

**KNRTU-KAI, Kazan, Russia**  
**DESCRIPTION OF THE PROMENG Curricula/Module**

TITLE OF THE MODULE	Code
Digital Data Transmission	M2.B.OJ.1

Teacher(s)	Department
<b>Coordinating:</b> Dr. Alexey A. Korobkov <b>Others:</b>	Radioelectronic and Telecommunication Systems

Study cycle	Level of the module	Type of the module
Masters	Second Semester	Compulsory

Form of delivery	Duration	Langage(s)
Laboratory works and practice	18 weeks	Russian

Prerequisites	
<p><b>Prerequisites:</b>            To know: accurate and approximate methods for calculating the bandwidth of network, the basic concepts of the theory of electrical link and data transmission, probability theory.            Can analyze network bandwidth using modern computers and software;            Possess: methods of modeling of telecommunication systems and networks, methods of calculating their bandwidth.</p>	<p><b>Co-requisites (if necessary):</b>            Students should have skills to work in mathematical software (Mathlab, MathCad and etc.)</p>

Credits of the module	Total student workload	Contact hours	Individual work hours
4	108	24	84

Aim of the module (course unit): competences foreseen by the study programme		
Students are to be able to develop systems, tools and methods of digital data transmission on the background noise		
Learning outcomes of module (course unit)	Teaching/learning methods	Assessment methods
To know: - principals of digital data transmission; - principals of data compression; - technologies and standards of digital data transmission;	Lecture	Interview
Can apply coding of data for compression and reduce of noise.	Case technology	Assessment of ability to solve the problem.
Possess: - methods of digital data transmission; - methods of information coding for compression and reduce of noise.	Case technology	Assessment of ability to solve the problem.

Themes	Contact work hours						Time and tasks for individual work		
	Lectures	Consultations	Seminars	Practiac work	Laboratory work	Placements	Total contact work	Individual work	Tasks
1. Principals of ADC and DAC.				1			1	14	Study of theoretical material.
2. Stochastic analysis of information				1	4		5	15	Study of theoretical material. Stochastic analysis of information.

2. Coding of information.				2	4		6	15	Study of theoretical material. Coding the information.
3. Principals of error-correction coding theory				2	4		6	15	Study of theoretical material. Coding the information using error-correction coding.
4. Digital modulation for data transmission				2			2	15	Study of theoretical material. Analysis of various methods of digital modulation.
5. Technologies and standards of digital data transmission				4			2	15	Study of theoretical material.
<b>Iš viso</b>				<b>12</b>	<b>12</b>		<b>24</b>	<b>84</b>	

Assessment strategy	Weight in %	Deadlines	Assessment criteria
Running control 1	30	7 <sup>th</sup> week	Attendance, activity, study cases
Running control 2	30	14 <sup>th</sup> week	Attendance, activity, study cases
Final exam	40	18 <sup>th</sup> week	Writing test

Author	Year of issue	Title	No of periodical or volume	Place of printing. Printing house or internet link
<b>Compulsory literature</b>				
Гашков С.Б.	2010	Криптографические методы защиты информации : учеб. пособие для студ. вузов / С.Б. Гашков, Э.А. Применко, М.А. Черепнев .- М.: Академия, 2010.	68	Читальный зал 7 учебного здания КНИТУ-КАИ
Оппенгейм А.	2009	Цифровая обработка сигналов / А. Оппенгейм, Р. Шафер.- 2-е изд., испр. .- М.: Техносфера	30	Читальные залы 1, 5 учебных зданий КНИТУ-КАИ
Алексеев Е.Б., Гордиенко В.Н., Крухмалев В.В.	2008	Проектирование и техническая эксплуатация цифровых телекоммуникационных систем и сетей : учеб. пособие для студ.- М.: Горячая линия - Телеком.	28	Читальные залы 1, 5 учебных зданий КНИТУ-КАИ
Елисеев С.Н.		Беспроводные сети передачи данных : учеб. пособие для студ. вузов / С.Н. Елисеев.- М.: САЙНС-ПРЕСС, 2008.	15	Читальные залы 1, 5 учебных зданий КНИТУ-КАИ
<b>Additional literature</b>				
Рабинер Л., Гоулд Б.	1977	Теория и применение цифровой обработки сигналов. М.: Мир	3	Читальные залы 1, 5 учебных зданий КНИТУ-КАИ
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