



RTU Course "Electro-Magnetic Compatibility in Industrial Electronic Equipment"

11103 Industriālās elektronikas un elektrotehnol.katedra

General data

Code	EEP581
Course title	Electro-Magnetic Compatibility in Industrial Electronic Equipment
Course status in the programme	Compulsory/Courses of Limited Choice
Course level	Post-graduate Studies
Course type	Academic
Field of study	Power and Electrical Engineering
Responsible instructor	Leonīds Ribickis
Academic staff	Gundars Ašmanis
Volume of the course: parts and credits points	1 part, 2.0 Credit Points, 3.0 ECTS credits
Language of instruction	LV, EN, RU
Possibility of distance learning	Not planned
Maximum auditorium capacity	100
Maximum number of students per semester	200
Abstract	EMC regulations (EU 89/336 EEC) for industrial and domestic electrical equipment. Input and output filters of electronic equipment, grounding, maintenance regulations. Methods and equipment for detection of electromagnetic pollution.
Goals and objectives of the course in terms of competences and skills	The aim is to study calculation and testing methods of the parameters of electronic and electric equipment electro-magnetic compatibility; to get skills to describe regulations of electro-magnetic compatibility of industrial and domestic electronic equipment according to the EU directive 89/336; to select input and output filters, to get knowledge of regulations of grounding and assembling of electronic equipment; to skills to apply correctly methods and equipment for electro-magnetic pollution determination.
Structure and tasks of independent studies	Self-dependent work for mastering of the lectures material, preparation for tests and final exam.
Recommended literature	1. C. R. Paul. Electromagnetic Compatibility. Second Edition. John Wiley & Sons, 2006. 975 p. 2. A.Ločmelis, L.Ribickis Elektroiekārtu elektromagnētiskā savietojamība. - Rīga:RTU. 2003, 84 lpp
Course prerequisites	Electrical engineering and electronics, Theoretical basics of electrical engineering, electronic devices, power electronics.

Course outline

Theme	Hours
Electromagnetic compatibility. Character of electro-magnetic interference.	2
Legislation (Latvian, EU, EMC directive, standards).	2
Emission of harmonic components, emitted controllability interference.	2
Interference emitted in the ether.	2
Measurements of harmonic components of current, emitted controllability interference.	2
ESD pulse-type interference immunity, Surge, EFT/Burst, industrial frequency magnetic field immunity.	2
Controllability interference immunity.	2
ESD, Surge, EFT/Burst, industrial frequency magnetic field immunity.	2
Shielding, grounding, filters.	2
Standard EN 61800-3 „Systems of electric drive with changing rotation speed”.	2
Problems of EMC in printed circuit boards in digital control systems.	2
Problems of EMC in printed circuit boards in digital control systems.	2
Shielding, grounding, filters.	2
Problems of EMC in printed circuit boards in digital control systems.	2
Information summarizing, tutorial.	2
Final test.	2

Learning outcomes and assessment

Learning outcomes	Assessment methods
The students are able to describe types of EMC interference and influence of its parameters on the environment.	Test examining the students' ability to describe types of EMC interference and influence of its parameters on the environment.
The students are able to describe emission interference and methods of its testing.	Test examining the students' ability to describe emission interference and methods of its testing.

The students are able to describe radiation interference and methods of its testing.	Test, examining the students' ability to describe radiation interference and methods of its testing.
The students are able to develop proposals for limitation of EMC interference of electronic and electric circuits and devices.	Test examining the students' ability to develop proposals for limitation of EMC interference of electronic and electric circuits and devices. Exam.

Study subject structure

Part	CP	ECTS	Hours per Week			Tests		
			Lectures	Practical	Lab.	Test	Exam	Work
1.	2.0	3.0	2.0	0.0	0.0		*	