

FACULTY W-8 / DEPARTMENT.....

**SUBJECT CARD****Name in Polish** Zaawansowane sieci komputerowe**Name in English** Advanced Computer Networks**Main field of study (if applicable):** Computer Science**Specialization (if applicable):** Computer Engineering**Level and form of studies:** 2nd level, full-time**Kind of subject:** optional**Subject code** INZ0159W1**Group of courses** YES

|   | Lecture     | Classes | Laboratory           | Project | Seminar |
|---|-------------|---------|----------------------|---------|---------|
| Number of hours of organized classes in University (ZZU)                        | 30          |         | 30                   |         |         |
| Number of hours of total student workload (CNPS)                                | 60          |         | 120                  |         |         |
| Form of crediting   | Examination |         | Crediting with grade |         |         |
| For group of courses mark (X) final course                                      | X           |         |                      |         |         |
| Number of ECTS points   | 2           |         | 4                    |         |         |
| including number of ECTS points for practical (P) classes                       |             |         | 4                    |         |         |
| including number of ECTS points for direct teacher-student contact (BK) classes | 1,2         |         | 2,4                  |         |         |

\*delete as applicable

**PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES**

1. The student has a basic knowledge of computer networks and completed a course in this area.
2. The student has a basic knowledge of network operating systems and completed a course in this area.

**SUBJECT OBJECTIVES**

C1. Acquire theoretical principles for planning and configuration of selected network technologies and services in enterprise environment.

C2. Acquire practical skills for planning and configuration of selected network technologies and services in enterprise environment.

**SUBJECT EDUCATIONAL EFFECTS**

relating to knowledge:

PEK\_W01 – student has knowledge on selected network technologies and services.

relating to skills:

PEK\_U01 – student has basic skills in the planning and configuration of selected network technologies and services.

PEK\_U02 – student has the preparation necessary to work in computer laboratories and knows the rules of safety associated with this work.

| PROGRAMME CONTENT   |  |                 |
|---|--|-----------------|
| Form of classes – lecture   |  | Number of hours |
| Lec 1   | Introduction to network operating systems.                           | 2               |
| Lec 2   | Reference models: ISO/OSI and TCP/IP. Topologies.                    | 2               |
| Lec 3   | Switching and switches.  | 2               |
| Lec 4   | Address spaces and addressing in IP v. 4 and IP v. 6.                | 2               |
| Lec 5   | Routing and routers.   | 2               |
| Lec 6   | Routing protocols.   | 2               |
| Lec 7   | Dynamic Host Configuration Protocol (DHCP)                           | 2               |
| Lec 8   | Domain Name System (DNS).  | 2               |
| Lec 9   | Access to resources and data transmission in computer networks.      | 2               |
| Lec 10  | Network firewalls.   | 2               |
| Lec 11  | Security of network communication.                                   | 2               |
| Lec 12  | Computer networks in virtualization environments.                    | 2               |
| Lec 13  | Monitoring and troubleshooting.                                      | 2               |
| Lec 14  | Quality of Services (QoS).   | 2               |
| Lec 15  | Wireless communication. Fiber-optic communication.                   | 2               |
|   | Total hours  | 30              |
| Form of classes - laboratory  |  | Number of hours |
| Lab 1   | Introduction to laboratory.  | 2               |
| Lab 2   | Introduction to the Windows Server environment.                      | 2               |
| Lab 3   | Introduction to the Linux servers environment.                       | 2               |
| Lab 4   | Cables and connectors.   | 2               |
| Lab 5   | Address space planning issues.                                       | 2               |
| Lab 6   | Test – Address space planning.                                       | 2               |
| Lab 7   | Software routing in MS Windows Environment.                          | 2               |
| Lab 8   | Software routing in Linux Environment.                               | 2               |
| Lab 9   | Test – Software routing  | 2               |
| Lab 10  | Dynamic Host Configuration Protocol (DHCP) in MS Windows environment | 2               |
| Lab 11  | Dynamic Host Configuration Protocol (DHCP) in Linux environment      | 2               |
| Lab 12  | Test – DHCP service configuration.                                   | 2               |
| Lab 13  | Domain Name System (DNS) in MS Windows environment                   | 2               |
| Lab 14  | Domain Name System (DNS) in Linux environment                        | 2               |
| Lab 15  | Test – DNS service configuration                                     | 2               |
|   | Total hours  | 30              |
| TEACHING TOOLS USED   |  |                 |
| N1. Lecture<br>N2. Laboratories with access to server operating systems with administrative privileges.<br>N3. Contact hours.<br>N4. Student work – Preparation to laboratories.<br>N5. Student work – Preparation to Exam. |  |                 |

#### EVALUATION OF SUBJECT EDUCATIONAL EFFECTS ACHIEVEMENT

| Evaluation (F – forming (during semester), P – | Educational effect number | Way of evaluating educational effect achievement |
|--|---------------------------|--|
|--|---------------------------|--|

|                              |         |   |
|------------------------------|---------|---|
| concluding (at semester end) |         |   |
| F1                           | PEK_W01 | Examination. To pass, a student must earn more than half of the points available during the exam. The lecturer can award additional points for the activity during lectures during the semester. The F1 grade is the partial grade.                                     |
| F2                           | PEK_U01 | Points for each of test during semester. To pass, a student must earn more than half of the points available during the semester. The lecturer can award additional points for the activity during laboratories during the semester. The F2 grade is the partial grade. |
| F3                           | PEK_U02 | Mandatory participation in the training conducted by the lecturer. Pass on the basis of participation.  |
| P                            |         | The final grade for the group of courses is the arithmetic mean of F1 and F2. wherein the student must pass F1, F2, and F3, which means that both of the partial grades F1 and F2 must be positive and F3 passed..  |

### **PRIMARY AND SECONDARY LITERATURE**

#### **PRIMARY LITERATURE:**

- [1] Tanenbaum A.S.: Computer Networks, Prentice Hall, 2002.
- [2] Mir N. F.: Computer and Communication Networks, Prentice Hall, 2006.
- [3] Comer D.E.: Computer Networks and Internets with Internet Application, Prentice Hall, 2004.

#### **SECONDARY LITERATURE:**

- [1] RFC documents on <http://www.rfc-editor.org>
- [2] Technical documentation on <http://www.cisco.com>
- [3] Linux documentation project <http://tldp.org>
- [4] Technical documentation on <http://technet.microsoft.com>

#### **SUBJECT SUPERVISOR (NAME AND SURNAME, E-MAIL ADDRESS)**

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MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR  
SUBJECT  
**Advanced Computer Networks**  
AND EDUCATIONAL EFFECTS FOR MAIN FIELD OF STUDY  
**Computer Science**  
AND SPECIALIZATION **Computer Engineering**

| Subject educational effect | Correlation between subject educational effect and educational effects defined for main field of study and specialization (if applicable)** | Subject objectives*** | Programme content*** | Teaching tool number*** |
|----------------------------|---|-----------------------|----------------------|-------------------------|
| <b>PEK_W01 (knowledge)</b> | K2INF_W06   | C1                    | Lec 1-15             | N1,3,5                  |
| <b>PEK_U01 (skills)</b>    | K2INF_U08   | C2                    | Lab 1-15             | N2,3,4                  |
| <b>PEK_U02</b>             | K2INF_U09   |                       | Lab 1                | N2                      |

\*\* - enter symbols for main-field-of-study/specialization educational effects

\*\*\* - from table above