COURSE DESCRIPTION CARD - SYLLABUS

Course name
Monitoring and Assessment of Packet Network Efficiency [S1Teleinf1>MiOWSP]

Course

Field of study
Teleinformatics

Year/Semester
3/5

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
Polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
15

Laboratory classes
30

Other
0

Tutorials
0

Projects/seminars
0

Number of credit points

4,00

Coordinators

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Lecturers

Prerequisites

Students starting this course should have knowledge in the field of ICT networks, both local and extensive. They should also be able to configure network devices and have the ability to self-study. Students should be aware of the need to expand their competencies and be ready to cooperate as part of a team.

Course objective

1. Provide students with knowledge in the field of network performance assessment techniques: analytical, simulation, and measurement. 2. Acquainting students with the tools for monitoring and modeling telecommunications networks. 3. Developing students' skills to solve problems occurring in ICT networks

Course-related learning outcomes

Knowledge:
1. Students have a structured knowledge of packet network performance evaluation and measurement techniques
2. Students have a structured knowledge of packet network simulators
3. Students have basic knowledge about the implementation of services with differentiated quality of service

Skills:
1. Students are able to apply the techniques of network performance assessment to the modeling and design of computer systems and telecommunications networks
2. Students are able to carry out measurements of packet networks and process the obtained data to evaluate the performance of the network
3. Students are able to use the techniques of network monitoring and fault finding to effectively manage packet networks
4. Students can use a selected network simulator to evaluate the performance of packet networks

Social competences:
1. Students know the limits of their knowledge and skills, understand the necessity of further training
2. Students are able to adjust to the rules of teamwork

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

The knowledge acquired during the lecture is verified during an oral and / or written test.
Test issues, based on which questions are developed, are sent to students by e-mail and / or posted on the ekursy.put.poznan.pl website.
Passing threshold: 50% of points.
The skills acquired during the laboratory classes are verified on an ongoing basis. At each laboratory class, the correctness of the realization of the laboratory tasks is assessed on a scale from 2 to 5. The final grade is the average of the grades obtained from individual laboratory classes.

Programme content

1. Objectives and methods of network performance monitoring, modeling, and testing; network performance metrics
2. Basics of analytical modeling of single and multi-service networks.
3. Basics of simulation modeling of computer and telecommunication networks
4. Network telemetry
5. Monitoring and troubleshooting
6. Verification of SLA parameters
7. Network testing in line with ITU-T and IETF recommendations

Course topics

1. Objectives and methods of network performance monitoring, modeling, and testing; network performance metrics
2. Basics of analytical modeling of single and multi-service networks.
3. Basics of simulation modeling of computer and telecommunication networks
4. Network telemetry
5. Monitoring and troubleshooting of networks based on switches
6. Monitoring and troubleshooting routing and security solutions
7. Verification of SLA parameters
8. Network testing in line with ITU-T and IETF recommendations

Teaching methods

Lectures: multimedia presentations, illustrated with examples given on the blackboard.
Laboratory exercises: practical exercises in groups with the use of network devices and simulators

Bibliography

Basic:
1. Stasiak M., Głąbowski M., Zwierzykowski P.: Modeling and Dimensioning of Mobile Networks: from GSM to LTE, John Wiley and sons Ltd., January 2011
2. RFC 2544 „Benchmarking Methodology for Network Interconnect Devices”, https://tools.ietf.org/search/rfc2544
3. ITU-T Recommendation Y.1564: „Ethernet service activation test methodology”, ITUT, Geneva,

2016, https://www.itu.int/rec/T-REC-Y.1564/en

Additional:
1. Obaidat, Boudriga, "Fundamentals of Performance Evaluation of Computer and Telecommunication Systems ", 2010, Wiley, ISBN 978-0-471-26983
Breakdown of average student's workload
Hours ECTS
Total workload 86 4.0
Classes requiring direct contact with the teacher 45 2.0
Student’s own work (preparation for tests, preparation for laboratory 41 2.0
classes, literature studies)

Breakdown of average student's workload

	Hours	ECTS
Total workload	86	4,00
Classes requiring direct contact with the teacher	45	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	41	2,00