The syllabus of the discipline

Administration of information systems

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Field name	**Detailed content, comments**
Name of the faculty	Faculty of Infocommunications
Level of higher education	Second (master's)
Code and name of the specialty	172 Telecommunications and radio engineering
Type and name of educational program	EPP "Information and Network Engineering"
Name of the discipline	Administration of information systems
Number of ECTS credits	3,5
Discipline structure (distribution by types and hours of study)	32 hours - 16 lectures, 10 hours - 5 practical classes, 20 hours - 5 laboratory classes, 8 hours - 4 consultations, 64 hours - homework, type of control: credit
Schedule (terms) of studying the discipline	1-st year, I semester
Prerequisites for studying the discipline	Basic concepts of: discipline "Local Communication Networks", Network Technologies "
Competences, knowledge, skills, understanding, which is acquired by the applicant in higher education in the learning process	The discipline is used to form the following competencies: - be able to organize comprehensive management of users and resources of the information system and their security.
The quality of the educational process	Educational-methodical and material-technical resource provision of the educational program, within the framework of which the discipline is studied, meets the licensing requirements and accreditation conditions of the educational activity of the university. Annual monitoring and revision of the curriculum of the discipline in accordance with the requirements and recommendations of the Ministry of Education and Science, state certification of acquired competencies of graduates, standards of cooperation with employers to ensure a competitive level of training. Adherence to the principles of academic integrity (https://lib.nure.ua/plagiat). Contains public information on the requirements, competencies, level of education within the current educational program.

Description and content of the discipline

According to the qualification requirements for higher education in specialty 172 "Telecommunications and Radio Engineering" the purpose of the discipline is to form the basic knowledge of specialists in the principles of administration and management of information networks and systems using hardware, software routers and servers based on Windows Server and Linux server implementations.

Content

1. Introduction

Subject, purpose and objectives of the course. The concept of administration and management of information systems. The place of hardware and software routers, servers in administration. Functions of MOS and their types.

2. Windows Server 200x IP administration

2.1.General characteristics of MOS. Opportunities and implementation. File system.

2.2 Server resource management. Distributed file system. DFS. Replication. Network printing management.

2.3 Management of users and their resources in IP based on Active Directory. Domain administration.

2.4 Organization of routing in the IS. NAT Service, SNAT. Organization of virtual private networks.

2.5 Server functions of MOS. Administration of www and ftp services. Mail servers. DHCP, DNS servers.

3. Features of IP administration based on Windows Server 2008

Virtualization of server solutions. Basics of IP protection based on NAP. ISS services.

4. Linux / Unix-based IP administration

4.1 Features of server use of Linux / Unix distributions. Features of the file system. IP user and resource management. Process management.

4.2 Server use Linux / Unix. Network configuration on interfaces. Basic servers (www, ftp, dhcp, dns).

4.3 Routing in Linux / Unix. Iptables tables. Gateway organization. Protection of network services. SSH protocol.

5. Linux / Unix-based Windows IP administration

Basics of the Samba protocol. Administration of common resources. Windows Network Resource Management.

6. Long-term management of information systems (IS)

The specifics of the use of hardware routers in long-term IP administration. Dynamic and static routing. Access lists. Remote access protocols.

7. IP Security Management

7.1 IP security issues and ways to solve them at 1-4 levels of OSI (ARP, ICMP, IP, TCP, UDP).

7.2 Security of TCP / IP applications (DHCP, DNS, SMTP, FTP).

7.3 Batch filters, firewall. Construction of DMZ. Malware protection.

Learning outcomes of higher education

As a result of studying the discipline, students must:

- **KNOW:** the principles of administration of the main functions of network operating systems (MOS) in the information system, the use of management protocols;
- **BE ABLE**: to organize a comprehensive management of users and resources of the information system and their security.

Assessment system according to each task for passing the test / exam.

To evaluate the student's work during the semester, the final rating is calculated as the sum of grades for different types of classes and for control activities. Each laboratory work is evaluated in 10 points (4 points for attendance, 2 points for performance, 2 points for report, 2 points for defense). Each test task has 10 points. The credit rating is defined as the ratio of the obtained points to the highest value, which is given in the table. The maximum rating during the semester - 100 points, is defined as the average for three credits.

