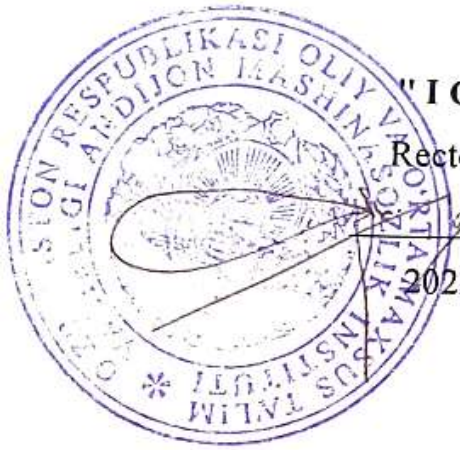
REPUBLIC OF UZBEKISTAN
MINISTRY OF HIGHER AND SECONDARY SPECIAL EDUCATION

ANDIJAN INSTITUTE OF MECHANICAL ENGINEERING



" I CONFIRMED "
Rector of the Institute
_____ U.M. Turdialiev
2022 "___" _____

CLOUD TECHNOLOGIES AND DATABASE SCIENCE CURRICULUM

Field of knowledge :	300000	- Production technical field
Field of study:	330000	- Computer technologies and informatics
Course of Study:	5330200	- Information systems and technologies (by networks and sectors)

Andijan - 2022

The science curriculum was approved by the report of the Scientific Council of the Andijan Mechanical Engineering Institute dated "___"_____, 2022 and approved by the Rector of the Andijan Mechanical Engineering Institute on "___"_____, 2022.

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I. _ Relevance of educational science and its role in higher professional education

One of the main subjects of the information technology field is Cloud technologies and database science. The main goal of cloud technologies and database science is to form students' knowledge about cloud technologies and database-based services. In the near future, cloud technologies and database-based services will be the most acceptable alternative to installing hardware and software. At the end of the course, students study current cloud technologies and database-based services and their differences from previous services, make a comparative conclusion, and develop a new cloud-based technology and database service.

II. The purpose and tasks of educational science

The purpose of teaching science is to introduce students to cloud technologies and database services and teach them how to use them in the modern world. During the training course, computer techniques, modern techniques for decision-making (in some cases optimal) in several different information systems: industrial, social, financial, robotics, etc. are considered. cloud technology and database science include society and various fields. The subject also studies search engine, intelligent systems, and service-oriented systems from a practical and theoretical perspective.

The tasks of the subject are to teach students the theoretical foundations of cloud technologies and databases, the basic concepts and categories of cloud technologies and databases, economic laws and principles, and to develop the ability to apply them in practice.

The following requirements are set for the knowledge, skills and qualifications of students in science :

The student should know:

- cloud technologies and database able to understand the basic concepts of the theory;
- cloud technologies and database understand the basic concepts used in their applications;
- b they can use the knowledge of cloud computing to analyze the problem, formulate a solution and find its solution in the processes of computing the national technologies and database ;

- cloud technologies and database they can learn how concepts appear in their theory and applications;

III. The main theoretical part (lecture sessions)

Topic 1. Organization of cloud technologies

Development of cloud technologies in Uzbekistan. Services provided by cloud infrastructure . The process of emergence of cloud technologies.

Topic 2. Creation and models of cloud technology

enables management of services in the field of IT services and Internet products. The introduction of a single platform for providing all types of cloud service services with advanced technologies opens the new data processing center to the possibilities of diversification of the product portfolio and wide opportunities that ensure the unquestionable superiority of the Uzbektelecom company in the market.

3rd topic . Cloud computing

Cloud computing. The development of cloud computing on a global scale.

4 - topic. Principles of cloud computing ecosystem development

A cloud ecosystem. SLA-based cloud computing organization features. Cloudy pyramid.

5 . Advantages and disadvantages of cloud technologies

Advantages of using cloud technologies. Disadvantages of using cloud technologies

Topic 6. Cloud service provision

Private cloud. Community cloud . Public cloud. Learning to organize a cloud education system

7th topic . Effective organization and management of cloud infrastructure components

These include data storage, Amazon S3, virtual server rental, provisioning of computing resources, Amazon EC2. Amazon S3 online web service

8 subject. Cloud infrastructure modeling

Cloud infrastructure modeling. Imitation approaches
Simulation models in the study of complex systems

9 - topic. Implementation of effective configuration of resources within SLA

SLA (Service Level Agreement), Service Quality The loss of organizational control is mainly due to human factors that create barriers to cloud computing.

