COURSE DESCRIPTION CARD - SYLLABUS

Course name
Control of production and technical resources [N2ZiIP2-STPR>NPiZT]

Course

Field of study
Management and Production Engineering

Year/Semester
2/4

Area of study (specialization)
Production control

Profile of study
general academic

Level of study
second-cycle

Course offered in
Polish

Form of study
part-time

Requirements
compulsory

Number of hours

Lecture
8

Laboratory classes
24

Other (e.g. online)
0

Tutorials
0

Projects/seminars
0

Number of credit points

5,00

Coordinators

dr inż. Krzysztof Żywicki
krzysztof.zywicki@put.poznan.pl

Lecturers

Prerequisites

The student has basic knowledge of production management. Has knowledge of the control and control of manufacturing processes. Has basic knowledge of the architecture of computer systems and computer-aided engineering works.

Course objective

Learning, understanding and acquiring the ability to apply in practice the principles and tools for supervising production and maintaining technical resources in the implementation of production processes.

Course-related learning outcomes

Knowledge:
The student has structured, theoretically based, detailed knowledge related to the organization of production processes
The student has extended knowledge of designing production systems
The student has theoretically based, detailed knowledge of enterprise management and production processes
The student has structured, theoretically based knowledge of trends in improving the organization of

control and supervision of production processes

Skills:
The student is able to organize production taking into account customer demand and production resources
The student is able to plan and carry out design work related to the organization of the production system.
The student is able to develop forecasts regarding the effectiveness and efficiency of production processes
The student is able to notice and identify problems occurring in systems and production processes, and select and use methods and tools appropriate to solve them.

Social competences:
The student understands the need for continuous learning; can inspire and organize the learning process of team members.
The student is able to think and act in a creative and entrepreneurial way.
The student is aware of the effects of engineering activities in both technical and non-technical areas.
The student is aware of the consequences of decisions made and responsibility for decisions made.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: Knowledge and skills acquired during lectures will be verified on the basis of a colloquium including definitional and problem questions. The test consists of 8-10 open questions and 2-4 computational tasks. The passing threshold is 50%. Passing the lecture if obtaining at least 50.1% correct answers. Up to 50.0% - ndst, from 50.1% to 60.0% - dst, from 60.1% to 70.0% - dst+, from 70.1 to 80 - db, from 80.1% to 90 .0% - db+, from 90.1% - very good.Laboratory: pass based on the preparation of a report.

Programme content

Control and analysis of material flow in the production process. IT systems supporting the supervision of material flow. Technical solutions supporting the supervision of material flow. Collection and analysis of data related to the exploitation of technical resources.

Course topics

Lecture: The role of supervising and analyzing the flow of materials in the production process. Material flow parameters. Analysis of material flow parameters. IT systems supporting the supervision of material flow (MES). Technical solutions supporting the supervision of material flow (barcodes, RFID, RTLS). Purposes of supervising the work of technical resources. Indicators: OEE, MTBF, MTTR. Collection and analysis of data related to the use of technical resources. CMMS class systems. Technical and IT solutions enabling the supervision of the work of technical resources. Prediction in the use of technical resources. Data sources in the automation system (sensors, controllers, drives, databases, etc.). Introduction to techniques that visualize the control process based on specialized software and HMI panels.
Laboratory: Historical data collection systems and their analysis. Recipe-based systems Use of measurement sensors to supervise the operation of technical resources. Analysis of technical resources operation data and determination of evaluation indicators. CMMS class system. Automatic data identification systems: barcodes, RFID, RTLS - applications.

Teaching methods

Lecture: multimedia presentation illustrated with examples, solving tasks, discussion Laboratory: solving practical problems, teamwork, simulation, discussion.

Bibliography

Basic:
Małgorzata Jasiulewicz-Kaczmarek , Dariusz Mazurkiewicz, Ryszard Wyczółkowski, Strategie i metody utrzymania ruchu, PWE 2023

Marek Kacperak, Sławomir Szymaniec, Utrzymanie ruchu w przemyśle, PWN 2021.
Stanisław Legutko, Podstawy eksploatacji maszyn, WSiP 2010
Kwiecień R., Komputerowe systemy auomatyki przemysłowej, Wydawnictwo Helion, Gliwice 2013.

Additional:
JJapan Institute of Plant Maintenance, Autonomiczne utrzymanie ruchu dla Operatorów, ProdPublishing.com
Japan Institute of Plant Maintenance , TPM dla każdego Operatora, ProdPublishing.com
Japan Institute of Plant Maintenance ,OEE dla operatorów. Całkowita Efektywność Wyposażenia, ProdPublishing.com
Terminal HMI serii NQ - Instrukcja obsługi, Omron
Wonderware Intouch- Podręcznik użytkownika, Praca zbiorowa, Invensys systems

Breakdown of average student's workload

	Hours	ECTS
Total workload	125	5,00
Classes requiring direct contact with the teacher	34	1,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	91	3,50