POZNAN UNIVERSITY OF TECHNOLOGY

EUROPEAN CREDIT TRANSFER AND ACCUMULATION SYSTEM (ECTS)

pl. M. Skłodowskiej-Curie 5, 60-965 Poznań

COURSE DESCRIPTION CARD - SYLLABUS

Course name

IFlexible manufacturing systems

Course

Field of study	Year/Semester
Automatic Control and Robotics	4/7

Area of study (specialization)	Profile of study
	general academic

Level of study	Course offered in
First-cycle studies	English

Form of study	Requirements
full-time	elective

Number of hours

Lecture	Laboratory classes	Other (e.g. online)
15	30	
Tutorials	Projects/seminars	

Number of credit points

3

Lecturers

Responsible for the course/lecturer:

dr hab. inż. Piotr Skrzypczyński

email: piotr.skrzypczynski@put.poznan.pl

tel. 061 6652198

Institute of Robotics and Machine Intelligence

ul. Piotrowo 3A 60-965 Poznań

Responsible for the course/lecturer:

Prerequisites

Student starting this course should have knowledge of the basics of programming, architecture of computer systems and operating systems, basics of automation, linear algebra. He should also have the ability to obtain information from the indicated sources.

Course objective

The aim of the course is to understand the problems of production management and control in automated systems and methods for the design and implementation of industrial automation systems. Getting to know the methods of modeling, design and optimization of automated workstations and production lines, and especially computers integrated production systems

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Course-related learning outcomes

Knowledge

1. Has knowledge of the basic concepts and methods of flexible manufacturing

2. Knows what methods and algorithms re applied in modelling and control of manufacturing systems.

3. Has knowledge of selected methods and tools for simulation and modelling of FMS.

Skills

1. Can choose effective methods and tools for modelling and simulation of FMS.

2. Can implement simulations and analysis of simple FMS.

Social competences

1. Competent in presenting FMS solutions to general audience.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: written exam (checking theoretical knowledge) in the field of lectures: concepts, methods, algorithms.

Laboratories: checking practical skills in the field of implementation of selected methods introduced during the lecture, evaluation of reports.

Programme content

Lecture. Automation of production processes --- discrete automation concepts, organizational preparation of production, design, operation and evaluation of performance. Production planning and scheduling. Modeling of production systems --- queuing theory, optimization methods, computer simulations. Petri nets --- theoretical and application. Concurrent processes and synthesis of control algorithms. Computer integrated manufacturing and design of flexible manufacturing systems.

Laboratory. Studies review on selected topics of analysis of production systems and flexible automation equipment. Simulations of some aspects of the systems, production lines and stations.

Teaching methods

1. Lecture: multimedia presentation, illustrated with examples

2. Laboratory exercises: carrying out the tasks given by the teacher - practical exercises

Bibliography

Basic

1. Z. Banaszak, L. Jampolski, Komputerowo wspomagane modelowanie ESP, WNT, 1991.

2. J. Honczarenko, Elastyczna automatyzacja wytwarzania, WNT, 2000

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3. J. Gawlik, J. Plichta, A. Świć, Procesy produkcyjne, PWE, Warszawa, 2013

Additional

. S. Lis, K. Santarek, S. Strzelczak, Organizacja elastycznych systemów produkcyjnych, PWN, 1994

2. M. Chlebus, Techniki komputerowe CAx w inzynierii produkcji, WNT, 2000

3. M. Syslo, N. Deo, S. Kowalik, Algorytmy optymalizacji dyskretnej z programami w jezyku Pascal, PWN, Warszawa, 2001

Breakdown of average student's workload

	Hours	ECTS
Total workload	70	0,3
Classes requiring direct contact with the teacher	-451530	2
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) [1]	25	0,1

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[1] delete or add other activities as appropriate