UNIVERSITY "UKSHIN HOTI" PRIZREN
FACULTY OF COMPUTER SCIENCE

PROGRAM: Information Technology and Telecommunication

SYLLABUS

Level of studies		Bachelor	***Program***	TIT	***Academic year***	2018/2019	
SUBJECT		Sensors and Interfaces					
Year	**1st**	***Status Of the subject***	Obligatory	***Code***		***ECTS credits***	6
Semester	II						
Teaching weeks		15	***Hours teaching***	60	***Lectures***	***Exercises***	
					2	2	
Teaching Methodology		**Lectures, exercices, seminar papers, consultations, etc.**					
Consultations		**1 hr / week**					
Professor		**Prof. Ass. Dr. Arsim Susuri**	***E-mail:***	**arsim.susuri@uni-prizren.com**			
			Tel.:				
Assistant		**Ass. Agon koka, Dr. Techn.**	***E-mail:***	**agon.koka@gmail.com**			
			Tel.:				

Study goal and table of content	**Benefits of student**
The course objective is to provide students with basic knowledge about the different principles of using sensors. Understanding how different types of sensors can be used to improve a particular application and how they can be used to create a useful product	Upon completion of this course the student will be able to: • Explain the art of using sensors (sensors, position of sensor measurement, speed, etc.) • Provide data obtained from sensors • Define practical problems for the implementation of a product consisting of sensors and hardware modules.

Methodology for the implementation of educational topics:		
The course is a combination of lectures, discussions, discussions, numerical and laboratory exercises, the tasks are presented by the subject professor and assistant in the lab.		
Conditions for realization of educational topics:		
Adequate literature, tables, computers, projectors, Arduino boards and other IT tools for learning and exercises.		
Ways of assessing of the student (in %) :	**Evaluation in%**	**Final grade**
Project/laboratory	20.00 %	51-60% - grade 6 61-70 7 71-80 8 81-90 9 91-100 10
Test 1	40.00 %	
Test 2	40.00 %	
Or		
Total	**100.00 %**	
Obligations of student:		

Lectures	Exercises
The student should be regular in lectures and especially in exercises, make use of all learning opportunities, use compulsory and broader literature, be active and respect the rules on high school ethics in courtesy and cooperation.	The student should be active in the exercises and reflect the readiness and knowledge of initiatives, ideas and demonstrations of the knowledge acquired in the lectures.

Activities	Hour/ weeks	Days/Weeks	Total
Lectures	2	15	30
Laboratory exercises	2	15	30
Contacts with teachers / consultations	1	5	5
Practical work	1	2	2
Projects, presentations, etc.	1	2	2
Own study time	3	15	45
Preparation for final exam	5	6	30
Time spent in the assessment (tests, final exam, etc.)	2	3	6
Notice: 1 ECTS credits= 25 hour commitment, e.g. if the subject has 6 ECTS credits student must have 150 hours during the semester commitment.		**Total load:**	**150**

Week	Lectures Topic	Hour	Exercises Topic	
1	• **Presentation of the syllabus** • Introduction • Definitions, classification of sensors and actuators	2	• **Numerical exercises from chapter 1** **1.1, 1.2, 1.9 (literature 1)**	2
2	• **Performance features of sensors and actuators**	2	• **Numerical exercises from chapter 2** **2.3, 2.4 (literature 1)**	2
3	• **Temperature sensors** • Thermoresistive sensors, thermolelectric sensors, optical and acoustic temperature sensors	2	• **Numerical exercises from chapter 3** **3.1, 3.2, 3.9 (literature 1)**	2
4	• **Optical sensors and actuators -** • Photoelectric sensors • Optical actuators	2	• **Numerical exercises from chapter 4** **4.1, 4.2 (literature 1)**	2
5	• **Magnetic sensors and actuators -** • Mgnetostrictive sensors and actuators	2	• **Numerical exercises from chapter 4 and 6** **4.3, 6.1, (literature 1)**	2
6	• **Magnetometers -** • Voltage and current sensors	2	• **Numerical exercises from chapter 6** **6.2, 6.3 (literature 1)**	2
7	**Test 1**	2	• **Repetition of exercises** • **Reinforcement for the test 1**	2
8	• **Optical sensors and actuators -** ○ Force sensors ○ Accelerometers ○ Inertion sensors - gyroscope	2	• **Project 1** https://learn.sparkfun.com/tutorials/sik-experiment-guide-for-arduino---v32/introduction-sik-arduino-uno	2
9	• **Acoustic sensors and actuators** • Microphones, acoustic actuators	2	• **Project 2** https://learn.sparkfun.com/tutorials/sik-experiment-guide-for-arduino---v32/experiment-1-blinking-an-led	2
10	**Chemical sensors and actuators** Thermochemical sensors	2	• **Project 3** https://learn.sparkfun.com/tutorials/sik-experiment-guide-for-arduino---	2

			v32/experiment-2-reading-a-potentiometer	
11	**Radiation sensors and actuators** Antennas as sensors and actuators	2	• **Project 4** (https://learn.sparkfun.com/tutorials/sik-experiment-guide-for-arduino---v32/experiment-3-driving-an-rgb-led)	2
12	**MEMS sensors and actuators** Smart sensors and actuators	2	• **Project 5** https://learn.sparkfun.com/tutorials/sik-experiment-guide-for-arduino---v32/experiment-5-push-buttons	2
13	**Interfacing methods and circuits** A/D and D/A converters	2	• **Project 6** https://learn.sparkfun.com/tutorials/sik-experiment-guide-for-arduino---v32/experiment-7-reading-a-temperature-sensor	2
14	**Microprocessor interface** Microprocessor as a general controler	2	• **Project 7** https://learn.sparkfun.com/tutorials/sik-experiment-guide-for-arduino---v32/experiment-12-driving-a-motor	
15	**Test 2**	2	• **Repetition of exercises** • **Reinforcement for the test 2**	

LITERATURE:

Main Literature:

1. Nathan Ida – Sensors, Actuators, and their Interfaces – A Multidisciplinary Introduction, SciTech Publishing, Edison, NJ, 2014.
2. W. Bolton – Mechatronics – Electronic Control Systems in Mechanical and Electrical Engineering, 3rd Edition, Pearson, Prentice Hall, 2003.

Additional literature:

1. J. Fraden, - AIP Handbook of Modern Sensors, Physics, Designs and Applications, American Institute of Physics.

NOTICE:

In general, lecture presentations will be made through the PowerPoint system, the table, the use of materials and software and the Internet.
• Also additional resources (scientific papers, publications, national bulletins, and recent discoveries and research) will be provided by the professor.
• In the absence of the opportunity for practical work to be organized weekly, in cooperation with the University's management, this activity will be organized on certain days in: organizations, companies, ltd, farms, manufacturing units.
• During each session, dialogue and co-participation will be organized with the students.

Notice for the student:

Students are required to be regular in the lectures and exercises section.
The contribution of students in the form of conversation and cooperation with students will be evaluated.
Timely arrival in lectures and exercises is mandatory.