

Документ подписан простой электронной подписью
 Информация о владельце:
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 Должность: и.о. директора Института цифрового развития
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Discipline annotation

Discipline name	
Информационные технологии и программирование / Information technologies and programming	
Summary	Modern programming technologies; software quality assessment; general principles, methods and tools for designing architecture and structure, designing logic, testing and debugging, documenting and maintaining software, taking into account the increased requirements for the reliability of programs and their protection from unauthorized access; features of the development and maintenance of software for working groups and in terms of paraprogramming; CASE-technologies, technologies of virtual programming and object-oriented programming; application of mathematical methods in the design of reliable and secure software: functional programming, logic programming, Dijkstra's analytical programming; data structure and data abstractions; elementary and simple data structures; complex data structures; evaluation of the algorithms complexity; calculation models; sorting algorithms, search algorithms; graph algorithms; generation of random sequences; substitution algorithms; parallel algorithms: methods for designing parallel algorithms, the use of transputers in the implementation of parallel algorithms, complexity estimates.
Learning outcomes of the discipline (module)	- searches, selects and systematizes information to determine alternative options for strategic solutions in a problem situation - applies the main methods in the development of algorithms (recursion, backtracking, branch and bound method, analysis of arithmetic expressions); basic structures and data types; terminology of the discipline; libraries of standard programs - breaks the solution of a complex problem into a sequence of simpler problems; uses basic algorithms on dynamic data structures - able to create programs in general-purpose languages; apply programming methods and tools to solve professional tasks; make a reasonable choice of programming tools and ways of organizing programs
Workload, c. u.	8c. u.
Reporting Forms	Exam - 1,2nd semester
List of essential and supplementary literature necessary for mastering the discipline	
Essential literature	1. Kaufman V. Sh. Programming languages. Concepts and principles. - M.: DMK Press, 2018. - 464 p. - ISBN: 978-5-94074-622-5 2. Kharin V. N., Kushcheva I. S. Informatics. Programming languages. In 2 parts. Part II. Application programming in the Microsoft QBX environment. Tutorial. - Voronezh: Voronezh State Forest Engineering Academy, 2019. - 127 p. - ISBN: 978-5-7994-0281-5 3. V. V. Podbelsky. The C++ language / V. V. Podbelsky. - 5th ed. - M.: Finansy I statistika, 2020 - 560 p.
Supplementary	1. Kharin V. N., Kushcheva I. S. Informatics. Programming languages. In 2 parts. Part I.

literature	Basic concepts of programming languages. Textbook - Voronezh: Voronezh State Forest Engineering Academy, 2013. - 79 p. - ISBN: 978-5-7994-0281-5 2. Schildt, G. Theory and practice of C ++: Transl. from English. / Herbert Schildt. - St. Petersburg. : BHV-Petersburg, 2014. - 416p. - ISBN 0-07-882209-2. - ISBN 5-7791-0029-2 3. Wirth, N. Algorithms and data structures: transl. from German. - M.: Mir, 2014. - 360 p. - ISBN 5-03-001045-9. - ISBN 0-13-022005-1
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