SYLLABUS

1. Course title:

NEURAL NETWORKS

2. Code:

not available

3. Cycle of study:

1

4. ECTS credits:

3

5. Type of course:

○ Mandatory ◉ Elective

6. Prerequisites:

Fundamentals of Mechatronics; Automatic Control; Electrotechnics and Electronics; Computers and Programming

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:

Mechatronics

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 "Neural Networks" is application of neural networks in control processes of mechatronic systems, more precisely robotics. This course has the purpose of teaching necessary theoretical and practical skills in order to enhance application of artificial intelligence in field of control and regulation of mechatronic systems which will increase the competitive advantages of mechatronic systems.

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 understand all the possibilities artificial intelligence and neural networks algorithm offer in field of control and regulation of mechatronics systems.

17. Course content:

Basic concepts of artificial intelligence and neural networks. Application of artificial neural networks in control processes of mechatronic systems. Basic features and structure of neural networks. Types of neural networks and neural networks learning process. Similarities between human brain function and neural networks. Implementation of neural networks.

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. Arzberger, P.; Wolfgang, E.: "Fachtheorie Mechatronik"; Bildungsverlag, Troisdorf, 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. Saric, B.: "Neuronske mreze: predavanja"; Tuzla, 2015.

22. Web sources:

23. Applicable starting from the academic year:

2015/2016

24. Adopted in the Faculty/Academy session: