Course title: THEORETICAL BASIS OF APPLIED RESEARCHES 2

Lecturer or lecturers (last name, middle name)**:Ilic B. Dusko, Jankovic N. Nenad**

Course status: Obligatory

ECTS: 10

Condition: Listened subjects from the first and second semester

Course objectives:

- To enable understanding of the nature and complexity of motor control systems applied to sport, physical education and sport (hereinafter SPER) in accordance with physiological, biological, psychological, biomechanical and motor control methodology, also in relation to age, appropriate learning methods, as well as their timing and way of combination.
- To familiarize students with research approaches in order to comply with the principle of efficiency, economy and biometric justification in sports, physical education and recreation.
- To familiarize students with current research problems and the degree of their application in SPER.

Course outcome:

As a result of successful accomplishing of all compulsory program obligations, it is expected that students will be able for the use of research methods and procedures from basic fundamental areas of biomechanics and motor control in independent creation and solving of research problems in SPER. Creating stabile functional causally-consequential relationships between biomechanical characteristics of the body with kinematics and dynamics of motion.

Course description:

Biomechanical structure: Application of knowledge from the mechanism of movement of the musculoskeletal system and their relationship with anthropomorphic models. Application of knowledge from biomechanical properties of muscles, and then of nervous-muscular systems. Application of knowledge from the muscular activation scheme and their relation to movement patterns in relation to mechanical conditions for carrying out movement and in relation to motor tasks. Application of different walk techniques to rehabilitation and morpho-structural purposes. Application of the polygon components of force, moment, impulse and momentum of the segments and systems in the individual and collective sports. Application of 3D reconstructions of errors in terms of position, time and speed in sports technique. Applying the knowledge from the geometric scaling for the purpose of test validation in school as well as creating conditions for competition in accordance with age and observance of legality in which creates a top sporting result.

Motor control structure: Application of knowledge from information processing and creation of different models for complexity of the motor assignment. Application of the knowledge from the senses and attention. Principles of speed and accuracy in order to create exact motor tasks. Application of knowledge from coordination schemes with respect to individual differences and abilities. Adaptation of concepts of motor learning to the population in sports practice, schools and recreation centers. Implementation of knowledge from the way of memory structure and different forms of measurements of motor transfer and its application in sport and physical education. Creation of strong logical connections in terms of soft tissue elements in the process of organized physical activity and training. Creating the conditions for applying the model of motor skills in relation to the sample that need to be passed by the standard ones work procedures at school or in adequate sport.

References:

1. Gordon E. Robertson, Graham Caldwell, Joseph Hamill, Gary Kamen, Sandy Whittlesey. *Research Methods in Biomechanics*. Champaign, IL: Human Kinetics; 2004.
2. Haibach, P.S., Reid, G. And Collier D.H.(2011). Motor Learning and Development. Champaign: Human Kinetics.
3. Schmidt, R.A., Wrisberg, C.A.(2004). Motor Learning and Performance. Champaign: Human Kinetics.
4. Schmidt, R.A., Lee, T.D. (2005). Motor control and learning a behavioral emphasis. Champaign : Human Kinetics
5. lic, B.D., Mrdakovic, D.V. (2009). Neuromehanicke osnove pokreta, STR Gajić.

No. of active classes	Lectures:	Study research work:
	4	**4**

Teaching method: Lectures, work in small groups, seminar papers, homework assignments

Knowledge assessment (maximum score 100)

Class Activites- **30**
Colloquium- **30**
Oral exam–**40**