10 - topic. A method of effective organization of network resources in cloud infrastructure

Load balancing (load balancer) located in the cloud system. In computers, load balancing is the distribution of the load among several computing resources, such as computers, networks, CPUs, or disks.

11 - topic. Oracle VM VirtualBox program

Concept of virtuality. The current reality in the world is new urgent issues and the need to solve them effectively

1 2 topic. Service models and key delivery providers

(SaaS) – software as a service .

SaaS-type provider - manages software placed in the cloud infrastructure , reliable operation

1 3 topic. Analysis of existing threats in cloud technologies and mechanisms to combat them

Cloud management and control - the main security issues All resources, virtual machines in cloud technologies.

1 4 topic. Hardware and software tools in cloud technologies, their application and application

Basic confirmation of hardware downtime, processing of confidential information in corporate networks, advantages of using hardware, quality assurance, reliability and endurance in the work process

1 5 topic. Comparative analysis of information threats and methods of combating them in cloud technologies

Functional attacks on cloud elements. This type of attack is common security with multi- layered cloud. Protection against functional attacks, DoS - providing effective protection against attacks,

1 6 topic. Features of cloud technology

Cloud technology models and the process of emergence

Cloud technologies. The importance of "virtualization" technologies in the emergence of cloud computing.

1 7 subject. Features and capabilities of Google Drive

(Google Drive is a cloud hosting where files can be stored.
An overview of the Dropbox application

1 8 subject. Mobile training. M-learning

Organization of independent education in M-learning. Effective organization of independent education.

1 9 topic. of "Database management systems".

goals and objectives

and tasks of science . Understanding of data bank. Database components. The database is the core of the data bank.

20 - topic. Informational aspects of the management system

The information aspects of the organization's management system, the process of information movement and re-formation, a set of blocks that make up the work structure of the management system. The control system in which the HIGH-level control unit and the external environment unit are described.

21 - topic. The methodology of constructing an infological model

Structure of processes and their composition in MBs. Database and its structure. MBiniz design stages. MBi creation processes.

22 - topic. Methodology of constructing an infological model

Information is a general understanding of the logical model. Sample MAMM. Information object of the subject field. Information objects. Information object structure. Functional dependencies of props.

23 - topic. Organizational work in creating a database

Organization of data in the machine environment has two stages - logical and physical. A method of placing data directly on the machine carrier. Organization of data using modern application programs. In applications and universal software tools, the user, as a rule, organizes data logically.

24 - topic. MB structure and classes

Classes of databases. Structure of centralized databases. Learning distributed databases. File-server and Client-server technologies.

25 - topic. A general definition of relational MBBT

Relational model data structures. Relational tables. Domain and tuples. Definition and basic concepts. Relational table - relationship. The schedule is the key to the relationship.

26 - topic. Database design in MBBT environment

Independent information array. Database. A database that is used by one person and many people. Tools for organizing and maintaining the information base inside the machine. Software tools for organizing and maintaining an information base.

27 . In an MBBT environment based on inventoried files
database design

should have structured and semantic information. Structured information depends on the appearance of relationships. Semantic information is a set of functional connections between the relational attributes expressed in the schema.

28 - topic. Database in MBBT using hierarchical model design

Network and hierarchical data model. Data structure in models. Relationship of objects in models. Features of the models. Comparison of models.

29 - topic. Creating a MB using a relational model

Work with tables. Identify key fields. Database normalization. Normal forms. 1,2,3 -normal forms. Defining data types. Connecting tables to each other

30 . Basics of SQL query language

SQL Query Language Concept, SQL Query Language Basics, SQL Query Structure, Basic Concepts of SQL Query Language. Basic command categories in the SQL query language.

31 . Implementation of relational model in MS ACCESS MBBT environment

Access data type. Work with tables. Constructor tables window. Identify key fields. Select and sort records using queries. Sample request. Creation of queries using "Master" and constructor.

32 . Implementation of relational model in MS ACCESS MBBT environment

Determining the areas to be counted. Creating complex queries. Creating forms for data entry. Automated creation of forms using a table or query.

