SYLLABUS

1. Course title:

AUTOMATICS AND ROBOTICS

2. Code:

not available

3. Cycle of study:

1

4. ECTS credits:

3

5. Type of course:

○ Mandatory ◉ Elective

6. Prerequisites:

Electrotechnics and Electronics; Statics; Kinematics; Dynamics; Mechanisms and Dynamics of Machines

7. Class restrictions:

8. Duration / semester:

1 7

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:

Production Mechanical Engineering

12. Lecturer:

Bahrudin Saric, associate professor

13. Lecturer's e-mail:

bahrija.saric@untz.ba

14. Web site:

www.mf.untz.ba

15. Course aims:

The main goal of the course "Industrial and Mobile Robots" is to understand the nature, function, and the role of automatic control and regulation of technical systems and application of robotic systems in modern manufacturing processes, and to master the necessary theoretical and practical skills in the field of subject studies in order to increase knowledge in the field of robotics, as well as increasing the competitive advantages of robotic systems through improvement of the efficiency of the processes and their successful integration with other segments in the manufacturing process.

16. Learning outcomes:

At the end of the semester, successful students, who continued to perform their duties throughout the academic year, will be trained to control and regulate robotic systems and to independently transform basic mechanical system into automated robotic system by implementing other elements (sensors - control system, actuators).

17. Course content:

General information about robots and application of robotic systems in modern production. Basic concepts of automatic control and regulation. The analysis of regulation systems, stability analysis of SAU (SAR) systems, control and regulation of MDS system. The structure of control system - controlling robots. Basic types of actuators and most important requirements that actuators or operators must meet. Classification and groups of internal and external sensors. Selecting strategy for controlling industrial robots (in the joints, and in working area), and control of mobile robots (hierarchical, reactive, hybrid). Programming in robotics, point to point (PTP) control, CP (continuous path) control, types of programming in robotics.

18. Learning methods:

Lectures, seminars and laboratory/practice classes, oral and written exams, term papers/practical assignments and consultations.

- Lectures - theoretical lectures, active two-way communication student - professor, student attendance is mandatory;
- Seminars - solving problems with topics related to subject matter, active two-way communication student -assistant, attendance is mandatory;
- Laboratory/practice classes - laboratory work, acquisition of practical skills related to subject matter, active two - way communication student - assistant, attendance is mandatory;
- Written exam (theoretical part and tasks);
- Term papers/practical assignments - the independent work of the student on solving the given problem;
- Consultations - clarifying any ambiguities related to the subject studies

19. Assessment methods:

Term papers/practical assignments, written exam (theoretical part and tasks), report paper from laboratory/practice classes, final exam(oral), corrective exam (oral and written).

- Term papers/practical assignments - student defends his/her work in front of the professor/assistant - gives an answer to asked questions
- Written (theoretical part and tasks) - student answers questions/tasks in a given time period related to the subject of study
- Report paper from laboratory/practice classes - submission of reports on the activities related to the realization of certain laboratory exercises, answering questions asked by the assistant
- Final Exam - oral answer to the questions asked by professors
- Corrective Exam (written) - answering questions/tasks in a given time period related to the subject of study
- Corrective Exam (oral) - oral answer to given questions

20. Assessment components:

Written exam 2 x 20 = 40 points
Term paper = 10 points
Practical exam = 30 points
Oral exam (final) = 20 points
TOTAL = 100 points

In order to pass any form of exam, student must achieve at least 50% of maximum number of points assigned for that form of exam. If student fails in achieving this, he/she must retake the exam on the official dates stated by Students Office. For a student who passes all the components of the course, the final grade will be summarized by number of points student achieved during the course. In order to get the index signed, the student must attend at least 70% of all lectures, seminars and laboratory/practise classes.

21. Required reading list:

1. Iserman, R.: "Mechatronic Systems"; Springer-Verlag, London, 2003.
2. Schiessle, E.: "Mechatronik-Sensoren"; Vogel-Buchverlag, Frankfurt, 2004.
3. Bo Hanus: "Mechatronik"; Legoprint, Lavis, 2005.
4. Heimann, B.; Gerth, W.; Popp, K.: "Mechatronik"; Fachbuchverlag, Leipzig, 2006.
5. Werner, R.: "Einfuhrung in die Mechatronik"; Fachvelage, Wiesbaden, 2006.
6. Dolecek, V.; Karabegovic, I.: "Robotika"; Tehnicki fakultet Bihac, Bihac, 2002.
7. Saric, B.: "Automatika i robotika - predavanja"; Tuzla, 2014/15.

22. Web sources:

23. Applicable starting from the academic year:

2015/2016

24. Adopted in the Faculty/Academy session: