Course title: Computerized Measuring Systems	Neptun code: GEVEE412-a

Course coordinator: Dr. Dávid Matusz-Kalász, PhD, assistant lecturer

type of lesson and number of lessons: **lecture (2)**

method of evaluation: colloquium

curriculum location of the subject: (autumn/spring semester): autumn and spring

pre-study conditions *(if any)*: -

The task and purpose of the subject:

The aim of the course is to get acquainted with the theory of intelligent measuring systems and measurement methods, to learn the design steps and practice of hardware architecture, and to acquire on-line and off-line measurement control software development knowledge.

Course description:

Theoretical knowledge of computer-controlled measuring systems and practical knowledge at the system integrator level. Digital measurement methods. Fundamental issues of digital data processing. DMM. Structure and characteristics of computerized measurement systems. Multiplexed and simultaneous samplers. Sampling law, quantization rules, sampling and conversion frequency. Sensors, converters, their types, characteristics and areas of use. Analog signal conditioners, D/A and A/D converters. Characteristics of multifunctional measurement data collectors, analog input, analog output, digital inputs and outputs, counter timer. Characteristics of analog input application, sampling methods, triggered sampling. Practical application of control and signal processing software, basic software services. Application of analog inputs and outputs. Frequency analysis and statistical analysis of sampled signals.

Required literature:

1. J.G. Webster: The Measurement, Instrumentation and SensorsHandbook, 1998. CRC Press

2. Doebelin: Measurement Systems, McGraw-HillPubl. 1990.

3. Bolton: Measurement and Instrumentation Systems, Newnes, 1996.

Recommended literature:

1. Szabó N. handbook www.electro.uni-miskolc.hu/~elkszabo

2. Alexander W. Koch: Measurement and Sensor Systems. Springer, 2023.

3. Data AcquisitionHandbook, MeasurementComputing Corporation, 2012. ThirdEdition.
    http://www.mccdaq.com/pdfs/anpdf/Data-Acquisition-Handbook.pdf