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 reliability

Course

Field of study	Year/Semester
Mechanics and mechanical engineering	3/5
Area of study (specialization)	Profile of study
all specialties	general academic
Level of study	Course offered in
First-cycle studies	polski
Form of study	Requirements
full-time	compulsory

Number of hours

Lecture	Laboratory classes	Other (e.g. online)
15	1	1
Tutorials	Projects/seminars	
15	1	

Number of credit points

1

Lecturers

Responsible for the course/lecturer:	Responsible for the course/lecturer:
prof. dr hab. inż. Karol Nadolny	dr inż Kasper Górny
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WILiT	WILiT
ul. Piotrowo 3,	ul. Piotrowo 3,
60-965 Poznań	60-965 Poznań

Prerequisites

He has knowledge of mechanics, strength, probability calculus and mathematical statistics. Can make basic calculations in the field of probability calculus and mathematical statistics.

Course objective

Getting to know the basic methods of reliability design at the stage of construction and testing and evaluation of reliability in the course of operation of machines and technological processes, as well as the methods used to control it.

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Course-related learning outcomes

Knowledge

1. it acquires an extended knowledge of the various stages and processes in the life cycle of technical objects, mainly mechanical.

2. He learns the methods of forecasting reliability at the stage of their design and methods of assessing the reliability of operating facilities.

3. It acquires knowledge of modern and unacceptable methods of controlling the reliability of technical objects. z

Skills

Acquiring the ability to obtain information from literature, the Internet, databases and other sources. He/she can integrate information obtained, interpret, draw conclusions from it and create and justify original opinions and, on their basis, formulate generalisations.

Social competences

He is ready to critically assess his knowledge and the content he receives, especially from internet profiles.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Written, individual solution of tasks concerning the assessment and forecasting of reliability of elements of technical objects and complex systems using specialized IT techniques.

Programme content

Reliability as a measure of product quality. Basic descriptive and value-adding definitions. The development of reliability science. Characteristics of the ways of organising the use of technical facilities (renewable and non-renewable facilities). Description of destruction processes of elements, objects and technical systems. Definitions of physical damage (catastrophic) and contractual damage (parametric). The concept of damage intensity. Mathematical models to describe the intensity of reliability changes during use - population coverage. Selected probabilistic and statistical methods for estimating indicators for evaluating changes in reliability of technical objects. Introduction to the description of structural reliability of complex objects - systems. Examples of estimating reliability of real technical objects.

Teaching methods

Lecture, use of available IT systems to develop and evaluate reliability test results

Bibliography

Basic

1. Poradnik niezawodności. T 1. pod red. J. Migdalskiego, Wyd. WEMA, Warszawa 1982r.

2. Warszyński M., Niezawodność w obliczeniach konstrukcyjnych. PWN. Warszawa 1988r.

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3. Poradnik niezawodności. T 2. pod red. J. Migdalskiego, Wyd. WEMA, Warszawa 1996r.

4. Radkowski S., Podstawy bezpiecznej techniki. Oficyna Wydawnicza Pol. Warszawskiej, Warszawa 2003r

5. Szopa T., Niezawodność i bezpieczeństwo. Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa, 2009..

Additional

1. Bobrowski D., Modele i metody matematyczne teorii niezawodności w przykładach i zadaniach, WNT, Warszawa, 1985.

2. Karpiński J., Korczak E., Metody oceny niezawodności dwustanowych systemów technicznych. Wyd. Omnitech Press, Instytut Badań Systemowych, Warszawa, 1990.

3. Słowiński B., Podstawy badań i oceny niezawodności obiektów technicznych. Wyd. Uczelniane Wyższej Szkoły Inżynierskiej w Koszalinie, Koszalin 1992.

4. Żółtowski J., Podstawy niezawodności maszyn. Wyd. Politechniki Warszawskiej, Warszawa 1985.

5. Żółtowski J., Wybrane zagadnienia z podstaw konstrukcji i niezawodności maszyn. Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa, 2004

Breakdown of average student's workload

	Hours	ECTS
Total workload	40	1,0
Classes requiring direct contact with the teacher	30	
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) [1]	10	

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[1] delete or add other activities as appropriate