Study program: Industrial Engineering

Course title: Management of Integrated Systems

Professor/assistant: PhD Miloš S. Ristić

Type of course: elective

ECTS credits: 5

Pre-requisites: -

Aims of the course:

Preparing a student to:

- adopt core concepts in the field of sensors, controllers, control systems, intelligent control systems, adaptive control systems, manipulators and robots;
- learn which the main components of modern management systems are and what inter-relationships and levels of correlation existamong them;
- assess the need for introducing a management system into a certain technical and technological process;
- recognize practical problems in operation of the management systems and apply the acquired knowledge in solving them.

Learning outcomes:

The student is able to:

- identify the input and output parameters of the implemented management system;
- recognize problems in the operation of the existing management systems and improve their operation;
- identify the need for implementing an appropriate part or a complete management system in a specific technical-technological process;
- apply the existing or independently developed solutions to optimize the operation of the appropriate system.

Syllabus

Theoretical part

The basics and structure of the management system. Analysis of the influence of environment and development on the integration and implementation of the management system in different technical-technological processes. Components of different types of management systems. Creating new management systems according to need. Application of the management system in various fields of engineering. Principles of automation and robotics. The basics and structure of manipulators and robots. Analysis of the components of robotic systems. Control and control levels in robotic applications with practical examples. Development and implementation of automation and robotics systems in industry.

Practical part

Realization of practical management systems through individual project tasks, by using appropriate software and equipment.

Literature

1. Vukobratović, M. i dr., *Uvod u robotiku*, M. Pupin, Beograd, 1996.
2. Potkonjak, V., *Robotika*, Beograd, 1989.
3. Nikolić, V. i dr., *Automatsko upravljanje:analiza sistema*, Mašinski fakultet, 1996, Niš.
4. Adamović, Ž. i dr., *Robotizovane mašine i roboti*, DTD Tehdis, Beograd, 2009.
5. Berković, I., *Elementi veštačke inteligencije-kroz primere i zadatke*, Univ. Novi Sad, Zrenjanin, 1999.
6. Stefanović, S. i dr., *Automatizacija*, DTD Tehdis, Beograd, 2007.

Number of active classes			Other forms of teaching:
Lectures: 3	Practical classes: 2	Research work:	

Teaching methods Lectures are performed with combined and interactive methods and audio-visual presentations. Excerpts are performed using audio-video presentations, and appropriate modern equipment is used for solutionsto concrete practical examples. Consultations are held in order to further clarify the teaching material.

Grading system (maximum 100 points), **grading scale**from 5 to 10: below 51 points grade 5, grade 6 from 51-60 points, grade7 from 61-70 points, grade8 from 71-80 points, grade 9 from 81-90 points, grade 10 from 91-100 points.

Pre-exam obligations	**points**	**Final exam**	**points**
activity during theoretical lectures	**10**	written exam	**30**
practical training		oral exam	
colloquium(s)/seminar papers	**30+30**		
Sum	**70**	**Sum**	**30**