UNIVERSITY OF PRIZREN
FACULTY OF COMPUTER SCIENCE

PROGRAM: TIT - BOS

Curriculum - – SYLLABUS						
Level of studies	Bachelor		*Program*	TIT-Bos	*Academic year*	2018/2019
SUBJECT	Microcontrollers					
Year / **I**	*Status Of the subject*		Obligatory	*Code*	*ECTS credits*	6
Semester / IV						
Teaching weeks	15		*Hours teaching*		Lectures: 2	Exercises: 2
Teaching Methodology	**Lectures, exercises, consultations, tests, case studies**					
Consultation	**1 hour a week**					
The teacher	Fadil Novalić		*E-mail:* fadilnovalic@gmail.com			
			Tel.: + 381 69 232 89 56			
Assistant	**Musa Murati**		*E-mail:* murati.musa@gmail.com			
			Tel.: + 377 45 425 718			

Study goal and table of content	Benefits of student
Students should be familiar with the meaning of the term Microprocessors, as well as their application. Students will learn about the structure of the microcontroller and the way they function. They will learn to program microcontrollers. Examines examples of microcontroller application.	After the course, it is expected that each student can: Explain how the microcontroller works. Provide examples of using a microcontroller. Write simple programs for managing the operation of the microcontroller. Maintain micronutors. Develop project and technical documentation for microcontroller.

Methodology for the implementation of educational topics:
Learning outcomes are achieved through a combination of lectures, supervised practical work and independent study/practice. PowerPoint presentations are used in lectures. Practical application of sensors and interface programming are realized at the exercises.

Conditions for realization of educational topics:
- Classroom equipped with computer and projector;
- Computer laboratory with Internet connection

Ways of assessing of the student (in %) :	Evaluation in%	Final grade
	0-50	5 (five)
	51-60	6 (six)
	61-70	7 (seven)
• **50% from 2 Lab. Projects**	71-80	8 (eight)
• **50% Final exam**	81-90	9 (nine)
	91-100	10 (ten)
	0-50	5 (five)
Total	**100.00 %**	

Obligations of student:

Lectures	Exercises
74	76

Activities	Hour/ weeks	Days/Weeks	
Lectures	2	15	30
Laboratory exercises	2	15	30
Contacts with teachers / consultations	1	15	15
Practical work	2	5	10
Projects, presentations, etc.	0,5	10	5
Own study time	3	14	42
Preparation for final exam	2	6	12
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	Hour	Exercises	Hour
	Topic		**Topic**	
1	DEFINITIONS AND BASIC CONCEPTS - Basic concepts of process management, - Software - basic terms - What is PLC? Literature: Marinković, D. (2018). Programabilni logički kontroleri. Beograd: Mikro knjiga.	2	The exercises are followed by topics covered in lectures, with the writing of programs for microcontrollers. Literature: Radetić, R. (2004). *Programski jezik C za PIC mikrokontrolere*. Beograd: Agencija EHO. Web sources	2
2	DEFINITIONS AND BASIC CONCEPTS - PLC mode - Scen cycle - Place and role of PLC in modern control systems - Distributed control system (DCS) Literature: Marinković, D. (2018). Programabilni logički kontroleri. Beograd: Mikro knjiga.	2	The exercises are followed by topics covered in lectures, with the writing of programs for microcontrollers. Literature: Radetić, R. (2004). *Programski jezik C za PIC mikrokontrolere*. Beograd: Agencija EHO. Web sources	2
3	Hardware structure of the PLC - Processor module - Memory - Input / output (I / O) modules - Special, functional and technological modules Literature: Marinković, D. (2018). Programabilni logički kontroleri. Beograd: Mikro knjiga.	2	The exercises are followed by topics covered in lectures, with the writing of programs for microcontrollers. Literature: Radetić, R. (2004). *Programski jezik C za PIC mikrokontrolere*. Beograd: Agencija EHO. Web sources	2
4	Hardware structure of the PLC - Communication interface - Distributed peripherals - Redundant systems - Configure hardware - configurators Literature: Marinković, D. (2018). Programabilni logički kontroleri. Beograd: Mikro knjiga.	2	The exercises are followed by topics covered in lectures, with the writing of programs for microcontrollers. Literature: Radetić, R. (2004). *Programski jezik C za PIC mikrokontrolere*. Beograd: Agencija EHO. Web sources	2
5	INSTALLATION AND WIRING OF THE PLC - PLC installation - PLC wiring Literature: Marinković, D. (2018). Programabilni logički kontroleri. Beograd: Mikro knjiga.	2	The exercises are followed by topics covered in lectures, with the writing of programs for microcontrollers. Literature: Radetić, R. (2004). *Programski jezik C za PIC mikrokontrolere*. Beograd: Agencija EHO. Web sources	2
6	PROGRAMMING PLC - Programming PLC - Program languages for PLCs Literature: Marinković, D. (2018). Programabilni logički kontroleri. Beograd: Mikro knjiga.	2	The exercises are followed by topics covered in lectures, with the writing of programs for microcontrollers. Literature: Radetić, R. (2004). *Programski jezik C za PIC mikrokontrolere*. Beograd: Agencija EHO. Web sources	2

