

<b>Course title:</b>		<b>Microcontroller system design</b>		
<b>Course code</b>	<b>Course status</b>	<b>Semester</b>	<b>Number of ECTS credits</b>	<b>Lecture hours</b>
<b>PA1201</b>	<b>Obavezan</b>	<b>II</b>	<b>5</b>	<b>2P+2V</b>

**Study program:**

Graduate academic studies, ELECTRICAL ENGINEERING, study program: Electronics, Telecommunications and Computer engineering (studies last for 4 semesters, 120 ECTS credits).

**Prerequisites:**

No prerequisites required.

**Course aims:**

Microcontrollers are computers in a chip. Students will be introduced with the architecture of a microcontroller. The goal is to introduce with the tools used to write programs, compiling and translating in the machine language and placing in the chip.

**Teacher(s) first and last names:** Prof. dr. Zoran Mijanović - nastavnik, dr. Nedeljko Lekić, dipl.ing. Milena Zogović i dipl.ing. Milena Jovanović - saradnici

**Studying method:**

Lectures, exercises, laboratory exercises, individual work on practical tasks, consultations.

**Course synopsis:**

Preliminary week	Preparation and semester enrolment.
I week	Introduction; course description, goal and methodology of work; Architecture of microcontrollers; Configuration; Ports, DDR, PIN; Alternative functions; Serial interfaces: UART, SPI, TWI; Analog inputs; <i>I colloquium;</i> <b>Free week</b> Interrupts: principle, software support; Timers -counters; Analog outputs - PWM; Analog comparator; <i>II colloquium;</i> Capacitance based sensor; LCD moduo; LED display with multiplex; ISP; Bootloader <i>Final exam</i>
II week	
III week	
IV week	
V week	
VI week	
VII week	
VIII week	
IX week	
X week	
XI week	
XII week	
XIII week	
XIV week	
XV week	
XVI week	
Final week	Administrative procedures.
Additional lessons, correction of the final exam and administrative procedures.	

**STUDENT WORKLOAD**

<u>per week</u>	<u>per semester</u>
<b>5 credits x 40/30 = 6 h and 40 min</b> <b>Working hours structure:</b> 2 h lectures 2 h exercises 2 h and 40 min for individual work including consultations	<b>Teaching and the final exam:</b> (6 h 40 min) x 16 = <b>106 h 40 min</b> <b>Necessary preparation</b> (before semester): 2 x (6 h i 40 min) = <b>13 h and 20 min</b> <b>Total work hours for the course: 5x30 = 150 h</b> <b>Additional hours</b> for preparing correction of the final exam, including the exam taking: up to 30hours. <b>Working hours structure:</b> 106 h and 40 min. (Lectures)+13 h and 20 min. (Preparation)+30 h (Additional work)

Lessons attendance is mandatory for students, as well as doing homeworks and colloquiums, etc.

**Literature:**

»AtMega16 complete doc2466.pdf«, Atmel corp., [www.atmel.com](http://www.atmel.com)  
 lecture notes, Z. Mijanović,  
[http://www.elektronika.cg.yu/root/mikrokontroleri/predavanja/projektovanje\\_mikrokontrolerskih.htm](http://www.elektronika.cg.yu/root/mikrokontroleri/predavanja/projektovanje_mikrokontrolerskih.htm)  
 Additional literaturena [www.elektronika.cg.yu](http://www.elektronika.cg.yu)

**Oblici provjere znanja i ocjenjivanje:**

- 5 homeworks - 5 points,
- Project - 5 points,
- 2 colloquiums - 20 points each (40 points in total),
- Final exam 50 points.
- Student gets the passing grade by collecting 51 points at least.

**Special remarks for the course** : If needed, the course can also be taught in English.

**Teacher(s) who provided the information:** Prof. dr. Zoran Mijanović