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RĪGAS TEHNISKĀ UNIVERSITĀTE

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Study programme "Intelligent Robotic Systems"

Main attributes

Title	Intelligent Robotic Systems
Identification code	DBR0
Education classification code	43481
Level and type	Academic Bachelor Study
Higher education study field	Information Technology, Computer Engineering, Electronics, Telecommunications, Computer Control and Computer Science
Head of the study field	Jānis Grundspeņķis
Deputy head of the study field	Jurģis Poriņš
Department responsible	Faculty of Computer Science and Information Technology
Head of the study programme	Agris Ņikitenko
Professional classification code	
The type of study programme	Full time
Language	Latvian
Accreditation	31.05.2013 - 30.05.2019; Accreditation certificate No 21
Volume (credit points)	120.0
Duration of studies (years)	Full time studies - 3,0
Degree or/and qualification to be obtained	Bachelor Degree of Engineering Science in Computer Control and Computer Science
Qualification level to be obtained	The 6th level of European Qualifications Framework (EQF) and Latvian Qualifications Framework (LQF)
Programme prerequisites	General secondary education or 4-year vocational secondary education

Description

Abstract	The study program "Intelligent robotic systems" is one of the latest engineering programs in Riga Technical University and the first of its kind in the Baltic States. The provided knowledge and skills are fully consistent with today's requirements in automation and robotics.
Aim	The aim of the academic Bachelor study programme "Intelligent Robotic Systems" is to prepare professionals who can be characterized by ability to think systematically, to analyze, develop and implement technically and economically reasoned robotic and intelligent system solutions that promote application of these solutions to ensure organizations' labor productivity increase and growth, as well as to develop the student's ability to carry out scientific work, to participate in local and international projects and to continue studies at Master and Doctoral study programmes.
Tasks	To achieve the aim set several tasks of the study programme are defined, as well as indicators of their fulfillment. They are reflected in the Table below: 1)To develop students' systems thinking ability and practical skills that are necessary for development of the technically and economically reasoned robotic and intelligent systems solutions 2)To use in the study process both fundamental and classical solutions and the latest achievements in robotics and artificial intelligence. To promote students' individual and practical work, as well as direct communication and work in groups 3)To provide knowledge and experience provision for students in several areas by cooperation with teaching stuff from different departments of Riga Technical University (RTU) 4)To assure the flexibility of the study program and the possibility to modify it in order to follow changes in the labor market and new developments in Information and Communication Technology (ICT) 5)To prepare and motivate students for their Master studies 6)To ensure learning outcomes defined for the program listed below 7)To develop cooperation with similar or topic-related programs in other countries within ERASMUS and other agreements
Learning outcomes	According to the learning outcomes defined for the "Intelligent Robotic Systems" study programme, the graduates of the programme will: 1)be able to formulate a specific problem in terms of automated and robotic systems; 2)be able to develop solutions to particular problems by using modern automatic and electric drive elements; 3)be able to develop an automatic or robotic system's control algorithm; 4)be able to develop software for a specific robotic or automatic equipment management and coordination; 5)be able to develop solutions that combine hardware and software technology advantages; 6)know how to distinguish problems that should be solved with the hardware resources from those which should be solved with software resources; 7)know how to identify problems that can be solved with intelligent robotic systems; 8)be able to independently acquire new knowledge and skills; 9)be able to work in group to achieve common goals; 10)be able to substantiate the specific solution's advantages or disadvantages to the customer or to another professional; 11)be able to provide compliance to professional and general ethic rules within their scope of authority; 12)be prepared for their Master studies.

