

*Joint Curriculum*

## Master of Science in Communications and Signal Processing

Participating Institutions: TU-Ilmenau (Germany) and KNRTU-KAI (Kazan, Russia)

Duration of Study: 2 years

Place for Study: 1<sup>st</sup> and 2<sup>nd</sup> semesters – at KNRTU-KAI, 3<sup>rd</sup> semester – at TU Ilmenau,  
4<sup>th</sup> semester – at KNRTU-KAI and/or TU Ilmenau

### 1<sup>st</sup> semester

Module	Credits of the Module	Contact Hours	Individual Work Hours	Exams	Total Student Workload	Cert	University
Philosophical and Psychological Problems of Creativity	3	14	58	36	108	exam	KNRTU
Psychology and Pedagogy of Higher School	2	14	58		72		KNRTU
Methods for Modeling and Optimization	3	28	44	36	108	exam	KNRTU
Theory of the construction of information and communication networks and systems	4	28	80	36	144	exam	KNRTU
Theory of optimal signal processing in information and communication systems	2	28	44		72		KNRTU
Information Theory and Coding	2	28	44		72		TU Ilmenau
Information Theory and Coding (Advanced Course)/ Methods for Modeling and Optimization (Advanced Course)	4	14	130		144		TU Ilmenau
Advanced Digital Signal Processing	2	28	44		72		KNRTU
Advanced Digital Signal Processing (Advanced Course)/ Theory of optimal signal processing in information and communication systems (Advanced Course)	2	14	58		72		KNRTU

<b>Research work</b>	<b>6</b>				<b>216</b>		<b>KNRTU and TU Ilmenau</b>
Total	30	196	560	108	1080		

## 2<sup>nd</sup> semester

<b>Module</b>	<b>Credits of the Module</b>	<b>Contact Hours</b>	<b>Individual Work Hours</b>	<b>Exams</b>	<b>Total Student Workload</b>	<b>Cert</b>	<b>University</b>
Multimedia Standards	2	10	62		72		KNRTU
Theory of electromagnetic compatibility of radio electronic equipment and systems	4	30	78	36	144	exam	KNRTU
Mobile Communications	2	20	52		72		KNRTU
Optical Communication Systems/ Radiophotonics (Advanced course)	2	10	62		72		KNRTU
Antenna Engineering / Radiophotonics / Theory of narrowband noise in optical communications systems	3	20	52	36	108	exam	KNRTU
MIMO Wireless Communications	2	20	52		72		TU Ilmenau
MIMO Wireless Communications (Advanced Course)	3	30	42		108	exam	TU Ilmenau
<b>Research work</b>	<b>12</b>				<b>432</b>		<b>KNRTU and TU Ilmenau</b>
Total	30	140	400	108	1080		

## 3<sup>rd</sup> semester

<b>Module</b>	<b>Credits of the module</b>	<b>Contact hours</b>	<b>Individual work hours</b>	<b>Exams</b>	<b>Total student workload</b>	<b>Cert</b>	<b>University</b>
UMTS Networks	4	30	78	36	144	exam	TU Ilmenau
Digital Audio Coding	3	20	88		108		TU Ilmenau
Advanced Topics in Communications and Signal Processing	3	30	78		108		TU Ilmenau
Measurements in Communications	3	30	42	36	108	exam	TU Ilmenau
Adaptive and Array Signal Processing	5	20	124	36	180	exam	TU Ilmenau

<b>Research work</b>	<b>12</b>				432		<b>KNRTU and TU Ilmenau</b>
Total	30	130	410	108	1080		

#### 4<sup>th</sup> semester

Module	Credits of the module	Contact hours	Individual work hours	Cert	Total student workload	University
Research work (Master thesis)	18					KNRTU and TU Ilmenau
Industrial practice (Master thesis)	3					KNRTU and TU Ilmenau
Research practice (Master thesis)	3					KNRTU and TU Ilmenau
Pedagogical practice (Master thesis)	3					KNRTU and TU Ilmenau
State exam	2			exam		KNRTU and TU Ilmenau
Masters thesis presentation and defense.	1					KNRTU and TU Ilmenau
Total	30					

\*) subject to modifications and amendments

**On Behalf of TU-Ilmenau**

12. FEB. 2014

Prof. Peter Schöff  
Rector



Prof. Martin Haardt  
Coordinator of the MSc Program

**On behalf of KNRTU-KAI**

Prof. Albert Gilmutdinov  
Rector



Prof. Adel Nadeev  
Coordinator of the MSc Program