


Teacher(s)	Schepens Bénédicte ;
Language :	French
Place of the course	Louvain-la-Neuve
Prerequisites	Basic knowledge of mathematics and physics acquired in secondary school and during the BAC LFSM1105 course
Main themes	<ul style="list-style-type: none"> • Statics and dynamics of movement • Analysis of walking, running and other movements specific to physiotherapists and specific to physical educators (running, throwing, jumping and rotation) • Biomechanical parameters that influence walking and running, such as speed, cadence, symmetry, balance, coordination, etc.
Learning outcomes	<p>At the end of this learning unit, the student is able to :</p> <ul style="list-style-type: none"> - Apply the concepts of mechanics to the human body (2.1, 11.1 Physio – 9.1 EP) - Analyze the movement of the human body in terms of joint and muscular mechanisms (2.1, 11.1 Physio – 9.1 EP) - Apply the principles of biomechanics to real applications (sport, clinical/daily life actions) (11.1, 11.2 Physio – 9.1 and 9.2 EP) - Use biomechanical analysis tools (such as kinematics, kinetics) to measure the biomechanical parameters of movements (2.1, 11.1 physiotherapist – 9.1 EP) 1 - Apply the concepts of energy, work and muscular power to the analysis of the movement of the human body (2.1, 5.1, 11.1, 11.2 Kiné – 9.1 and 9.2 EP) - Identify the suitable and unsuitable technical characteristics of a gesture (5.1, 11.1, 11.2 Kiné – 9.1 and 9.2 EP) - Analyze sports practices and highlight the biomechanical principles used to improve motor performance (5.1, 11.1, 11.2 Kiné – 9.1 and 9.2 EP) - Describe the biomechanical adaptations that occur during recovery from injury/immobilization or after training and the consequences on musculoskeletal function. (11.1, 11.2 Physio – 9.1 and 9.2 EP)
Evaluation methods	<p>The assessment of learning outcomes is carried out through a written exam organized on Moodle and held in the lecture hall, using a laptop or tablet. Students who do not have adequate equipment are invited to report this at the beginning of the semester so that a solution can be arranged.</p> <p>The exam combines different types of questions in order to evaluate knowledge, understanding, and analytical skills in a balanced way: for example, single- or multiple-choice questions, short open-ended questions, and figure-interpretation exercises. Each question is weighted equally. The distribution of questions across the course content is approximately proportional to the time devoted to that content in class. The final grade is expressed on a 20-point scale, with the pass mark set at 10/20. For the calculation of the final grade, arithmetic rounding to the nearest integer is systematically applied, except for grades below 10/20, which are rounded down to the lower integer. Attendance in the lecture hall is mandatory and confirmed by signing an attendance sheet; failure to sign or absence on the day of the exam will result in the exam being considered invalid.</p>
Teaching methods	<p>The course aims to provide students with mathematical tools to model and understand human body movement.</p> <p>Theory: Lectures, illustrated by numerous exercises.</p> <p>Practical work: Sessions dedicated to solving exercises.</p>
Content	<p>The course content will be divided into four parts:</p> <ul style="list-style-type: none"> • Anthropometry: Concepts of rigid bodies, center of gravity, and moment of inertia. • Kinetic analysis: Calculation of forces and moments of force in a static situation. • Dynamic situations and concepts of energy, work, and power. • Movement analysis, such as normal and pathological walking. The concepts learned in the previous three sections will be integrated into clinical case examples. <p>The student will be required to use basic biomechanics in an integrated way in the field of motor sciences: joint movement analysis; mechanical work during movement; pathological gait analysis; balance and posture.</p>

Inline resources	Moodle
Other infos	This course is strictly reserved for FSM students and is not open to other UCLouvain students.
Faculty or entity in charge	FSM

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Bachelor in Motor skills : General	EDPH1BA	5		
Bachelor in Physiotherapy and Rehabilitation	KINE1BA	5		