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|   | **Course Syllabus** |

**1.** **Course Title:**

Big Data Technology

**2. Academic Level:**

Master

**3. ECTS Credits:**

6 ECTS

**4. Semester:**

1 autumn semester

**5. School/Department:**

Institute of Computer Technologies and Information Security, Computer-Aided Design Department

**6. Location:**

Taganrog Campus, 44 Nekrasovsky Lane, Taganrog

**7. Instructor:**

Associate Professor Yury Kravchenko, email: yakravchenko@sfedu.ru

**8. Language of Instruction:**

English

**9. Course Description:**

The discipline belongs to the module of compulsory professional disciplines of the study program. This discipline is based on the basic knowledge, skills and abilities that are formed upon obtaining the previous level of education. The knowledge, skills and abilities formed by this discipline will be required when mastering the following elements of the study program, which are aimed at solving the problems of analysis and processing of big data.

**10. Course Aims:**

Course aims: formation of students' professional competence in the development and use of systems for processing and analyzing big data arrays. This goal correlates with the goal of the study program in terms of studying technologies for the development of specialized software systems responsible for processing big data.

**11. Specific entry requirements (if any):**

**12. Course Content:**

Specifics of the analysis and processing of large data sets, in terms of national information standards. Fundamentals of developing models, methods, algorithms, and hardware and software platforms for implementing Big Data projects. The MapReduce programming model and the Hadoop software platform. Basic solutions for building big data architectures. Composition and purpose of the main utilities of the software platform in Big Data technologies. Effective solutions of the world leaders in the IT industry and the field of Big Data.

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**13. Intended Learning Outcomes:**

Intended Learning Outcomes:

- knowledge of the analysis specifics and processing of big data arrays;

- mastered skills in developing models, methods, algorithms and software and hardware platforms for the implementation of Big Data projects;

- new approaches to searching for solutions in the field of building big data architectures;

- new skills in applying existing solutions in the field of big data processing.

**14. Learning and Teaching Methods:**

Lectures, practical classes, laboratory works.

The report on each practical task should contain a title page with the name of the task, the names of the students who completed it, the number of the group (subgroup), the name of the teacher; the purpose of the practical task; the progress of the task with the presentation of copies of images of monitor screens showing the main stages of the work performed. The evaluation of each practical task is carried out during the demonstration and explanation of the results.

Requirements for the content and formatting of the reports on the laboratory works. The report should contain the following: a title page with the name of the work, the names of the students who completed it, the number of the group (subgroup, team), the name of the teacher; the purpose of the laboratory work; the list of software and hardware tools used in the laboratory work; the progress of work with all the results of research and experiments in text or graphic form; processing of the results of research and experiments in accordance with the requirements of the task for performing laboratory work, conclusions on laboratory work.

**15. Methods of Assessment/Final assessment information:**

According to the course map, 16 points are allocated for practical tasks. The course contains 8 practical tasks. Each practical task is evaluated with a maximum of 2 points and a minimum of 1.

According to the course map, 24 points are allocated for laboratory work. Each laboratory work is evaluated with a maximum of 8 points. When evaluating the laboratory work, the following aspects are taken into account: active participation in the performance of laboratory work; compliance with the requirements for the content and formatting of the report on the performance of laboratory work, answers to questions in the process of defending the report on the performance of laboratory work.

The exam is conducted in oral format and requires a comprehensive answer to two theoretical questions.

**16. Reading List:**

**Main reading list.**

1. Gergel V. P. Technology for building and using cluster system: the course – http://biblioclub.ru/index.php?page=book&id=233768.

2. Korotkova O. A. Characteristics of AWP software tools and prospects for their development –http://biblioclub.ru/index.php?page=book&id= 142937.

3. Galatenko V.A. Mobile programming of real-time applications in the POSIX standard – http://biblioclub.ru/index.php?page= book&id=233766.

**Additional reading list.**

4. Demidova L. A., Kirakovsky V. V., Pylkin A. N. Decision-making under uncertainty – http://biblioclub.ru/index.php?page= book&id=253180.

5. Podkolzin A. S. Computer modeling of logical processes. Architecture and languages of the problem solver – http://biblioclub.ru/ index.php?page=book&id=68419.

6. Volodin K. I., Gulnitsky L. L., Pozharisky I. F., Churkin V. P., Yanbukhtin T. K. Automated system of scientific and technical information - development and operation – http://biblioclub.ru/ index.php?page=book&id=220229.