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Study programme "Smart Electronic Systems"

Main attributes

Title	Smart Electronic Systems
Identification code	EGV0
Education classification code	47523
Level and type	Professional Master Study
Higher education study field	Information Technology, Computer Engineering, Electronics, Telecommunications, Computer Control and Computer Science
Head of the study field	Agris Nikitenko
Deputy head of the study field	Jurgis Poriņš
Department responsible	Institute of Microwave Engineering and Electronics
Head of the study programme	Dmitrijs Pikuļins
Professional classification code	2152 01
The type of study programme	Full time
Language	Latvian, English
Accreditation	31.05.2013 - 31.12.2023; Accreditation certificate No 2020/80
Variant 1	
Volume (credit points)	60.0
Duration of studies (years)	Full time studies - 1,5
Degree or/and qualification to be obtained	Professional master degree in electronics / Leading electronics engineer
Qualification level to be obtained	The 7th level of European Qualifications Framework (EQF) and Latvian Qualifications Framework (LQF); the 7th level of professional qualification
Programme prerequisites	Professional bachelor degree in electrical science and professional qualification of an electronics engineer or comparable education
Variant 2	
Volume (credit points)	80.0
Duration of studies (years)	Full time studies - 2,0
Degree or/and qualification to be obtained	Professional master degree in electronics / Leading electronics engineer
Qualification level to be obtained	The 7th level of European Qualifications Framework (EQF) and Latvian Qualifications Framework (LQF); the 7th level of professional qualification
Programme prerequisites	Bachelor degree of engineering science in electronics and automation or equivalent education
Variant 3	
Volume (credit points)	100.0
Duration of studies (years)	Full time studies - 2,5; Extramural - 3,0
Degree or/and qualification to be obtained	Professional master degree in electronics / Leading electronics engineer
Qualification level to be obtained	The 7th level of European Qualifications Framework (EQF) and Latvian Qualifications Framework (LQF); the 7th level of professional qualification
Programme prerequisites	Bachelor degree of engineering science in electrical science or related field

Description

Abstract	The professional master's study program "Smart Electronic Systems" prepares specialists - engineers who are able to work in the field of research, development, installation, operation and modernization of electronic embedded and data transmission systems.
Aim	To prepare specialists who understand the development trends of the industry in the world and are able to work in the field of research, development, installation, operation and modernization of smart electronic equipment and systems.

Tasks	<p>The tasks of the prof. master's study program "Smart Electronic Systems" are as follows:</p> <ul style="list-style-type: none"> • to provide competitive education in the design of smart electronic systems in accordance with the level of master's studies and international standards; • to provide students with knowledge about the physical processes used in electronics and the technical solutions of circuits; • to ensure the development and changes of the content of the study program, realization of the study process, scientific research work, in accordance with changes in the fields of electronic systems design, international practice, science and didactic practice; • to provide students with comprehensive knowledge, develop skills and competence in accordance with the requirements of the market for electronics engineers, preparing students for practical work in the design, manufacture and maintenance of smart electronic systems; • to provide students with knowledge about the use of computer tools in the analysis and design of electronic systems; • to provide opportunities to acquire skills in research, problem formulation and analysis, innovation, strategy development, project definition and implementation, as well as organizational work, incl. theoretical and experimental research and literature analysis; • to promote students' interest in further professional development by providing knowledge and skills for independent study to increase their academic and professional qualifications.
Learning outcomes	<p>Graduate of the professional master's study program "Smart Electronic Systems":</p> <ul style="list-style-type: none"> • is able to develop circuit diagrams of electronic equipment and systems, make prototypes, perform their testing, analysis and improvement, observing the binding, industry-specific requirements of regulatory enactments and standards applicable to systems, processes and products; • is able to determine production technological processes, manage the production of electronic equipment and systems in accordance with technical documentation, standards and quality management system; • is able to conduct research with scientific value in the field of smart electronic systems, professionally systematize information, summarize, interpret and analyze research results, prepare summary reports and publications; • is able to apply current technologies and software in the design and production process of electronic equipment and systems; • is able to design electronic equipment and systems, perform their operation modeling, management software development; • is able to develop printed circuit boards, develop the corresponding technical documentation; • is able to evaluate human resources and create a project working group, delegate work tasks and control their execution, present the progress and results of the project; • knows at the level of understanding: current electronic equipment production technologies, electronics industry standards and technical norms; • knows electrodynamics, electromagnetic compatibility and antenna theory at the application level; • is familiar with analog and digital circuitry at the application level; • knows at the application level the theory of signal processing, the construction and design of transmission and reception equipment, as well as data transmission networks, sensors and actuators; • knows the programming of microcontrollers, signal processors, programmable logic circuits in a high-level language at the application level.
Final/state examination procedure, assessment	<p>The programme is concluded with the state examination, where the elaboration and defence of a Master Thesis in a public session of the State Examination Commission (SEC) is a constituent part of this examination. At the same time, the acquisition of key theoretical and field-specific professional knowledge is tested.</p> <p>The SEC consists of at least five members. The chair and at least half of the panel are composed of representatives of professional organisations or employers from the industry. Students' knowledge, skills and competence are assessed collegially by the SEC on a 10-grade scale.</p>
Description of the future employment	<p>SAF Tehnika, SIA Mikrotīkls, Arcus Elektronika, Latvijas Radio un Televīzijas Centrs, Latvijas Radio un Latvijas Televīzija, Lattelekom, Latvijas Mobilais Telefons, Tele2, Elektronisko Sakaru direkcija, a/s "Alfa", SIA "Hanza Elektronika", Accenture, UAV Factory, Citrus Solutions, Draugiem Group, Intelligent Systems, Vizulo, Regula Baltia, Aerones.</p>
Special enrollment requirements	
Opportunity to continue studies	Doctoral studies

