COURSE DESCRIPTION CARD - SYLLABUS

Course name

Maintenance of production systems

Course

Field of study

Management and production engineering

Year/Semester

2/4

Area of study (specialization)

Production systems

Profile of study

general academic

Level of study

Second-cycle studies

Course offered in

polish

Form of study

part-time

Requirements

elective

Number of hours

Lecture

8

Laboratory classes

8

Other (e.g. online)

Tutorials

Projects/seminars

Number of credit points

2

Lecturers

Responsible for the course/lecturer:

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Faculty of Mechanical Engineering

Piotrowo 3, 60-965 Poznan

Responsible for the course/lecturer:

Prerequisites

Basic knowledge of business structure, organization of production processes and production company management, logical thinking, the use of information obtained from literature, the Internet and manufacturing companies, understanding the need to learn and acquire new knowledge

Course objective

Increasing competence in: causes wear and reliability of technical objects, prevention and control of wear processes, human impact on the environment and its technical facilities in the next stages of their existence.

Course-related learning outcomes

Knowledge

Characteristics of wear mechanisms, the definition of terminology in the field of production proces. Definition of basic concepts of reliability of objects, attributes of phenomena occurring on the surface of solids contact. The essence of the wear processes of parts and assemblies of mechanical devices, classification, composition, properties and intended use of lubricants or stagnation. Sources of damage in the life cycle of mechanical devices, including the human factor.

Skills

Know the sources of information concerning operational problems. Can assess the impact of the complexity of mechanical devices on their reliability. Knows the essence of the wear processes of dentures, can use appropriate construction materials, understands the influence of phenomena occurring during the contact of solids on the operation of kinematic nodes. Know the rules of the role of lubricants, understand man's role in the formation of damage and unfitness. Can identify the causes of wear of elements used in production system based on symptoms and wear intensity.

Social competences

Understands the need for lifelong learning; can inspire and organize the learning process of other people. Is aware of the importance and understanding of non-technical aspects and effects of engineering activities.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: Exam based on a written test consisting of 30 test questions on a 0/1 scale. Passing for a minimum of 51%.

Project: Course passing based on partial grades and a planned experiment.

Programme content

Introduction to the exploitation of technical facilities. The phases of the existence of a technical object. Principles of the use of mechanical devices. Exploitation strategies.

Properties of solids and liquids. Solid contact zone phenomena. Friction and adhesion of metals. Non-metallic friction. Extreme friction.

Lubrication types concerning common cases. Lubrication in production systems. Properties and characteristics of solid, liquid and gaseous lubricants. Classification, selection and purpose of lubricants. The relationship between lubrication and efficiency. Degradation, ageing of lubricants during storage and use.

Tribological and tribo - chemical wear processes - essence and symptoms. Types of corrosion, occurrence and methods of prevention.

The reasons for the occurrence of damages and their sources in the subsequent technical object existence stages. Human participation in the chain of events leading to states of unfitness of technical facilities and catastrophes.

Basic concepts of reliability: reliability function, failure intensity, reliability models, structural reliability, reliability of technological devices. Maintenance of mechanical devices.

Teaching methods

1. Lecture: multimedia presentation.

2. Laboratory exercises: solving tasks, practical exercises, discussion.

Bibliography

Basic

1. St. Legutko: Eksploatacja maszyn, Wyd. Politechniki Poznańskiej, Poznań 2007.

2. St. Nosal: Tribologia, cechniki Poznańskiej, Poznań 2012.

3. S. Ścieszka, M. Żołnierz: Eksploatacja maszyn, Wyd. Politechniki Śląskiej, Gliwice 2012

Additional

1. Praca zbiorowa: ?Podstawy racjonalnej eksploatacji maszyn?, Wyd. Instytutu Technologii Eksploatacji, Radom, 1996.

2. W. Neville, P.Sachs: Practical Plant Failure Analysis, CRC Press, Boca Raton 2007.

3. H. Bloch, F. Geitner: Practical Machinery Management for Process Plants Vol.1,2,3, Gulf Professional Publishing, Houston 1999

Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,0
Classes requiring direct contact with the teacher	20	1,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) [1]	30	1,0

[1] delete or add other activities as appropriate