

Fundamentals of Maintenance - course description

General information	
Course name	Fundamentals of Maintenance
Course ID	06.9-WM-MaPE-PaSM-P-FofM- 23
Faculty	Faculty of Mechanical Engineering
Field of study	Management and Production Engineering
Education profile	academic
Level of studies	First-cycle studies leading to Engineer's degree
Beginning semester	winter term 2023/2024

Course information	
Semester	5
ECTS credits to win	2
Available in specialities	Production and Service Management
Course type	obligatory
Teaching language	english
Author of syllabus	<ul style="list-style-type: none">prof. dr hab. Taras Nahirnyy

Classes forms					
The class form	Hours per semester (full-time)	Hours per week (full-time)	Hours per semester (part-time)	Hours per week (part-time)	Form of assignment
Lecture	15	1	-	-	Credit with grade
Project	15	1	-	-	Credit with grade

Aim of the course

Transfer and consolidation of basic knowledge and acquisition by students of skills and competences in the field of maintenance, which will be used in the further education process and useful in future professional work.

Prerequisites

Production processes. Production and service management.

Scope

Lecture

- L1. Preliminary issues. Fundamentals of Lean Production: waste and standardization.
- L2. Reliability of products and systems, reliability indicators, Weibull distribution,
- L3. Monte-Carlo method, MTBF and OEE.
- L4. Optimization of preventive maintenance,
- L5. The pillars of TPM, Basics of TPM. Failure analyzing and creating standarts. 5S.
- L6. Six Sigma and SMED. Structures of teams of maintenance services and their analysis.
- L7. Computer-aided maintenance.
- L8. Final remarks. Passing the course.

Project

- P1 - P2. Product and system reliability,
- P3 - P4. Calculation of Weibull distribution parameters based on statistical data,
- P5 - P6. Optimal dates of preventive inspections,
- P7. Monte-Carlo method and MTBF parameter,
- P8. Correction and discussion of projects.

Teaching methods

Conventional lecture.

Project.

Learning outcomes and methods of theirs verification

Outcome description	Outcome symbols	Methods of verification	The class form
The student is able to obtain information from literature and other sources, integrate them, interpret them, draw conclusions and formulate opinions	• K_U01	• a project	• Project
The student is able to interact and work in a group at various positions.	• K_K03	• a project	• Project
The student has structured general knowledge in the field of reliability of products and the principles of maintenance related to the field of Management and Production Engineering	• K_W10	• a project • a quiz	• Lecture • Project
The student has knowledge of development trends and new achievements in the field of Management and Production Engineering regarding methods and tools for maintenance.	• K_W36	• a project • a quiz	• Lecture • Project

Assignment conditions

Lecture

Grade based on a written test verifying knowledge of basic issues

Project

Grade based on a implementation of project tasks

Final grade - arithmetic mean of the above grades.

Recommended reading

1. Steven Borris, Total Productive Maintenance, McGraw-Hill, 2006.
2. Nakajima, Seiichi. "Introduction to TPM: total productive maintenance." *Productivity Press, Inc., 1988*, (1988).
3. Wireman, Terry. *Total productive maintenance*. Industrial Press Inc., 2004.

Further reading

Notes

Modified by prof. dr hab. Taras Nahirnyy (last modification: 21-04-2023 13:24)

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