

Документ подписан простой электронной подписью
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Дата подписания: 22.10.2026 13:25:38
Уникальный программный ключ:
990bea3aeec48c23bd8699e48288f8d1960e600

MINISTRY OF SCIENCE AND HIGHER EDUCATION OF THE RUSSIAN FEDERATION
Federal State Autonomous Educational Institution
Higher Education
"NORTH CAUCASUS FEDERAL UNIVERSITY"

APPROVED BY
Acting Director of the Institute
Advanced Engineering
A.A. Porokhnya

DISCIPLINE ASSESSMENT TOOLS FUND
"Object-Oriented Programming"

Field of study	11.03.02 Infocommunication Technologies and Communication Systems
Profile	Intelligent Data Processing in Infocommunication Systems and Networks
Year of start of training	2026
Form of study	Full-time
Implemented in a semester	3

Introduction

1. Purpose: FAT is designed to objectively assess the level of competence formation.
2. FOS is an appendix to the program of the discipline "Object-Oriented Programming".
3. Developer Voronkin R.A., Associate Professor of the Department of Infocommunications.
4. An examination of the FOC was carried out.

Members of the expert group:

Chairman: N.Y. Bratchenko, Chairman of the CMT of the Institute of Advanced Engineering, Associate Professor of the Department of Digital, Robotic Systems and Electronics of the Institute of Advanced Engineering.

Members of the Commission:

V.P. Mochalov, Professor of the Department of Digital, Robotic Systems and Electronics of the Institute of Advanced Engineering.

S.V. Melnikov, Senior Researcher of the Interdisciplinary Training and Research Center for Agricultural Technologies, Associate Professor of the Department of Digital, Robotic Systems and Electronics of the Institute of Advanced Engineering.

Representative of the employer's organization:

Mironov V.A., General Director of Orintex LLC.

Expert opinion: The FAT for the discipline allows you to assess the level of competence formation. Start approbation.

5. The validity period of the FAT is determined by the period of implementation of the educational program.

1. Description of indicators and assessment criteria at various stages of their formation, description of assessment scales

Competency(s), indicator(s)	Levels of competence formation(s),			
	The minimum level has not been reached (Unsatisfactory) 2 points	Minimum level (satisfactory) 3 points	The minimum level has not been reached (Unsatisfactory) 2 points	High level (excellent) 5 points
Competence: OPK-3				
Learning outcomes in the discipline (module): <i>Indicator:</i> ID-3 OPK-3 is able to solve data processing problems using computer technology.	Does not solve the problem of data processing using computer technology using the Python language	Poorly solves the problem of data processing using computer technology, using the Python language	Solves the problem of data processing with the help of computer technology using the Python language	Clearly solves the problem of data processing using computer technology using the Python language
OPK-4				
ID-4 OPK-4 is able to use the capabilities of computer technology and software to solve problems of control and algorithmization of information processing processes.	Does not use the capabilities of computer technology and software to solve problems of control and algorithmization of information processing processes, does not use the Python language to solve problems of information processing	Poorly uses the capabilities of computer technology and software to solve problems of control and algorithmization of information processing processes	Basically, he correctly uses the capabilities of computer technology and software to solve problems of control and algorithmization of information processing processes	It fully uses the capabilities of computer technology and software to solve problems of control and algorithmization of information processing processes
OPK-5				
ID-2 OPK-5 is able to read the codes of software products written in mastered programming languages and make the required changes.	Cannot read the code of software products written in mastered programming languages, and does not make the required changes	He reads the codes of software products written in mastered programming languages, and does not make the required changes, making significant mistakes	Reads the codes of software products written in mastered programming languages and does not make the required changes, making minor mistakes	Competently reads the codes of software products written in mastered programming languages, and does not make the required changes
ID-3 OPK-5 has the skills to develop original algorithms	Has difficulty developing original algorithms	Makes serious mistakes in the development of	Mainly accurately develops original algorithms and	Competently develops original algorithms and

and computer programs suitable for practical use.	and computer programs suitable for practical use	original algorithms and computer programs suitable for practical use	computer programs suitable for practical application. Can make minor mistakes.	computer programs suitable for practical use
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ASSESSMENT TOOLS FOR CHECKING THE LEVEL OF COMPETENCE FORMATION

