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
Basics of machines maintenance

Course

Field of study	Year/Semester
Mechanical Engineering	4/7
Area of study (specialization)	Profile of study
	general academic
Level of study	Course offered in
First-cycle studies	Polish
Form of study	Requirements
part-time	elective

Number of hours

Lecture	Laboratory classes	Other (e.g. online)
12	8	
Tutorials	Projects/seminars	

Number of credit points

3

Lecturers

Responsible for the course/lecturer:

prof. dr hab. inż. Stanisław Legutko

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Wydział Inżynierii Mechanicznej

ul. Piotrowo 3, 60-965 Poznań

tel.: 061 665 2577

Responsible for the course/lecturer:

Prerequisites

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Knowledge: basic knowledge in the field of materials science, tribology, machine construction, mathematical statistics, manufacturing techniques

Skils: logical thinking, using information obtained from literature and the Internet

Social competences: understanding the need to learn and acquire new knowledge

Course objective

learning about issues related to machine operation, their reliability, machine diagnostics, modern approach to machine maintenance, computer aided machine maintenance and repair and modernization technologies

Course-related learning outcomes

Knowledge

The student should characterize the essence of the use and maintenance of technical facilities

The student should be able to characterize operational strategies

The student should explain the basic concepts of machine reliability

The student should distinguish between types and groups of wear of machine parts

The student should characterize the types, characteristics and functions of lubricants

The student should characterize the basic methods of diagnostic tests

The student should indicate basic activities in the field of technology for repair and modernization of machines

The student should characterize the essence of Total Productive Maintenance

The student should characterize the essence of computer-aided machine operation

Skills

Student is able to distinguish between types of machine parts wear

Student is able to determine the dependence of consumption on the time and operating conditions of the technical object

Student is able to propose appropriate methods of regenerating machine parts

Student is able to design the technological process of renovation of the selected machine parts

Social competences

Student can work in a group

Student is aware of the role of proper maintenance of machinery and equipment in a modern enterprise and on the scale of the economy

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Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Forming rating:

a) in the laboratory: based on the current progress of the exercises

b) of lectures: not applicable

Summative assessment:

Lecture: Examination on the basis of a written test consisting of four questions rated on a scale from 0 to 1. Included in the case of a minimum of 2,6 points.

Laboratory: Assessment based on oral and written answers concerning the content of each exercise which has been performed. Laboratory report from each laboratory exercises based on indications of the teacher. All exercises must be included in order to be credited laboratories (positive evaluation of the answers and reports).

Programme content

Operation and maintenance of machines and equipment. Operating strategies. Wear of machinery and technological equipment. Lubrication. Functions, types and characteristics of lubricants in the operation of machines and devices. Fundamentals of reliability of technological devices. Measures of reliability. Machine diagnostics. Types of diagnostic tests. Examples of physical processes as sources of diagnostic signals. Practical vibroacoustic diagnostics of machines. Methodology for implementing the technical service system. Machine repair technology. Disassembly of machines. Verification and regeneration of machine parts. Methods of regenerating machine parts. Preparation of parts for assembly and assembly of machines. Modern methods of machine maintenance. Total Productive Maintenance. Computer aided maintenance of machines. Selected problems of cutting tools exploitation, metal cutting machines, machine tools for plastic working.

Teaching methods

1. Lecture: multimedia presentation with comment, illustrated with examples on the board and short films.

2. Laboratory exercises: a multimedia presentation illustrated with examples given on a blackboard and performing tasks given by the teacher - practical exercises.

Bibliography

Basic

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

2.   St. Legutko: Podstawy eksploatacji maszyn i urządzeń, Wydawnictwa Szkolne i Pedagogiczne, Warszawa 2010.

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3.	St. Legutko: Obsługa maszyn i urządzeń, Wydawnictwa Szkolne i Pedagogiczne, Warszawa 2013.

Additional

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

2.	Gwidon Stachowiak, Andrew W. Batchelor: Engineering Tribology, Elsevier Inc., 2005, ISBN-13: 978-0750678360.

3.	Heinz P. Bloch, Fred K. Geitner: Machinery Failure Analysis and Troubleshooting, Gulf Professional Publishing, Houston Texas, 1999, ISBN-13: 978-0123860453.

4.	Neville W. Sachs: Practical Plant Failure Analysis, Dekker Mechanical Engineering, CRC Press, 2006, ISBN-13: 978-0849333767.

5.	Internet

Breakdown of average student's workload

	Hours	ECTS
Total workload	60	3,0
Classes requiring direct contact with the teacher	20	
Student's own work (literature studies, preparation for tests) [1]	40	

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[1] delete or add other activities as appropriate