Types of classes / control event	**Rating**
Practical work № 1	3-5
Practical work № 2	3-5
Laboratory works № 1	3-5
Laboratory works № 2	3-5
Test work № 1	10-15
Checkpoint № 1	**6-15**
Practical work № 3	3-5
Laboratory works № 3	3-5
Laboratory works № 4	3-5
Test work № 2	8-15
Checkpoint № 1	**17-30**
Practical work № 4	3-5
Practical work № 5	3-5
Laboratory works № 5	3-5
Test work № 3	8-15
Checkpoint № 3	**21-25**
Total result	**50-100**

Qualitative evaluation criteria in the national scale and ECTS

Satisfactory, D, E (60-74). Show the required minimum of theoretical knowledge. Know the ways and methods of solving practical problems and be able to use them in practice.

Good, C (75-89). Firmly know a minimum of theoretical knowledge. Demonstrate the ability to solve a practical problem and justify all stages of the proposed solution.

Excellent, A, B (90-100). Show complete knowledge of basic and additional theoretical material. Unmistakably solve a practical problem, explain and justify the chosen method of solution.

Assessment scale: national and ECTS

<table>
<tr><td rowspan="2">The sum of points for all types of educational activities</td><td rowspan="2">ECTS assessment</td><td colspan="2">Score on a national scale</td></tr>
<tr><td>for exam, course project (work), practice</td><td>for offset</td></tr>
<tr><td>90 – 100</td><td>A</td><td>perfectly</td><td rowspan="5">credited</td></tr>
<tr><td>82-89</td><td>B</td><td rowspan="2">fine</td></tr>
<tr><td>74-81</td><td>C</td></tr>
<tr><td>64-73</td><td>D</td><td rowspan="2">satisfactorily</td></tr>
<tr><td>60-63</td><td>E</td></tr>
<tr><td>35-59</td><td>FX</td><td>unsatisfactory with the possibility of reassembly</td><td>not credited with the possibility of re-assembly</td></tr>
<tr><td>0-34</td><td>F</td><td>unsatisfactory with mandatory re-examination</td><td>not credited with compulsory re-study of the discipline</td></tr>
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Methodical support

Basic literature

1. Denys Kolysnychenko. Servernoe prymenenye Linux. – Spb: BKhV-Peterburh, 2009. – 497 s.
2. A. Kenyn. Praktycheskoe rukovodstvo systemnoho admynystratora. – Spb: BKhV-Peterburh, 2010. – 450 s.
3. Olyfer V.H., Olyfer N.A. Setevыe operatsyonnыe systemы. – Spb: BKhV-Peterburh, 2001. – 540 s.
4. A. Chekmarev, A. Vyshnevskyi. Windows Server 2003 v podlynnyke. – Spb: BKhV-Peterburh, 2001. – 1117 s.
5. Morymoto R. Microsoft Windows Server 2008. Polnoe rukovodstvo. – M.: «Vyliams», 2008. – 1392 s.

Supporting literature

6. Ed Tittel. Windows Server 2003 For Dummies. – Wiley: ISBN: 0764516337, 2003. – 432 p.
7. Dy-Ann Leblank, Melany Khouh, Эvan Blomkvyst. Linux dlia "chainykov". – M.: Dyalektyka, 2001. – 432 s.
8. Aleksandr Poliak-Brahynskyi. Admynystryrovanye sety na prymerakh. – Spb: BKhV-Peterburh, 2007. – 320 s.

Methodical instructions and literature for different types of classes

9. Metodychni vkazivky do laboratornykh robit z dystsypliny „Administruvannia informatsiinykh system» dlia studentiv spetsialnosti 7.092402 «Informatsiini merezhi zviazku» (v roboti)
10. Metodychni vkazivky do praktychnykh zaniat z dystsypliny „Administruvannia informatsiinykh system» dlia studentiv spetsialnosti 7.092402 «Informatsiini merezhi zviazku» (v roboti)
11. Metodychni vkazivky do samostiinoi roboty z dystsypliny „Administruvannia informatsiinykh system» dlia studentiv spetsialnosti 7.092402 «Informatsiini merezhi zviazku» (v roboti)

Information support

12. http://rus-linux.net/lib.php?name=MyLDP/BOOKS/books

13. http://citforum.ru/operating_systems/sos/contents.shtml

14. http://www.microsoft.com/rus/windowsserver2003/

15. http://www.linux.org.ru/