Number Quests	Correct answer	Content of the question	Competence
Semester <u>3</u>			
		What is the object-oriented approach and how does it differ from the procedural approach in programming?	PC-2
		What are the basic principles behind the object-oriented approach?	PC-2
		What are the advantages of the object-oriented approach compared to other approaches in programming?	PC-2
		What is a class in object-oriented programming and how is it used?	PC-2
		What are the basic principles of inheritance in object-oriented programming?	PC-2
		What is polymorphism in object-oriented programming and how is it used?	PC-1
		What are the main types of relationships between objects in object-oriented programming?	PC-1
		What constructs in object-oriented programming are used to provide encapsulation?	PC-1
		How can the object-oriented approach be used in areas other than programming?	PC-1
		What are the drawbacks and limitations of the object-oriented approach to programming and how can they be overcome?	PC-1
	3	What is the principle of the object-oriented approach that describes the ability of objects of different classes to have the same methods with the same names but with different implementations? a) Encapsulation 2) Inheritance 3) Polymorphism 4) abstraction	PC-1
	4	Which of the following constructs provide encapsulation in object-oriented programming? a) Classes and objects 2) Variables and Methods 3) abstract classes and interfaces 4) Keywords: public, private, protected	PC-1

	2	What is the principle of the object-oriented approach that describes the ability of classes to inherit the properties and methods of other classes? - Encapsulation - Inheritance - Polymorphism - abstraction	PC-2
	3	Which of the following constructs provide polymorphism in object-oriented programming? - Classes and objects - Variables and Methods - abstract classes and interfaces - Keywords: public, private, protected Answer: 3	PC-1
	a	What is a constructor in object-oriented programming? - A method that is called automatically when a class object is created - A method that allows you to change the values of class variables - A method that allows you to obtain the values of class variables - A method that performs a certain function when called Answer: a	PC-2
	3	Which of the following constructs are used to describe interfaces in object-oriented programming? - Classes and objects - Variables and Methods - abstract classes and interfaces - Keywords: public, private, protected	PC-1
	2	What is method overloading in object-oriented programming? - The ability of classes to inherit the properties and methods of other classes - The ability of classes to have multiple - The ability of classes to create objects of other classes - The ability of classes to change the properties and methods of other classes	PC-1

	3	Which of the following constructs are used to describe abstract classes in object-oriented programming? a) Classes and objects 2) Variables and Methods 3) abstract classes and interfaces 4) Keywords: public, private, protected	PC-1
	1, 2, 3, 5	Which of the following statements apply to the basic principles of the object-oriented approach? a) Encapsulation 2) Inheritance 3) Polymorphism 4) Compilation 5) abstraction	PC-2
	2	What is inheritance in object-oriented programming? a) The process of creating a class object 2) The ability of classes to inherit the properties and methods of other classes 3) The ability of classes to have multiple methods with the same name but with different parameters 4) The process of converting program code into machine code	PC-1
	4	What is an interface in object-oriented programming? a) A class that cannot be used to create objects 2) A method that is called automatically when a class object is created 3) A class that inherits the properties and methods of other classes 4) Description of the set of methods to be implemented in the class	PC-2
	3	Which of the following principles of the object-oriented approach describes the possibility of using a class object instead of a base class object? a) Encapsulation 2) Inheritance 3) Polymorphism 4) abstraction	PC-1
	3	Which of the following constructs are used to describe abstract methods in object-oriented programming? a) Classes and objects 2) Variables and Methods	PC-1

		3) abstract classes and interfaces 4) Keywords: public, private, protected	
	a	Which of the following activities provide encapsulation in object-oriented programming? a) Use of the keywords public, private, protected 2) Creating Class Features 3) Inheritance of properties and methods of other classes 4) Definition of abstract classes	PC-1
	2	Which of the following operators is used to create a class object in object-oriented programming? a) class 2) new 3) function 4) this	PC-1
	3	Which of the following principles of the object-oriented approach describe the possibility of dividing the behavior of objects into different classes? a) Encapsulation 2) Inheritance 3) Polymorphism 4) abstraction	PC-2
		What is an object in object-oriented programming?	PC-3
		What are the basic principles behind object-oriented programming?	PC-3
		What is a class in object-oriented programming?	PC-3
		What kinds of class-to-class relationships exist in object-oriented programming?	PC-3
		What is encapsulation and how is it implemented in object-oriented programming?	PC-3
		What is inheritance and how is it used in object-oriented programming?	PC-3
		What is polymorphism and how is it implemented in object-oriented programming?	PC-3
		What is an interface in object-oriented programming and how is it used?	PC-3
		What is an abstract class and how is it used in object-oriented programming?	PC-3
		What are the advantages of object-oriented programming over procedural programming?	PC-3
	1	What is inheritance in object-oriented programming? a) This is the process of creating a new class based on an existing class 2) This is the process of creating a new object on the basis of an already existing object	PC-3

