OBJECTIVES:

- Describe the various elements comprising a computational model of the human neuromusculoskeletal system.
- Formulate and solve differential equations that govern the motion of rigid-body (link-segmental) dynamical systems.
- Describe the mechanical properties of various soft tissues, especially muscle, ligament, and tendon.
- Formulate and solve differential equations that incorporate the major physiological properties of muscle, ligament, and tendon.
- Formulate simple, integrative models of the human neuromusculoskeletal system.
- Use computational models of the human body to study movement.

COURSE OUTLINES

- Overview of Biomechanics: Definition, Scope, and Applications
- Introduction to Human Motion Linear Kinematics, Uniaxial motion, Dimensions, units
- Kinetics and Dynamics:
- Skeletal Anatomy
- Biomechanics of Skeletal Tissues
- Mechanical Properties of Biological Tissues
- Biomechanics of bone
- Biomechanics of Ligament
- Mechanical Characteristics of Muscle
- Neuromuscular control
- Muscle Modeling
- Muscle Activation Dynamics
- Analysis of Biomechanical Systems
- Determining Muscle Forces

ASSESSMENTS

Description	Percentage Weightage (%)
Assignments	05-10%
Quizzes	10-15%
Mid Semester Exams	30-40%
End Semester Exam	40-50%