**Name of the course:** Microprocessor systems development methods and tools

**Department responsible for the course or** **equivalent:** Dpt. Information Measuring Technologies & Systems, Institute of Nanotechnologies, electronics and electronic equipment engineering

**Lecturer (name, academic title, e-mail):** Dr. Yulia Klunnikova, associate professor, yvklunnikova@sfedu.ru

**Semester when the course unit is delivered**: 7

**Teaching hours per week**: 6

**Level of course unit**: Bachelor level

**ECTS credits:** 6

**Admission requirements**: Course « Microprocessor systems development methods and tools» requires the basic knowledge of digital and analogue circuit technology, microprocessor technology.

**Course aims**: To obtain theoretical and practical knowledge and insight in microprocessor systems development.

The « Microprocessor systems development methods and tools » course is taught in the 7th semester of Bachelor’s program.

**Course contents**:

The course is comprised of 4 units. The course ends with a creative project worked by the students individually with guidance from the lecturer.

Unit 1: Microprocessors and microcontrollers.

Arithmetic & logic unit. RAM. ROM. Input-output ports. ADC.Timers. Interrupts. Instruction set. DSP microprocessors. Cross assembler.

Unit 2: LabVIEW & Multisim development tools.

Multisim MCU module. LabVIEW DSP module. Multisim & LabVIEW co-simulation.

Unit 3: Measurement microprocessor systems development.

Data acquisition systems development. Measurement systems development. Data compression systems development.

Unit 4: Microprocessor systems testing and fault diagnosis.

Microprocessor, RAM, ROM, Multiplexer, ADC, DAC and input-output ports testing. Logic analyzers. Signature analyzers.

**Learning outcomes**: Students will give an oral presentation in area of measurement microprocessor system development.

**Planned learning activities and teaching methods:** Lectures, Lab Sessions and Project Work.

**Assessment methods and criteria**

Assignments for this course consists of: a midterm and final exams, project & an end of term presentation.

1. In Class Mid term Exam 20%

2. Project & presentation in class 50%

3. Final Exam 30%

**Course literature (recommended or required):**

1. Ferguson J., Macari L., Williams P. Microprocessor system servicing. Prentice/Hall International.
2. Levoniuk S. Laboratory microcontrollers based on the MULTISIM MCU module. LAP LAMBERT Academic Publishing.
3. Multisim User Guide. National Instruments Corporation.
4. NI SPEEDY-33 User Manual. National Instruments Corporation.