		3) It is the process of creating a new method based on an already existing method 4) This is the process of creating a new variable based on an already existing variable	
	1	What is Encapsulation in Object-Oriented Programming? a) This is a mechanism that allows you to hide the internal state of the object 2) This is a mechanism that allows you to open the internal state of the object 3) This is a mechanism that allows you to change the internal state of the object 4) This is a mechanism that allows you to inherit the internal state of the object	PC-3
	1	What is polymorphism in object-oriented programming? a) This is the ability of objects of different classes to use the same method 2) It is the ability of objects of the same class to use different methods 3) This is the ability of objects of different classes to have the same methods 4) This is the ability of objects of the same class to have different methods	PC-3
	1	What is an interface in object-oriented programming? a) It is a set of methods that must be implemented by the class that implements the 2) It is a set of variables that must be implemented by a class that implements the 3) It is a set of methods that do not necessarily have to be implemented by the class that implements the 4) This is a set of variables that do not have to be implemented by the class that implements the interface	PC-3
	4	What is Encapsulation? a) A mechanism that allows you to hide the internal structure of the object and provides access to it only through certain methods. 2) Open representation of all object data in the program. 3) A property that allows an object to access the data of another object. 4) There is no right answer.	PC-3
	2	What is inheritance? a) The ability of an object to access the data of another object. 2) A mechanism that allows you to create a new class based on an existing one and add new properties and methods to it. 3) The process of packing objects into larger objects. 4) There is no right answer.	PC-3
	3	What is polymorphism? a) The ability of an object to access the data of another object. 2) The ability of the object to change its behavior depending on the context.	PC-3

		3) A mechanism that allows you to create a new class based on an existing one and add new properties and methods to it. 4) There is no right answer.	
	4	What is a class? a) A set of data united by a common essence and properties. 2) An instance of the object. 3) A method that can only be called inside a class. 4) There is no right answer.	PC-3
	2	What is abstraction in object-oriented programming? a) This is a way to hide the details of the object's implementation from the user 2) It is a way to represent an object in the form of a set of its properties and methods 3) It is a way to represent an object as a set of related objects	PC-3
	1	What is Encapsulation in Object-Oriented Programming? a) This is a way to hide the details of the object's implementation from the user 2) It is a way to represent an object in the form of a set of its properties and methods 3) It is a way to represent an object as a set of related objects	PC-3
	3	What is inheritance in object-oriented programming? a) This is a way to hide the details of the object's implementation from the user 2) It is a way to represent an object in the form of a set of its properties and methods 3) This is a way to create a new class based on an existing class	PC-3
	3	What is polymorphism in object-oriented programming? a) This is a way to hide the details of the object's implementation from the user 2) It is a way to represent an object in the form of a set of its properties and methods 3) This is a way of using the same method for objects of different classes	PC-3
	2	What is an interface in object-oriented programming? a) This is a way to hide the details of the object's implementation from the user 2) It's a way to define a set of methods that should be implemented in a class 3) It is a way of creating an object based on an already existing object	PC-3
	2	How do interfaces help implement abstraction in object-oriented programming? a) Interfaces allow you to hide the details of the object's implementation from the user 2) Interfaces define a set of methods that should be implemented in a class, which allows you to abstract away from the specific implementation of the class 3) Interfaces are used to create an object based on an already existing object	PC-3