7	PROGRAMMING PLC - Ladder diagram - Repertoire command Literature: Marinković, D. (2018). Programabilni logički kontroleri. Beograd: Mikro knjiga.	2	The exercises are followed by topics covered in lectures, with the writing of programs for microcontrollers. Literature: Radetić, R. (2004). *Programski jezik C za PIC mikrokontrolere*. Beograd: Agencija EHO. Web sources	2
8	PROGRAMMING PLC - Interrupt - Subprograms Literature: Marinković, D. (2018). Programabilni logički kontroleri. Beograd: Mikro knjiga.	2	Colloquium I	2
9	EXAMPLES - First steps - a new project - Defining the hardware configuration Literature: Marinković, D. (2018). Programabilni logički kontroleri. Beograd: Mikro knjiga.	2	The exercises are followed by topics covered in lectures, with the writing of programs for microcontrollers. Literature: Radetić, R. (2004). *Programski jezik C za PIC mikrokontrolere*. Beograd: Agencija EHO. Web sources	2
10	EXAMPLES - Communication pc-plc, IP address setting - Programs with one-bit commands Literature: Marinković, D. (2018). Programabilni logički kontroleri. Beograd: Mikro knjiga.	2	The exercises are followed by topics covered in lectures, with the writing of programs for microcontrollers. Literature: Radetić, R. (2004). *Programski jezik C za PIC mikrokontrolere*. Beograd: Agencija EHO. Web sources	2
11	EXAMPLES - Motor control with PLC - Temperature control - Measuring the weight Literature: Marinković, D. (2018). Programabilni logički kontroleri. Beograd: Mikro knjiga.	2	The exercises are followed by topics covered in lectures, with the writing of programs for microcontrollers. Literature: Radetić, R. (2004). *Programski jezik C za PIC mikrokontrolere*. Beograd: Agencija EHO. Web sources	2
12	EXAMPLES - HMI - Web server applications Literature: Marinković, D. (2018). Programabilni logički kontroleri. Beograd: Mikro knjiga.	2	The exercises are followed by topics covered in lectures, with the writing of programs for microcontrollers. Literature: Radetić, R. (2004). *Programski jezik C za PIC mikrokontrolere*. Beograd: Agencija EHO. Web sources	2
13	DIAGNOSIS AND MAINTENANCE - Diagnostics and maintenance - Remote maintenance Literature: Marinković, D. (2018). Programabilni logički kontroleri. Beograd: Mikro knjiga.	2	The exercises are followed by topics covered in lectures, with the writing of programs for microcontrollers. Literature: Radetić, R. (2004). *Programski jezik C za PIC mikrokontrolere*. Beograd: Agencija EHO. Web sources	2
14	Design of Project and Technical Documentation Literature: Marinković, D. (2018). Programabilni logički kontroleri. Beograd: Mikro knjiga.	2	The exercises are followed by topics covered in lectures. Literature: Radetić, R. (2004). *Programski jezik C za PIC mikrokontrolere*. Beograd: Agencija EHO. Web sources	2
15	Presentation of seminar papers by students	2	Colloquium II	2

LITERATURE:

1. Marinković, D. (2018). *Programabilni logički kontroleri*. Beograd: Mikro knjiga.
2. Radetić, R. (2004). *Programski jezik C za PIC mikrokontrolere*. Beograd: Agencija EHO.
3. E-document "Programiranje mikrokontrolera", preuzeto sa http://download.tutoriali.org/Tutorials/Programiranje/programiranje_mikrokontrolera.pdf

NOTICE:

Students will receive instructional material in the Bosnian language for each topic. Lectures and exercises will also be in Bosnian language. PowerPoint presentations will be used for lectures

Notice for the student:

Students are required to attend lectures and exercises, to participate in project and practical tasks and to come atregular consultations. This will enable them to easily master teaching materials and achieve a high level of knowledge.