

<b>Study program: Information Technology</b>				
<b>Course title: INFORMATION TECHNOLOGY IN SENSOR SYSTEMS</b>				
<b>Teacher(s): Nebojša S. Mitrović</b>				
<b>Course status: elective</b>				
<b>Number of ECTS credits: 6</b>				
<b>Prerequisite courses: none</b>				
<b>Course objectives</b> Introduction to sensors and sensor systems, as well as the possibilities of their integration into monitoring systems using information technologies.				
<b>Learning outcomes</b> Acquiring the knowledge needed to create systems that, through the application of computer and information technologies, enable the satisfaction of the spectrum of information needs of an individual or organization, whereby sensor systems are sources of targeted information.				
<b>Content of the course</b> <i>Theoretical teaching</i> Introduction to Sensorics. Classification of sensors. Physical fundamentals of sensors. Structure and technical characteristics of sensors, and microsensors. Intelligent sensors: definition and examples. Embedded systems. Sensor data acquisition, processing, and transmission. Application of the Raspberry Pi computer. Development of Python applications for collecting sensor data and managing smart environments. Monitoring, analysis, and storage of data using data loggers. Design and implementation of smart environment monitoring applications. <i>Practical teaching</i> It is realized through the creation of project tasks based on real needs, where sensors and sensor systems represent the interface between information technologies and the real world. Sensor systems integrated with information technologies are designed to work following defined needs, to be reliable and safe, and to be improved, upgraded, and efficiently maintained.				
<b>Literature</b> [1] N. Mitrović, "Senzori-fizički principi i primene", WUS Austria, TF Čačak, 2005. [2] N. Mitrović, "Monitoring i vizuelizacija procesa", WUS Austria, TF Čačak, 2009. [3] M. A. Mazidi, S. Naimi, S. Naimi, "The AVR Microcontroller and Embedded Systems Using Assembly and C", Pearson Education, Inc. Second Ed. 2017. [4] B. van Dam, Raspberry PI, "Istražite -RPi kroz 45 elektronskih projekata", Infoelektronika, 2015. [5] J. Orelj, N. Mitrović, "Praktikum - Informacione tehnologije u senzorskim sistemima", Fakultet tehničkih nauka Čačak, 2018. [6] G. Guillen, "Sensor Projects with Raspberry Pi" Apress, 2019. [7] User Guide for EasySense VISION Data Harvest Remote Data Logger <a href="https://store.data-harvest.co.uk/v-log">https://store.data-harvest.co.uk/v-log</a>				
<b>Number of active teaching classes: 4</b>		<b>Theoretical teaching: 2</b>	<b>Practical teaching: 2</b>	
<b>Teaching methods</b> Lectures, exercises, consultations, and practical work in the laboratory. Parts of the material that can be combined into logical units can be taken during the semester through a colloquium and in the form of seminars.				
<b>Evaluation of knowledge (maximum number of points 100)</b>				
<b>Pre-exam obligations</b>		<b>Points</b>	<b>Final exam</b>	<b>Points</b>
Activities during the teaching process		5	Final exam (written):	20
Practical teaching		15	Final exam (oral):	30
Colloquium		15		
Seminars		15		