	a	Which of the principles of OOP means that an object can be created on the basis of another object while preserving its basic properties and methods? a. Encapsulation 2. Inheritance 3. Polymorphism 4. Abstraction	PC-3
	4	Which of the following is not an example of a class in object-oriented programming? a. Cat 2. Car 3. Variable 4. Student	PC-3
		What is Encapsulation in Object-Oriented Programming?	PP-4
		What is inheritance in object-oriented programming?	PP-4
		What SOLID principles are used in object-oriented programming?	PP-4
		What is polymorphism in object-oriented programming?	PP-4
		What design patterns are often used in object-oriented programming?	PP-4
		What is an interface in object-oriented programming?	PP-4
		What are the advantages of using objects in programming?	PP-4
		What is an abstract class in object-oriented programming?	PP-4
		What features of object-oriented programming distinguish it from procedural programming?	PP-4
		What is composition in object-oriented programming?	PP-4
	a	What is inheritance in object-oriented programming? a. A mechanism that allows you to create a new class based on an existing one. 2. A mechanism that allows you to add new methods to an existing class. 3. A mechanism that allows you to create new objects based on existing ones.	PP-4
	2	What is polymorphism in object-oriented programming? a. The ability of the object to process various types of data. 2. The ability of an object to have several forms (for example, the class of heir). 3. The ability of the object to communicate with the database.	PP-4
	a	What SOLID principles are used in object-oriented programming? a. Principles that allow for flexible and change-resistant programs. 2. Principles that allow you to create high-speed programs.	PP-4

		3. Principles that allow you to create programs that are easily maintained by other developers	
	2	What is an interface in object-oriented programming? a. A class that can only have static methods and fields. 2. A mechanism that allows you to combine methods from different classes into a single interface. 3. A class that cannot be the heir of other classes.	PP-4
	3	What is composition in object-oriented programming? a. A mechanism that allows the creation of new classes based on existing ones. 2. A mechanism that allows you to create new objects based on existing ones. 3. A mechanism that allows you to create complex objects from simple ones by incorporating one into another. Answer: 3.	PP-4
	3	What is polymorphism in object-oriented programming? a It is a property that allows an object to have its own methods and properties. 2 This is the ability of an object to use the methods and properties of another object. 3 It is the ability of an object to take on different forms in different situations. 4 It is the ability of an object to change its state. Answer: In	PP-4
	2	What is inheritance in object-oriented programming? a It is a property that allows an object to have its own methods and properties. 2 This is the ability of an object to use the methods and properties of another object. 3 It is the ability of an object to take on different forms in different situations. 4 It is the ability of an object to change its state.	PP-4
	4	What is Encapsulation in Object-Oriented Programming? a It is a property that allows an object to have its own methods and properties. 2 This is the ability of an object to use the methods and properties of another object. 3 It is the ability of an object to take on different forms in different situations. 4 It is the ability of an object to hide its inner realization.	PP-4
	2	What is a class in object-oriented programming? a This is the data type that allows you to create features. 2 It is a set of methods and properties that define the behavior of an object. 3 It is a set of objects that have common methods and properties. 4 It is the ability of an object to change its state.	PP-4

	4	What is a class in object-oriented programming? a This is the data type that allows you to create features. 2 It is a set of methods and properties that define the behavior of an object. 3 It is a set of objects that have common methods and properties. 4 It is the ability of an object to change its state.	PP-4
	3	What is Encapsulation in Object-Oriented Programming? a) Ability of objects to interact with each other 2) The ability of objects to store data 3) Hiding the details of the object implementation	PP-4
	3	What type of relationship between objects occurs with inheritance? a) Composition 2) aggregation 3) Generalization	PP-4
	3	What is operator overload in object-oriented programming? (a) Establishment of a new operator 2) Assigning a new priority to the operator 3) Define an operator to work with a custom data type	PP-4
	2	What is an abstract class in object-oriented programming? a) A class that does not have an implementation of one or more methods 2) A class that cannot be used to create objects 3) A class that has no fields	PP-4
	3	What is an interface in object-oriented programming? a) A class that does not have an implementation of one or more methods 2) The ability of objects to interact with each other 3) A contract that defines a set of methods that must be implemented	PP-4
	2	What is abstraction in object-oriented programming? a) it is the process of transforming an object into another object; 2) it is the process of simplifying the object by highlighting its main characteristics; 3) it is the process of inheritance of the properties of one object by another object.	PP-4
		What is object-oriented programming (OOP) and what benefits does it provide when developing applications in Python?	PP-4
		What are the basic OOP concepts in Python and how are they used to create objects and classes?	PP-4

