ID	2684
Curricular Unit	Neuromuscular Function
Regent	Pedro Luís Camecelha de Pezarat Correia
Learning Outcomes	Identify and understand the neuromuscular factors that influence strength, power and flexibility and describe their acute and chronic adaptations to training. Understand the contribution of electromyography for the study of neuromuscular function and know the main processes of signal recording and processing. Based on kinematic and EMG data, describe the sequence of neuromuscular coordination patterns during fundamental sport skills (e.g. throwing, kicking, running, jumping). Know the basis of isokinetic evaluation and its utility and limitations in neuromuscular assessment of athletes. Know the muscular and neural sources for muscular fatigue and their relationships with different types of neuromuscular solicitation.
Syllabus	1 – Characteristics of skeletal muscle: mechanical model d skeletal muscle; force/length relation; force/velocity relation. 2 – Electromyography: physiological basis, methods and studies on sport. 3 – Organization and control of human movement: inter and intramuscular coordination mechanisms; reflex mechanisms of control; brain mechanisms of control. 4 – Analysis of muscular patterns in sport movements. 5 – Neuromuscular fatigue. 6 – Neuromuscular changes with training: increase um muscle mass; muscular remodelation; neural changes.
Evaluation	Oral and power point presentations about the different topics followed by discussion. Selected readings are suggested for each topic. Presentation and critical discussion about some selected papers in each topic are done with special emphasis on Methology and Results points. Practical EMG recording and fundamental steps of EMG processing. Evaluation through a written test composed by two parts: 1) American test, 2) open questions.

Bibliography	Pezarat-Correia, P. (2012). Aparelho Locomotor, Volume II: Coordenação Neuromuscular e Adaptações à Atividade Física. Lisboa: Edições FMH. Pezarat-Correia, P., & Mil-Homens, P. (2004) (Ed.). A Electromiografia no Estudo do Movimento. Lisboa: Edições FMH. Folland, J., & Williams, A. (2007). The adaptations to strength training: Morphological and neurological contributions to increased strength. Sports Medicine, 37, 145-168. Enoka, R. (2002). Neuromechanics of Human Movement. Human Kinetics: Champaign. IL. Pezarat-Correia, P. (2010). Perfil muscular do ombro de atletas praticantes de acções de lançamento. Revista Portuguesa de Fisioterapia no Desporto, 4, 1: 34-42. (http://www.apfisio.pt/gifd_revista/pages/inicio.php)