



RTU Course "Introductory Course in Adaptronics"

11103 Department of Industrial Electronics and Electrical Technologies

General data

Code	EEI713
Course title	Introductory Course in Adaptronics
Course status in the programme	Compulsory/Courses of Limited Choice
Course level	Undergraduate Studies
Course type	Professional
Field of study	Power and Electrical Engineering
Responsible instructor	Pēteris Apse-Apsītis
Academic staff	Alvis Sokolovs Ingars Steiks Anastasija Žiravecka
Volume of the course: parts and credits points	2 parts, 4.0 Credit Points, 6.0 ECTS credits
Language of instruction	LV, EN
Annotation	Training session (2h) are organised as follows: lecture- up to 1 hour, the rest- practical work. The students are informed in the development of electrical engineering and electrical technologies, smart electrical technologies, sensors, actuators and electrical drive, resources of electric energy, its generation, transmission networks and smart grids, elements of the systems, micro-controllers, electro-technological molecule. The theoretical basics of electrical engineering are taught and different methods of electric circuits are considered. The information about free choice subjects is given for the further studies.
Goals and objectives of the course in terms of competences and skills	The main goal of the subject is a close acquaintance of the students with the chosen speciality, all opportunities of the studies in this field and subjects. Possibility to gain practical skills, necessary for future studies.
Structure and tasks of independent studies	The students actively participate to gain theoretical knowledge and practical skills and develop their projects on basis of the Latvenergo Radošā Laboratorija (Creative Laboratory).
Recommended literature	P. Apse-Apsītis, Adaptronika un elektrotehnoloģiju datorvadība, Rīga, RTU Izdevniecība, 2015. 16 lpp. P. Apse-Apsītis, L. Ribickis, Elektrotehnoloģisko iekārtu bezvadu monitorings un vadība, Rīga, RTU Izdevniecība, 2015., 80 lpp. P. Apse-Apsītis, L. Ribickis, Viedās elektrotehnoloģijas un lietiskais internets, Rīga, RTU Izdevniecība, 2015., 100 lpp. Educational and informational materials on Internet.
Course prerequisites	Mathematics, physics, electricity and magnetism at the level of secondary school.

Course outline

Theme	Hours
General description of the speciality, working places. Basic branches of the studies and their main points.	2
History of Electrical Technologies.	8
Basic theoretical laws of electrical engineering. Electricity and magnetism.	4
Sensor at sensor applications.	4
Application of semiconductor converters in smart electrical technologies	4
Introduction into free choice subjects of the following years.	2
Final test.	4
Actuators and actuator applications. Electrical drive systems and elements.	6
Alternative electrical energy sources. Effective illumination and luminaries	6
Wired and wireless data exchange methods and tools	4
Electronic simulation of human senses	6
DC and AC systems. Smart grids. Energy saving.	4
Micro-controllers and applications, programming languages and environment.	6
Electro-technological molecule.	2
Smart assistants. Basics of e-Health	2

Learning outcomes and assessment

Learning outcomes	Assessment methods
The students know the responsibilities and main tasks of an engineer, content of the study subjects and goals of the program.	The students define the subjects necessity for the work within the frames of different fields.
The students solve elementary tasks in the field of electricity and magnetism applying basic laws of electrical engineering.	At least three tasks in theoretical electrical engineering with further testing of them must be solved.

Applying the obtained knowledge of free choice subjects and analysing the branches these subjects are taught the students are able to evaluate the necessity of the particular subject.

The students reasonably choose free choice subjects for their further studies at the 2nd and 3rd years.

Study subject structure

Part	CP	Hours per Week			Tests		
		Lectures	Practical	Lab.	Test	Exam	Work
1.	1.0	0.5	0.5	0.0	*		
2.	3.0	0.5	2.5	0.0			*