Final/state examination procedure, assessment	The results evaluation system is based on RTU Learning Outcomes Evaluation Regulations (Minutes no. 539) approved on March 29, 2010. The evaluation methods for each subject are defined by the responsible academic personnel (teacher) according to study course goals, tasks and applied teaching methods. The evaluation methods are known to students at the beginning of the semester. Some of the evaluation methods used by teachers are as follows: 1) written or oral examinations during the session; 2) written or oral individual work, the learning outcomes of which can include a presentation; 3) project that can be evaluated according to the student's contribution to group work; 4) regular tests during semester; 5) combination of the previously mentioned methods; Assessment of each subject is determined according to 10 grade scale or in case of the test with the pass/fail. Bachelor Paper is also evaluated according to 10 grade scale.
Description of the future employment	Graduates are ready to start their career as specialists in robotics and automation in companies that exploit automated production lines as well as robotics and automation service engineers. According to specifics of the provided knowledge and skills graduates can easily perform as low level programmers, production or service engineers.
Special enrollment requirements	Basic requirements: To begin studies at academic Bachelor study programme "Intelligent Robotic Systems" an applicant should have general or vocational secondary education. Additional requirements: To begin studies on academic Bachelor study programme "Intelligent Robotic Systems" student should have knowledge in physics, chemistry, algebra and geometry according to the requirements of secondary education.
Opportunity to continue studies	Graduates are ready to continue their studies on academic Masters study programme "Intelligent robotic systems" or other programme similar in terms of its content implemented by Riga Technical University. The Faculty of Computer Science and Information Technology guarantees that if Intelligent Robotic Systems (DBR0) is liquidated, the students will be able to continue their studies on the study programme Computer Systems (DBD0)

Courses

No	Code	Name	Credit points
A		**Compulsory study courses**	**86.0**
1	DSP105	Introduction to Study Field	1.0
2	DIM701	Mathematics	9.0
3	DIM208	Supplementary Mathematics (for mechanical engineering)	2.0
4	DOP204	Numerical Methods	2.0
5	DIM707	Discrete Mathematics	3.0
6	DMS212	Probability Theory and Mathematical Statistics	2.0
7	DMS214	Random Processes	2.0
8	MFZ101	Physics	6.0
9	MTM207	Theoretical Mechanics (in robotic systems)	3.0
10	MTM208	Robot Kinematics	3.0
11	EEE226	Electrical Engineering and Electronics	2.0
12	BTG701	Fundamentals of Graphics Communication	2.0
13	DAA300	Fundamentals of Computer Graphics and Image Processing	2.0
14	DIP107	Algorithmization and Programming of Solutions	6.0
15	DPI230	Object-Oriented Programming	3.0
16	DSP202	Discrete Structures of Computer Science	3.0
17	DSP332	Fundamentals of Artificial Intelligence	3.0
18	EEI356	Linear and Nonlinear Systems	2.0
19	DST306	Microprocessor Technology	3.0
20	EEM730	Special Electrical Machinery for Robotic Systems	3.0
21	RTR220	Basics of Signal Theory	4.0
22	ICA301	Civil Defence	1.0
23	SDD701	Innovative Product Development and Entrepreneurship	4.0
24	DIP256	Programming Language C ++ for Controllers Management	4.0
25	DIP203	Data Structures	3.0
26	DDI711	Basics of Computer Control	3.0
27	DST203	Introduction to Computer Architecture	3.0
28	DSP712	Robot control system development project	2.0
B		**Compulsory elective study courses**	**20.0**
B1		**Field-specific study course**	**14.0**
1	EEI505	Introduction to Digital Electronics	3.0
2	DSP716	Robot systems modeling basics	3.0
3	EEP352	Electric Drive of Robots	2.0
4	DSP711	Basics of autonomous and mobile robotic systems	2.0
5	DDI701	Industrial robot control systems	2.0
6	EEL301	Power Electronics	2.0
7	DSP724	Foundations of Computer and Robotic Systems Design	2.0
8	DSP723	Logical Foundations of Intelligent Robots	2.0
9	EEI213	Electrical Drives (Study Project)	2.0
10	EEI358	Intelligent Electronic Equipment in Robotic Systems	3.0
11	EEP346	Traction Drives of Electrical Transport	2.0
12	EEP351	Introduction to Electrical Drives	2.0
13	EEP579	Industrial Electronic Equipment	2.0
14	EEP582	Control Technique with Microprocessor Controllers	3.0
B2		**Humanities and social sciences study courses**	**2.0**
1	HSP377	General Sociology	2.0
B6		**Languages**	**4.0**
1	VIA120	The English Language	4.0
2	VIV120	The German Language	4.0
C		**Free elective study courses**	**4.0**
E		**Final examination**	**10.0**
1	DSP719	Bachelor thesis	10.0