Syllabus
«Intelligent web-services and service-oriented information systems»

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Expected learning outcomes
As a result of studying the discipline, the student
must know:

- basic provisions of service-oriented architecture;
- technologies for implementing a service-oriented approach;
- features of intellectualization of web services;
- mechanisms of coordinated interaction of web services;
- SOA and semantic technologies, grid and clouds.

***must be able to*:**

- define and describe the architecture of existing information systems with distributed information processing;
- to develop the architecture of service-oriented systems based on the interaction of web services;
- develop intelligent components of service-oriented systems that provide information processing.
- develop web services and ensure the organization of their coordinated implementation.
- analyse generalized performance indicators of web services.

Prerequisites
According to the educational program, it is necessary to first acquire knowledge in the following disciplines: "Higher mathematics", "Fundamentals of programming", "Object-oriented programming",

The scope of the discipline: 4 ECTS credits (16 hours of lectures, 32 hours of practice).

Purpose: familiarization of future masters in the field of information systems and technologies with the technologies of a service-oriented approach in the development of software for intelligent information systems and obtaining competences in the field of development of software solutions using a service-oriented architecture. All this is necessary for a graduate who has mastered the master's program to solve various tasks of practical and research activities.

The content of the discipline

Topic 1. Intelligent web services. Concept of intelligent service. The state of development of technologies of intelligent services. Modern technological approaches to building intelligent services.
Topic 2. Service-oriented architecture. Components and main features of COA. Modern technologies of COA implementation. Markup languages. Messaging protocols. Language for describing external interfaces of web services. UDDI is a universal recognition, description and integration interface.
Topic 3. Architecture of semantic web services. Semantic web services. Description of semantic web services in OWL-S, SAWSDL, SWRL syntax. Ontology description language OWL-S.
Topic 4. Technologies of integration and aggregation of web services. Basics of Mashup technology. Mashup applications. Mashup services. Technological means of developing mashup applications. Examples of Mashup systems and services.
Topic 5. Variants of application of mashup application technology. Use of mashup applications in SCM systems. Overview and analysis of Mashup tools.
Topic 6. Modelling the interaction of web services. Types of interactions of web services. A model approach to building interaction of web services. Algebra of services. Algebra of services operations. Basic designs, combined designs. Formal algebraic description of the structure of services.

"Probability theory and mathematical statistics", "Algorithms and data structures", "System analysis", "Methods and systems of artificial intelligence", "Organization of databases and knowledge".

Consequences
Competences, knowledge and skills acquired within the framework of studying this discipline can be applied to obtain reasonable research results and increase the scientific level of qualification work**.**

Technical support
Laboratory work on the discipline is conducted in computer classrooms using a software environment for simulation modelling of the interaction structure of CPN Tools web services. The latest version of the program can be downloaded from *http://cpntools.org/*.

Deadline Policy
Works that are submitted late without good reason will be assigned a lower grade**.**

Academic Integrity Policy
Provides independent performance of practices. Write-off (including using mobile devices) is prohibited. The work is not credited in case of detection of plagiarism or write-off.

Topic 7. Examples of building aggregated web services. Examples of building aggregated web services. Evaluation of the quality of aggregated web services. Analytical resources for evaluating the quality of aggregated web services.
Topic 8. Tools for building intelligent web services Simulation modelling of intelligent search web services based on the interaction model of their components.
Topic 9. Examples of implementation of intelligent web-services. Consideration of examples of implementation of intelligent web services for various industries (real estate web service, pharmaceutical web service, printing web service, and others). Analysis of generalized performance indicators of web services.

Evaluation criteria of laboratory works / practices / individual works / reports / projects
Maximum number of points – a student with high quality independently completed the entire amount of work, answers all questions related to the completed work, and makes additional calculations offered by the teacher. The teacher has no complaints about the implementation and requirements for the performance of the work.
Approximately 70%-99% of the maximum number of points – the student completed all tasks with sufficient quality, but in the process of work he made some mistakes, which, after being pointed out by the teacher, he corrected himself. He answers some questions incorrectly. Additional calculations proposed by the teacher are done with some effort. Not all requirements for performance of work are met.
Approximately 40%-69% of the maximum number of points – the student independently completed all the work, but the quality of the implementation is insufficient (calculation errors, not all work requirements are met). The answers to questions about the performance of work are not quite clear. There are mistakes in the answers.
Approximately 1%-39% of the maximum number of points – the student did not complete all the work independently, while the quality of the implementation was insufficient (errors in calculations, does not comply with the requirements for the design of the work). He does not answer questions about the performance of work clearly. There are gross mistakes in the answers.
0 points – the student did not complete the entire amount of work, or did it with gross errors. He has problems with calculations, does not know the theoretical material, the software implementation does not meet the requirements.