COURSE DESCRIPTION CARD - SYLLABUS

Course name

Electromagnetic compatibility

Course

Field of study

Electrical engineering

Year/Semester

1/2

Area of study (specialization)

Profile of study

general academic

Level of study

Second-cycle studies

Course offered in

polish

Form of study

full-time

Requirements

compulsory

Number of hours

Lecture

15

Laboratory classes

15

Other (e.g. online)

Tutorials

Projects/seminars

Number of credit points

2

Lecturers

Responsible for the course/lecturer:

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Wydział Automatyki, Robotyki i Elektrotechniki

Piotrowo 3A, 60-965 Poznań

Responsible for the course/lecturer:

Prerequisites

The student starting the course should have basic knowledge in mathematics, physics and electrical engineering (calculation of electrical circuits and electromagnetic fields). He should also be aware of the need to expand his knowledge, understand the need for cooperation within the group

Course objective

Mastering the knowledge of the basic problems of electromagnetic compatibility and methods of simulation of EMC issues.

Course-related learning outcomes

Knowledge

student will be able to recognize the sources, parameters and causes of electromagnetic disturbances,

mechanisms of propagation of disturbances and their impact on devices and systems, identify the impact of the electromagnetic field on the technical and biological environment and propose measures and devices to limit their impact

Skills

student is able to analyze the causes and effects of electromagnetic interference (em), define sources, parameters of em disturbances, examine the mechanisms of disturbance spread and their impact on devices and systems, calculate the impact of em field on the technical and biological environment, will be able to assess the emission and resistance of electrical devices for electromagnetic disturbances, take measures limiting the effects of excessive emissions and increasing immunity in the field of electromagnetic compatibility

Social competences

creatively thinks and works in the area of electromagnetic compatibility, is able to intelligently communicate the objectives of electromagnetic compatibility to the public

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture:

- assessment of knowledge and skills demonstrated during the written exam of a problem nature.

Laboratory exercises:

- test and rewarding of knowledge necessary to implement the problems posed in a given area of laboratory tasks,

- continuous assessment, during each class - rewarding the increase in the ability to use known principles and methods,

- assessment of knowledge and skills related to the implementation of the exercise task, evaluation of the report of the exercise,

- rewarding cooperation skills within a team that practically performs a specific task in a laboratory,

- rewarding aesthetic diligence of prepared reports and tasks within self-study

Programme content

Introduction and general electromagnetic compatibility (EMC) issues, basic terms and units. Basic concepts of electromagnetism and signal analysis. Sources, classification and parameters of electromagnetic disturbances. Mechanisms of propagation of disturbances and their impact on devices and systems. The impact of the electromagnetic field on the technical and biological environment. Measures and devices limiting the impact of disorders. Basics of computer simulation of EMC issues

Teaching methods

1. Lecture: multimedia presentation and a classic lecture with examples at the board,

3. Laboratory exercises: Experimental verification of issues related to electromagnetic compatibility through the implementation of practical exercises on test stands.

Bibliography

Basic

1. Machczyński W.: Wprowadzenie do kompatybilności elektromagnetycznej, Wydawnictwo Politechniki Poznańskiej, Poznań 2010.

2. Krakowski M.: Elektrotechnika teoretyczna. Tom 2, PWN, Warszawa 1995.

3. Alfa-Weka: Praktyczny poradnik. Certyfikat CE w zakresie kompatybilności elektromagnetycznej. Normy i zasady bezpieczeństwa w elektrotechnice. Tom 1-3, Alfa-Weka, Warszawa 1998-2001

Additional

1. Paul C. R.: Introduction to electromagnetic compatibility, Wiley, New York 2006.

2. Kaiser K. L.: Electromagnetic compatibility handbook, CRC Press, Boca Raton 2005.

3. Perez R.: Handbook of electromagnetic compatibility, Academic Press, New York 1995.

4. Tesche F. M., Ianoz M. V., Karlson T.: EMC analysis methods and computational models, Wiley, New York 1997

Breakdown of average student's workload

	Hours	ECTS
Total workload	60	2,0
Classes requiring direct contact with the teacher	50	2,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam) [1]	10	1,0

[1] delete or add other activities as appropriate