



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Durability and reliability of electrical devices

Course

Field of study

Electromobility

Area of study (specialization)

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

1/2

Profile of study

general academic

Course offered in

polish

Requirements

compulsory

Number of hours

Lecture

15

Laboratory classes

Other (e.g. online)

Tutorials

Projects/seminars

Number of credit points

1

Lecturers

Responsible for the course/lecturer:

Dariusz Prokop Ph.D. Eng.

Responsible for the course/lecturer:

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Faculty of Automatic, Robotics and Electrical

Engineering

Piotrowo 3 Street, 60-965 Poznań

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:

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

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 electrical equipment.
6. Processes of electric object wear, ageing and loss of exploitation properties.
7. Reliability and economic aspects, disposal, recycling of electrical equipment.

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	25	1,0
Classes requiring direct contact with the teacher	15	0,5
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) ¹	10	0,5

¹ delete or add other activities as appropriate