

Discipline annotation

Документ подписан простой электронной подписью Информация о владельце: ФИО: Петренко Вячеслав Иванович Должность: директор Института цифрового развития Дата подписания: 28.03.2024 14:31:33 Уникальный программный ключ: b47f96ee6a5a16e179f94dbf7fb0b10000e7ad4d	Discipline name Математические методы теории передачи сигналов / Mathematical methods of signal transmission theory Summary General information about communication systems. Discretization and quantization of analog signals. Representation of discrete signals in the frequency and pulse domain. Message encoding. Coding of discrete messages. Coding of continuous messages. Spatial representation of messages, signals and interference. Spectra of final signals. Mathematical representation of harmonic signals. General information about communication channels. Solving the problem of passing signals through deterministic linear circuits. Solving the problem of passing signals through nonlinear circuits. Mathematical models of continuous and discrete communication channels. Mathematical models of an ideal continuous communication channel and communication channels with noise. Equations of state. Markov models of communication channels. Basic principles of transmission of discrete messages in continuous channels. Partitioning the space of received oscillations into non-intersecting regions. Construction of the optimal decision circuit of the receiving device. Algorithms for receiving signals with deterministic distortions. Construction of an optimal partition of the space of received oscillations. Construction of an optimal demodulator with precisely known signals. Noise-correcting coding. Linear binary block codes. Systematic codes. Basic information about the theory of transmission of continuous messages. Evaluation of the fidelity of the transmission of continuous messages. Optimal linear filtering when transmitting continuous messages.
Learning outcomes of the discipline	- able to monitor the operation of communication means of telecommunication networks, protection of facilities and communication means of telecommunication networks against unauthorized access - determines the technical channels of information leakage arising due to side electromagnetic radiation and pickup from the main technical means, due to interference of information signals on the power supply and electrical grounding circuits of the main technical means and systems, auxiliary technical means and systems, their cable communications, as well as those created by the method "high-frequency exposure" of the main technical means and systems and due to the possibly introduced electronic devices for intercepting information in the main technical means; - configures secure technical means of information transmission; - conducts testing of secure technical means of information transmission
Workload, c. u.	3 c. u.
Reporting Forms	Credit - 5th semester
List of essential and supplementary literature necessary for mastering the discipline	
Essential literature	1. Solonina A. I. Digital signal processing. Modeling in Simulink: textbook for universities. - St. Petersburg: BHV-Petersburg, 2014. - 425 p. Stamp: recommended by the AMA. 2. Panin V. V. Fundamentals of information theory: textbook. – M.: BINOM. Knowledge Laboratory, 2013. - 438 p. Stamp: recommended by the AMA
Supplementary literature	1. B. B. Samsonov, E. M. Plokhov, A. I. Filonenkov, T. V. Krechet "Theory of information and coding" Phoenix 2018. 2. Litvinskaya O. S. Fundamentals of the theory of information transmission: textbook / O. S. Litvinskaya, N. I. Chernyshev; Feder.

	agency for education (Rosobrazovanie), Penza state technol. acad. - Penza: Penza State Technological Academy, 2016. - 130 p. 3. Grinchenko A. G. Information Theory and Coding: study guide. - Kharkov: KPU, 2013. 4. Tsymbal V. P. Information theory and coding. – M.: Vysshaya shkola, 2014. 5. Kudryashov B. D. Information theory. Textbook for universities. PITER Publishing house, 2015. - 320 p.
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