

ID	3660
Curricular Unit	Occupational Biomechanics
Regent	António Prieto Veloso
Learning Outcomes	<ul style="list-style-type: none"> - To develop the competence to recognize, assess and analyze, within the Human Behaviour domain, the biomechanical functions resulting from the adaptation to Mechanical Laws. - To develop the competence to work with the Biomechanics methods, by the basic physics and mathematical applications in theory either in Laboratory situations, both in general motor patterns and in the specific motor tasks.
Syllabus	<ol style="list-style-type: none"> 1. BASIC CONCEPTS AND PHILOSOPHICAL APPROACH - The aim and definition of Biomechanics within the Human Movement Behavior. 2. MODELING OF HUMAN BODY - Single point representation of the body, rigid body and multi-body approach in association with intrinsic factors, such as morphology and anatomy. 3. KINEMATICS FOR BIOMECHANICAL ANALYSIS - General concepts for both linear and angular position, velocity and acceleration. Numerical methods to compute derivatives using experimental kinematical data. 4. KINETIC FOR BIOMECHANICAL ANALYSIS - Specific definition of load, pressure and ground reactive force. Study of the ground reaction force during foot contact. 5. DYNAMICS FOR BIOMECHANICAL ANALYSIS - Concepts of Inertia and Moment of Inertia; Linear Momentum and Angular Momentum, Force and Work. 6. ANALYSIS OF SPECIFIC TASKS - Applications according to common tasks in ergonomics: Manual Lifting and handling of instruments with unfavorable postures of the upper limb.
Evaluation	<p>60% - Written tests covering all the contents</p> <p>40% - Problem solving tests and tasks simulation in laboratory setting</p>
Bibliography	<p>No site da disciplina (www.fmh.utl.pt/disciplinas/biomecanica) poderá encontrar os documentos básicos de apoio às aulas bem como informações pertinentes da disciplina. Deverá, no entanto, complementar esta informação com os livros:</p> <ul style="list-style-type: none"> - Raymond A. Serway; John W. Jewett, J. (2004). Princípios de Física: Mecânica Clássica (Vol. 1). São Paulo: Thomson. - Enoka, R. (2002). Neuromechanics of Human Movement (3.ª ed.). Champaign: Human Kinetics.