Courses

No	Code	Name	C.p. [1]	C.p. [2]	C.p. [3]
A		Compulsory Study Courses	23.0	23.0	36.0
1	RRI702	Application of Microprocessors and Microcontrollers	3.0	3.0	3.0
2	RTR519	Integrated Devices and Their Applications			3.0
3	RTR803	Signal Processing Systems	3.0	3.0	3.0
4	RTR804	Signal Processing Systems (Study work)	2.0	2.0	2.0
5	RRI705	5G Wireless Technologies			3.0
6	RRI706	5G Wireless Technologies			2.0
7	REA707	Digital Electronic Systems Design	3.0	3.0	3.0
8	RRI707	Electronic Systems for Data Transmission	3.0	3.0	3.0
9	RTR512	Microwave Devices and Equipment	3.0	3.0	3.0
10	RTR802	Advanced Electromagnetic Simulations Methods and Software			4.0
11	RTR832	Simulation of Functional and Logical Circuits	3.0	3.0	3.0
12	REA703	Data Transmission in Wireless Sensor Networks	3.0	3.0	3.0
13	ICA104	Civil Defence			1.0
B		Compulsory Elective Study Courses	11.0	11.0	12.0
B1		Field-Specific Study Courses	11.0	11.0	12.0
1	RRI405	Electroacoustics	2.0	2.0	2.0
2	RRI465	Electromagnetic Compatibility of Radio Devices and Systems	2.0	2.0	2.0
3	RRI495	Electronic Communications			3.0
4	REA407	Design Technologies	3.0	3.0	3.0
5	RTR702	Integrated Circuit Design. Part 1	3.0	3.0	3.0
6	RTR703	Integrated Circuit Design. Part 2	2.0	2.0	2.0
7	RTR801	Software Defined Radio	3.0	3.0	3.0
8	RTR710	Signal Processing in Heterogeneous Systems Containing FPGA	3.0	3.0	3.0
9	RRI708	Design and Documentation of Electronic Equipment	3.0	3.0	3.0
10	RRI488	Innovation Management	2.0	2.0	2.0
11	RTR808	Impedance Spectroscopy in medicine and technology	3.0	3.0	3.0
12	RRI705	5G Wireless Technologies	3.0	3.0	
13	RRI706	5G Wireless Technologies	2.0	2.0	
14	RTR802	Advanced Electromagnetic Simulations Methods and Software	4.0	4.0	
15	RTR819	Microelectronic Devices in Analogue Circuit Design	3.0	3.0	
D		Practical Placement	6.0	26.0	26.0
1	RRI715	Internship		20.0	20.0
2	RRI714	Applied Research Internship	6.0	6.0	6.0
E		Final Examination	20.0	20.0	26.0
1	RRK002	Master Thesis	20.0	20.0	
2	RRI011	Master Thesis Including Project			26.0

K.p.[*] kredītpunkti studiju programmas variantā