



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Signalling and devices in integrated networks [S1EiT1>SiUSZ]

### Course

|                                    |                   |
|------------------------------------|-------------------|
| Field of study                     | Year/Semester     |
| Electronics and Telecommunications | 4/7               |
| Area of study (specialization)     | Profile of study  |
| –                                  | general academic  |
| Level of study                     | Course offered in |
| first-cycle                        | polish            |
| Form of study                      | Requirements      |
| full-time                          | elective          |

### Number of hours

|           |                    |                     |
|-----------|--------------------|---------------------|
| Lecture   | Laboratory classes | Other (e.g. online) |
| 30        | 15                 | 0                   |
| Tutorials | Projects/seminars  |                     |
| 0         | 0                  |                     |

### Number of credit points

4,00

### Coordinators

prof. dr hab. inż. Grzegorz Danilewicz  
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### Lecturers

### Prerequisites

(S)he knows the taxonomy characterizing telecommunication and computer networks and understands the technical meaning of these terms (S)he can obtain information from literature, databases and other sources in Polish or English; is able to integrate the obtained information, interpret it, draw conclusions and justify opinions. (S)he can communicate in Polish or English in a professional environment. (S)he knows the limits of his own knowledge and skills, understands the need for further training

### Course objective

To teach students about the structure, functions and principles of operation of integrated networks and the services offered in these networks. Indication of different areas and levels of integration in ICT networks.

### Course-related learning outcomes

Knowledge:

1. (S)he has an ordered knowledge of the architecture and construction of integrated networks
2. (S)he has an ordered knowledge of the standards concern integrated networks
3. (S)he knows the directions of development of ICT networks

### Skills:

1. (S)he can identify problems in network operation in user access to the network
2. (S)he can check the correctness of operation of network devices in user access to the network
3. (S)he can assess the usefulness of specific solutions in terms of user requirements

### Social competences:

1. (S)he is aware of the importance of telecommunication networks in the functioning of society
2. (S)he knows the limitations of her/his own knowledge and skills, understands the need for further training

## Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

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Laboratories. The following components are assessed: the student's knowledge before the exercise, answers to questions during the exercises, written reports on the implementation of the exercises, written test at the end of the semester.

The final assessment from the laboratory is the result of the component assessments, where each of the component assessments must be positive. For the component grades and the final grade, a grading scale from 2 (unsatisfactory - negative) to 5 (very good) is used.

Lectures. Knowledge is verified during a written and/or oral exam. The written exam is a test of 40 to 60 questions with proposed four answers. Only one proposed answer is correct. Giving the correct answer is one point, incorrect answer is zero points. Mastering the knowledge sufficiently confirms obtaining more than 50% of the exam points.

## Programme content

### Lectures:

Specialized networks and their history, telecommunication networks and methods of information transfer in the network. Integrated services networks and principles of integration. Conditions for introducing digital networks with service integration. Signalling systems, subscriber signalling systems, inter-node SS7 signalling system, connections handling. Signalling in the mobile networks. Network nodes, central offices, switches, IP routers. Switching elements, switching fabrics. Contemporary solutions of integrated networks. Contemporary integrated services.

### Laboratories:

The principle of central office operation. Analysis of subscriber and inter-node signaling. The principle of operation of switching fabrics on the examples of space, time and space-time fabrics.

## Teaching methods

Lecture with the use of a whiteboard/projector, seminar lecture, experiment, text preparation.

## Bibliography

### Basic

1. W. Kabaciński, Standaryzacja w sieciach ISDN, Wydawnictwo Politechniki Poznańskiej, 2001
2. W. Kabaciński, M. Żal: Sieci Telekomunikacyjne, WKŁ, 2008.
3. G. Danilewicz, W. Kabaciński: System sygnalizacji nr 7, WKŁ, 2005.

### Additional

Asymmetrical Space-Conversion-Space SCS1 Strict-Sense and Wide-Sense Nonblocking Switching Fabrics

for Continuous Multislot Connections / Grzegorz Danilewicz (WEiT) // IEEE Access - 2019, vol. 7, s. 107058-107072

Supplement to "Asymmetrical Space-Conversion Space SCS1 Strict-Sense and Wide-Sense Nonblocking Switching Fabrics for Continuous Multislot Connections" - the SCS2 Switching Fabrics Case / Grzegorz Danilewicz (WEiT) // IEEE Access - 2019, vol. 7, s. 167577-167583

## Breakdown of average student's workload

|  | Hours | ECTS |
|--|-------|------|
| Total workload   | 100   | 4,00 |
| Classes requiring direct contact with the teacher  | 58    | 2,00 |
| Student's own work (literature studies, preparation for laboratory classes/<br>tutorials, preparation for tests/exam, project preparation) | 42    | 2,00 |