IV. Instructions and recommendations for practical training

The following topics are recommended for practical training :

1. Subject area analysis. Defining requirements in services.
2. MBi creation processes.
3. Development of a comparative table of cloud services.
4. MB models.
5. Moving data from one place to another in the "Cloud" .
6. Choosing a virtualization solution.
7. File-server and Client-server technologies.
8. "Cloud" with mobile devices.
9. The concept of developing a new service based on cloud computing.
10. Development of new cloud computing based service using IBM Cloud, Windows Azure, Amazon Cloud and other platforms.
11. Designing an MB
12. Searching for on-demand online Cloud computing services.

stages .
13. Implementation of cloud services.
14. Relational models of MB, basics of relational models.
15. Classes of databases.
16. Structure of centralized databases.
17. Learning distributed databases.
18. Developing a security policy in the Cloud
19. MBBT Basic Concepts.
20. Principles of operation of MBBT.
21. Types of MBBT.

Practical training should be conducted by one professor-teacher per academic group in an auditorium equipped with multimedia devices. It is desirable that the classes are conducted using interactive methods and the necessary pedagogical and information technologies are used.

V. _ On **laboratory works instructions** and **recommendations.**

Advantages and Disadvantages of MBBTs

VI . On **the course work (project) . instructions** and **recommendations .**

The coursework (project) in science is not indicated in the curriculum

V II . Independent education and independent work

Recommended topics for independent study:

1. Google Cloud system
2. iCloud system
3. Mail.ru cloud
4. Microsoft One Drive system
5. AWS cloud service
6. MEGA cloud service
7. Cloud.uz service
8. Microsoft Azure
9. Yahoo service
10. Amazon cloud service.
11. Organizational work in creating a database.
12. A general definition of relational MBBT. Language tools.
13. Database design in MBBT environment.
14. Database design in MBBT environment based on inventory files.
15. Database Design in Hierarchical MBBT.
16. Implementation of relational model in MS ACCESS MBBT environment.

Students prepare and defend a Power Point presentation on independent study topics.

VIII. Basic and additional educational literature and information sources

Basic literature

1. Decision No. PK-1730 dated March 21, 2012 of the President of the Republic of Uzbekistan on "Further development of measures to support modern information and communication technologies".
2. Cloud computing - Chris Jamsa - Jones & Bartlett Publishers - 2011 - 322p.
3. Cloud computing: Principles and Paradigms - Raj Kumar Buyya, James Bromberg, Andrzej M. Goscinski - John Wiley & Sons - 2010 - 664p.
4. Cloud computing – Velte – McGraw-Hill Education (India) Pvt Limited – 2009.
5. Cloud computing: Technologies and Strategies of the Ubiquitous Data Center - Brian JS Chee, Curtis Franklin Jr. – CRC Press – 2010 – 288 p.
6. Cloud computing: Principles, Systems and Applications - Lee Gillam - Springer - 2010 - 400p.
7. Online Cloud computing Education – http://cloud.cit.ie/
8. Cloud computing Blog – http://cloudcomputing.blogspot.com/
9. Cloud computing bibl e - Barry e Sosinsky, Wil e y Publishing, Inc., Indianapolis, Indiana, USA, 2011.
10 . Cloud computing - Chris Jamsa - John e s & Bartl e tt Publish e rs - 2011 - 322p.
11. Cloud computing: Principles and Paradigms - Rajkumar Buyya, Jam e s Bro e rg, Andrz e j M. Goscinski - John Wil e y & Sons - 2010 - 664p.
12 . Cloud computing – World – McGraw -Hill Education (India) Pvt Limit e d - 2009

Additional literature

1. Constitution of the Republic of Uzbekistan - T.: Uzbekistan, 2014. - 46 p.
2. "Infrastructural information and communication technology management" (ICT Infrastructure Management) – Publication 2002 . _ _ _ _ _ _ _ (OG C)
3. Cloud computing: Technologies and Strategies of the Ubiquitous Data Center - Brian JS Chee, Curtis Franklin Jr. – CRC Press – 2010 – 288 p
4. Cloud computing: Principles, Systems and Applications - Lee Gillam - Springer - 2010 - 400p.

5. Professor Charles Fine Massachusetts Institute of Technology Sloan School of Management Cambridge, Massachusetts 02142, September 2010, Service Operations 6. Outline scope of services for the role of information management, CIC/INF MAN/S first edition 2013.

Internet sites

1. www.ziyonet.uz
2. www.library.tuit.uz
3. www.intuit.ru
4. http://www.searchengines.ru
5. http://e-tuit.uz
6. www.ibm.com/cloud-computing/us/en/
7. www.windowsazure.com
8. http://cloud.cit.ie/
9. http://cloudcomputing.blogspot.com/
10. http://gov.uz – the government portal of the Republic of Uzbekistan.