

# **Doctoral School on Safety and Security Sciences – Óbuda University**

**Course title:** Motion analyses in biomechanics

To which area the course belongs: **Applied research**

**Credit value of the course:** 6 credits

**Lecturer:** István Bíró

## **The aim of the course:**

The aim of the course is the better understanding of the biomechanics of human motion in sports and rehabilitation. This investigation can be solved by application of different motion capture system. A variety of motion analysis capture methods such as optical, electromagnetic and image-based techniques can be used. Reported positional data of segment points can be applied to calculate various kinematic and kinetic parameters. These parameters are suitable to quantify and experimentally validate different motion patterns.

**Prerequisite:** -

## **Content of the course:**

Review and analytical evaluation of different motion testing methods, writing a comparative study on the evaluation of motion testing methods, performing and evaluating specific motion test measurements.

## **Recommended reading:**

Roger Bartlett: Introduction to Sports Biomechanics. Analyzing Human Movement Patterns. 2<sup>nd</sup> Edition, Taylor & Francis e-Library, 2007, ISBN 0-203-46202-5

Duane Knudson: Fundamentals of Biomechanics, 2<sup>nd</sup> Edition, Springer, 2007, ISBN 978-0-387-49311-4

Bíró István, Fekete Gusztáv: Approximate Method for Determining the Axis of Finite Rotation of Human Knee Joint, ACTA POLYTECHNICA HUNGARICA 11:(9) pp. 61-74. (2014)

G Fekete, B M Csizmadia, M A Wahab, P Baets, L Vanegas-Useche, I Biro: Patellofemoral Model of the Knee Joint Under Nonstandard Squatting, DYNA-COLOMBIA 81:(183) pp. 60-67. (2014)

István Bíró, Béla M. Csizmadia, Gábor Katona: Sensitivity investigation of three-cylinder model of human knee joint, BIOMECHANICA HUNGARICA 3:(1) pp. 33-42. (2010)