



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Designing of maintenance systems

### Course

Field of study

Mechanical Engineering

Area of study (specialization)

Automation and control of production systems

Level of study

Second-cycle studies

Form of study

full-time

Year/Semester

2/2

Profile of study

general academic

Course offered in

Polish

Requirements

compulsory

### Number of hours

Lecture

15

Laboratory classes

0

Other (e.g. online)

0

Tutorials

0

Projects/seminars

15

### Number of credit points

2

### Lecturers

Responsible for the course/lecturer:

Phd. Eng. Krzysztof ŻYWICKI

Responsible for the course/lecturer:

Faculty of Mechanical Engineering

email: krzysztof.zywicki@put.poznan.pl

tel. +48 61 665 2740

### Prerequisites

The student has basic knowledge of production management.

### Course objective

Learning, understanding and acquiring the ability to apply in practice the rules and tools for maintenance

### Course-related learning outcomes

Knowledge

The student knows the impact of maintenance on the functioning of the production system.

The student knows the elements of the maintenance system

The student knows in the field of preventive, planned and autonomous maintenance



The student knows the measures and indicators of the operational availability assessment of technical devices.

The student knows the basic principles of the Total Productive Maintenance concept.

#### Skills

He can practically apply the principles and tools of the Total Productive Maintenance concept

He can collect data and determine the measures of the assessment of operational availability of technical devices

Can design elements of autonomous maintenance

Is able to design elements of planned maintenance)

#### Social competences

Is aware of the importance of continuous process improvement in maintaining or gaining the company's competitiveness

Is aware of the importance of organizational integration for production efficiency

He understands the importance of improving production for the functioning of the enterprise

Can independently develop knowledge in the subject

#### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: Assessment based on a test consisting of 10 questions (credit for a correct answer for min. 6 questions: <6 - ndst, 6 - dst, 7 - dst + 8 - db, 9 - db +, 10 - vg) carried on the end of the semester.

Project: credit based on a completed project.

#### Programme content

Lecture:

- introduction (revision) of basic issues related to the organizational aspects of maintenance systems,
- the role of employees and operators in the maintenance system,
- Troubleshooting
- methods of data acquisition,
- data analysis methods and tools,
- forecasting the wear of consumables,



- IT support in the field of maintenance planning and supervision.

Project:

The project concerns the development of a technical maintenance system for a selected facility in the area of:

- system assumptions
- responsibilities
- autonomous machine maintenance: instructions / standards
- planned maintenance of machines: work / inspection schedules /
- spare parts management,
- failure reporting procedures,
- troubleshooting procedures
- data collection and analysis system

### Teaching methods

Lecture: multimedia presentation illustrated with examples given on a board, problem solving.

Project: solving practical examples in the form of tasks and simulation workshops.

### Bibliography

Basic

Japan 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

Tokutaro Suzuki, TPM in Process Industries, Taylor & Francis Inc, 1994

Stanisław Legutko, Podstawy eksploatacji maszyn, WSiP 2010

Additional

Jeffrey K. Liker (2005). Droga toyoty ? 14 zasad zarządzania wiodącej firmy produkcyjnej świata. Wydawnictwo MT Biznes.

James P. Womack, Daniel T. Jones. (2008). Lean Thinking - szczupłe myślenie. Wydawnictwo ProdPress



### Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,0
Classes requiring direct contact with the teacher	25	1,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) <sup>1</sup>	25	1,0

<sup>1</sup> delete or add other activities as appropriate