		How can you create an instance of a class in Python, and what parameters can be passed when you create it?	PP-4
		How can you define the methods of a class in Python, and what parameters can they take?	PP-4
		What is class inheritance in Python and how is it used to create a class hierarchy?	PP-4
		How can you override the methods of the parent class in Python?	PP-4
		What is polymorphism in object-oriented programming, and how is it implemented in Python?	PP-4
		How can I import a module into Python, and what methods and functions can it contain for use in an application?	PP-4
		How can I use a module to extend the functionality of a Python application?	PP-4
		How can you write tests for your application in Python, and what methods and tools can be used to automate testing?	PP-4
	1	What are the principles of object-oriented programming (OOP) used in Python application development? a) Encapsulation, inheritance and polymorphism 2) Programming on functions and objects 3) Component Programming	PP-4
	1	What is a class in Python? a) A class is an object that contains variables and functions 2) A class is a function that contains variables and other functions 3) A class is an object that contains only variables	PP-4
	1	What is class inheritance in Python? a) This is the process of creating new classes from existing ones 2) It is the process of merging multiple classes into one 3) It is the process of instantiating classes	PP-4
	2	What is polymorphism in Python? a) This is the ability to create class instances 2) This is the ability to use the same method name in different classes 3) It is the ability to create new classes from existing ones	PP-4
	4	What Python modules are commonly used in the development of object-oriented applications? a) OS and SYS 2) tkinter и wxPython	PP-4

		3) 4 tasks and time 4) unittest и unittest	
	1	What is Encapsulation in Object-Oriented Programming? a) This is the ability of an object to hide its data from other objects 2) It is the ability of an object to present data in the form of a graphical interface 3) It is the ability of an object to store its data in a database	PP-4
	2	What is an abstract class in Python? a) A class that implements all methods 2) A class that only has methods, but no implementation for them 3) A class that has no methods	PP-4
	3	How can I create an instance of a class in Python? a) Using the create_instance() function 2) Using the new keyword 3) By calling the class name and parentheses	PP-4
	2	Which of the following operators is used to define a class in Python? a) def 2) class 3) var 4) object	PP-4
	3	How do I create a class object in Python? a) Using the def operator 2) Using the class operator 3) By calling the class name, e.g. obj = MyClass() 4) You can't create a class object in Python	PP-4
	1	What is a decorator in Python? a) A function that is called when a class object is created 2) A function that is called when an object of the class is destroyed 3) A function that executes when a class is initialized 4) A function that performs a given action in response to a certain event	PP-4
	1	How do I add a new method to an existing class in Python? (a) Change the code of the original class definition 2) Use the extend operator 3) Use the def operator 4) You can't add a new method to an existing class	PP-4

	1	What is class inheritance in Python? a) The process of creating a new class based on an existing class 2) The process of creating a new object based on an existing object 3) The process of creating a new variable based on an existing variable 4) The process of creating a new feature based on an existing feature	PP-4
	3	Which of the following access modifiers in Python means that a class member is only available within the class itself? a) pu2li3 2) prote3te4 3) Private 4) lo3al	PP-4
	4	What is polymorphism in object-oriented programming? a) Ability to use different types of data in one variable 2) Ability to create several objects of the same class 3) Ability to create a new class based on an existing class 4) The possibility of using the same method by different objects	PP-4
	2	What method is used to output information about a class object? a) repr() 2) str() 3) 3lass() 4) name()	PP-4

Description of the grading scale

Assessment of students' knowledge in each discipline is evaluated in the course of current control and intermediate certification. There is no rating system for assessing students' knowledge in this discipline. The principles of the rating system for assessing students' knowledge are based on the requirements described in the Regulation on the organization of the educational process based on the rating system for assessing students' knowledge at NCFU.

Criteria for assessing competencies

An "excellent" grade is given to a student if he/she fully and accurately performs the tasks of assessment tools in the discipline related to this competence (indicators of competence achievement), while demonstrating at a high level the ability to solve standard and non-standard applied practical problems of the physical foundations of telecommunications.

A grade of "good" is given to a student if he/she, making minor mistakes, performs the tasks of assessment tools in the discipline related to this competence (indicators of competence achievement), while demonstrating at an average level the ability to solve only standard applied practical problems of the physical foundations of telecommunications.

A "satisfactory" grade is given to a student if he/she performs the tasks of assessment tools in the discipline related to this competence (indicators of competence achievement), while demonstrating at a minimum level the ability to solve standard applied practical problems of the physical foundations of telecommunications.

An "unsatisfactory" grade is given to a student if he/she, performing the tasks of assessment tools in the discipline, does not reach the minimum level of competence formation ((indicators of competence achievement), while not demonstrating the ability to solve standard applied practical problems of the physical foundations of telecommunications, makes gross mistakes that he cannot correct even with the help of leading questions from the teacher.