



Joint Curricula Master Degree Program

Embedded Systems and Robotics

Participating Institutions: Kaiserslautern University of Technology (Kaiserslautern, Germany) – TUKL and Kazan National Research Technical University named after A.N. Tupolev-KAI (Kazan, Russia) – KNRTU-KAI.

Duration of Study: 2 years.

Place for Study: 1st, 2nd semesters at KNRTU-KAI, 3rd semester at Kaiserslautern University of Technology, 4th semester at KNRTU-KAI or Kaiserslautern University of Technology.

1st semester

Module	Credits of module	Contact hours	Individual work hours	Exams	Total student workload	Forms of final examination	Department	
1	2	3	4	5	6	7	8	9
Concurrency Theory	8	86	166	36	288	exam	KNRTU-KAI (CS)	CST
Introduction to Information and Coding Theory	3	34	74		108	graduate test	KNRTU-KAI (RIMT)	SB
Fundamentals of Embedded Systems	8	102	150	36	288	exam	KNRTU-KAI (RIMT)	SB
Processor Architecture	4	34	74	36	144	exam	KNRTU-KAI (RIMT)	Sp1
FPGA for Embedded System Design	4	34	74	36	144	exam	KNRTU-KAI (RIMT)	SB
Power-Aware Embedded Systems	4	34	74	36	144	exam	KNRTU-KAI (RIMT)	Sp1
Total	31	324	612	180	1116			
<i>High-level programming languages (Optional course)</i>	2	34	38		72	<i>graduate test</i>	<i>KNRTU-KAI (RIMT)</i>	-

2nd semester

Module	Credits of module	Contact hours	Individual work hours	Exams	Total student workload	Forms of final examination	Department	
1	2	3	4	5	6	7	8	9
Regression and Time Series Analysis	9	86	202	36	324	exam	KNRTU-KAI (RIMT)	FF
Foreign language	2	18	54		72	graduate test	KNRTU-KAI (FL)	SB
Machine Learning	8	86	166	36	288	exam	KNRTU-KAI (AIPSC)	Sp2
Fundamentals of Robotics	4	34	74	36	144	exam	KNRTU-KAI (RIMT)	SB
Embedded intelligence	4	34	74	36	144	exam	KNRTU-KAI (AIPSC)	Sp2
Scientific Publication	4	18	126		144	graduate test	KNRTU-KAI (RIMT)	SB
Total	31	276	696	144	1116			

3rd semester

Module	Credits of module	Contact hours	Individual work hours	Exams	Total student workload	Forms of final examination	Department	
1	2	3	4	5	6	7	8	9
Model-based Design of Embedded Systems	8	86	166	36	288	exam	TUKL	Sp1
Selected modules (2 of 4):	8	68	148	72	288	exam, exam	TUKL	-
<i>1. Bus Systems</i>	<i>4</i>	<i>34</i>	<i>74</i>	<i>36</i>	<i>144</i>	<i>exam</i>	<i>TUKL</i>	<i>Sp1</i>
<i>2. Safety and Reliability of Embedded Systems</i>	<i>4</i>	<i>34</i>	<i>74</i>	<i>36</i>	<i>144</i>	<i>exam</i>	<i>TUKL</i>	<i>Sp1</i>
<i>3. 3D Computer Vision</i>	<i>4</i>	<i>34</i>	<i>74</i>	<i>36</i>	<i>144</i>	<i>exam</i>	<i>TUKL</i>	<i>Sp2</i>
<i>4. OS-based programming of Embedded Systems</i>	<i>4</i>	<i>34</i>	<i>74</i>	<i>36</i>	<i>144</i>	<i>exam</i>	<i>TUKL</i>	<i>Sp1</i>

1	2	3	4	5	6	7	8	9
Seminar modules	4	18	126		144	graduate test	TUKL	Sp1
Project modules	8	18	270		288	graduate test	TUKL	Sp1
Total	28	190	710	108	1008			

4th semester

Module	Credits of module	Contact hours	Individual work hours	Exams	Total student workload	Forms of final examination	Department	
1	2	3	4	5	6	7	8	9
Master Thesis	30	32	1048		1080		KNRTU-KAI/ TUKL	MT
Total	30	32	1048		1080			

On behalf of TU Kaiserslautern

_____ Prof. Dr. Helmut J. Schmidt,
President

_____ Prof. Dr. Stefan DeBloch,
Dean of Department of Computer
Science

_____ Prof. Klaus Schneider,
Coordinator of the MSc Program

On behalf of KNRTU-KAI

_____ Prof. Albert Gilmutdinov,
Rector

_____ Prof. Adel Nadeev,
Director of Institute of Radioelectronics
and Telecommunications

_____ Prof. Yuri Evdokimov,
Coordinator of the MSc Program

Designations: CST – Computer Science Theory, FF – Formal Fundamentals, Sp1 – Specialization 1 “Embedded Systems and Robotics”, Sp2 – Specialization 2 “Intelligent Systems”, SB – Supplementary Block, MT – Master Thesis.