Name of the course: RESEARCH IN BIOMECHANICS

Teacher(s): Dusko Ilic; Dragan Mirkov

Course status: Compulsory

Number of ECTS points:10

Requirement: None

Course objective:

To get insight into applying the biomechanical methodology used to explore various research problems of human locomotion.

Establishing the necessary connections between classical anatomical and physiological knowledge about the locomotor system and kinesiological properties of various human movement structures.

Introduction to biomechanical instrumentation, methods, and procedures used in biomechanical measurements. Introduction to different techniques used in the analysis and interpretation of the obtained results.

Outcome of the course:

After finishing the program, students are expected to be able to:

- Identify relevant research problems.
- Plan and perform research in the field of biomechanics of human movement.
- Adequately apply biomechanical instrumentation, methods and procedures in independent solving of research problems in human locomotion biomechanics.

Content of the course:

Definitions. Mechanisms of human locomotion. Adequate application of the anthropomorphic models. Anthropometry. Biomechanical properties of muscles. Neuromuscular systems. Functional electrical stimulation. Gait. Assessment of local muscle fatigue. Examples from sports activities. Estimation of components of force, momentum, momentum, and momentum of segments and systems. Regression and geometric procedures. Motion data spectrum analysis, stochastic noise reduction by recognition models, and filtering techniques. Practical application of the system for motion analysis: configuration, motion recording, calibration, marking of reference anatomical locations, 3D reconstruction. Presentation of obtained results numerically, graphically, etc. Interpretation of results. Estimating motion efficiency.

Recommended literature

1. Peter M. McGinnis. *Biomechanics of Sport and Exercise*-2nd Edition. Champaign, IL: Human Kinetics; 2005.
2. Gordon E. Robertson, Graham Caldwell, Joseph Hamill, Gary Kamen, Sandy Whittlesey. Research Methods in Biomechanics. Champaign, IL: Human Kinetics; 2004.
3. Joseph Hamill, Kathleen M. Knutzen. *Biomechanical Basis of Human Movement*. USA: Wiliams & Wilkins; 1998.

Number active classes	Theory: 4	Practice: 0

Course delivery methods

Lectures, work in small groups, work in the laboratory.

Knowledge assessment (maximum number of points 100)

Class Activity: 20
Seminar: 40
Written Exam: 20
Oral Exam: 20

Testing ways may vary: (written exams, oral exams, project presentations, seminars, etc. .....)

*maximum length 1 A4 page