SYLLABUS

1. Course title:

Process computer technology

2. Code:

(max. 20 characters)

3. Cycle of study:

1

4. ECTS credits:

4

5. Type of course:

(•) Mandatory ( ) Elective

6. Prerequisites:

(max. 110 characters)

7. Class restrictions:

(max. 150 characters)

8. Duration / semester:

1 8

9. Weekly contact hours:

9.1. Lectures:	2
9.2. Seminars:	0
9.3. Laboratory/Practice classes:	1

10. Faculty:

Faculty of Mechanical Engineering

11. Department/study program:

Mechatronic

12. Lecturer:

dr.sc. Elvedin Trakić, doc.

13. Lecturer's e-mail:

elvedin.trakic@untz.ba

14. Web site:

www.mf.untz.ba

15. Course aims:

To introduce students to real-time mechatronic systems (real-time system issues, classification and examples of real-time systems in mechatronic applications, ie computer control and monitoring systems with predefined reaction time). Introduce students with designing mechatronic real-time systems using the ultimate state machine through graphically based visual simulation software (Matlab / Simulink / Stateflow). Introduce students with the hardware and software aspect of the embedded real-time system by unifying the key elements of the mechatronic system.

16. Learning outcomes:

After successful completion of this course, the student will be able to: Model and design a mechatronic real-time system using a final state machine. They create and program a simpler mechatronically embedded real-time system according to the intended target functionality. Analyze and interpret the results of computer-based real-time monitoring (using graphically based visualization software) in a mechatronic application to increase the efficiency of the mechatronic system.

17. Course content:

• Real-time system problematics.
• Real Time Classification of Systems. Examples of mechatronic real-time systems.
• Designing mechatronic real-time systems using the ultimate state machine. Examples of real-time modeling using graphically based visualization simulation software (Matlab / Simulink / Stateflow)
• Hardware and software aspects of embedded real-time systems. An example of a microcontroller platform architecture. Real-time programming of built-in mechatronic systems (I / O ports programming, external interfaces, timers)
• Real time system hardware (digital inputs / outputs, analog inputs / outputs, pulse inputs / outputs, real-time clock).
• Real Time System Software. Real Time Operating System (RTOS). Process Algorithms.
• Mutually switch off the process. Communication between tasks.
• System control concept. Centralized and distributed management systems.
• SCADA Systems (Surveillance and Acquisition Systems)

18. Learning methods:

Lectures are performed in a classical manner, using multimedia resources and active learning techniques and student participation.

19. Assessment methods:

The concept of knowledge checking is based on continuous work with students during the semester. Knowledge assessment methods include: developing seminar work as well as final assessment of knowledge in written and / or oral form. This is why all students with different affinities provide equal treatment (written and / or oral knowledge).

20. Assessment components:

Assessment method:
Based on the points collected, the student is enrolled in the grade in the index. To get the student to get a signature in the index must be present at more than 70% of lectures and exercises.
Evaluation will be based on the following activities:
• Seminar paper (1 seminar) 50
• Final Exam (Oral) 50
TOTAL: 100 points

21. Required reading list:

1. R.Betz, Introduction in Real-Time Operating Systems, University of Newcastle, Australia 2001.
2. Wikander, B. Svenson: Real-Time Systems in Mechatronic Aplications, Springer Verlag, 2010.
3. Hugh Jack: „Automating Manufacturing Systems with PLC-s,

22. Web sources:

(max. 687 characters)

23. Applicable starting from the academic year:

2015/16

24. Adopted in the Faculty/Academy session:

01.06.2015