COURSE DESCRIPTION CARD - SYLLABUS

Course name
Durability and reliability of electrical devices [S1Elmob1>TiNUE]

Course

Field of study
Electromobility

Year/Semester
1/2

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
Polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
15

Laboratory classes
0

Other (e.g. online)
0

Tutorials
0

Projects/seminars
0

Number of credit points

1,00

Coordinators

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Lecturers

Prerequisites

Basic information on theoretical electrical engineering, metrology, machines and electrical devices.

Course objective

Getting to know the theoretical and practical issues related to the reliability of electrical and electronic equipment and its durability.

Course-related learning outcomes

Knowledge:
1. Has knowledge of the durability and exploitation of technical systems in the form of electrical and electronic circuits and devices used in electromobility.
2. Knows and understands the life cycle processes of electrical and electronic systems that affect their correct exploitation and durability.

Skills:
1. Able to develop technical solutions and principles for the exploitation, testing and diagnostics of equipment on the basis of reliability requirements.

2. Can use standards, technical documentation and datasheets to select appropriate elements of a technical system and assess its correct functioning

Social competences:
Understands the important role of determining the reliability of electrical and electronic equipment in the design and exploitation processes.
Aware of the need to apply standards and directives when designing and operating electromobile systems.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

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Knowledge and skills are evaluated on basis of a pass test with open and closed test questions. The pass threshold for the test is 50% of the points available. Additionally, attendance and activity during the lecture will be rewarded.

Programme content

The course presents the definitions and concepts of reliability and the coefficients commonly used to determine it. In addition, numerous examples are presented including methods for the practical determination of reliability in electrical equipment.

Course topics

Lecture
1. Basic principles of reliability and its role in different technical sciences.
2. Definitions, characteristics and distributions of reliability, life cycle of electrical equipment, operating requirements.
3. Reliability analysis of devices, electrical and electronic systems, safety, quality control.
4. Strategy and management of devices exploitation, technical inspections, renovations, modernizations.
5. Testing, diagnosis and monitoring of the operational status of electrica

Teaching methods

The lectures are given using multimedia presentations illustrated with examples and the necessary mathematical calculations also on the board.

Bibliography

Basic
1. S. Legutko, Podstawy eksploatacji maszyn, Wydawnictwo Politechniki Poznańskiej, 1999
2. R. Szeloch, Statystyczne i termiczne problemy niezawodności elementów elektronicznych, Wrocław : Oficyna Wydawnicza PW, 1997
3. M. Hebda, Elementy teorii eksploatacji systemów technicznych, MCNEMT, Radom, 1990
4. S. Lesiński, Projektowanie elementów urządzeń elektrotechnicznych ze względu na ich niezawodność, Wydawnictwa Uczelniane Akademii Techniczno Rolniczej w Bydgoszczy, 1996
Additional
5. T. Szopa, Niezawodność i bezpieczeństwo. Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2016

Breakdown of average student's workload

	Hours	ECTS
Total workload	28	1,00
Classes requiring direct contact with the teacher	15	0,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	13	0,50