COURSE DESCRIPTION CARD - SYLLABUS

Course name

Infrastruktura i usługi chmur obliczeniowych - Cloud computing infrastructure and service

Course

Field of study
Teleinformatics

Year/Semester
1/1

Area of study (specialization)

Profile of study
general academic

Level of study
second-cycle studies

Course offered in
Polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
15

Laboratory classes
15

Other (e.g. online)

Tutorials
0

Projects/seminars
15/0

Number of credit points

3

Lecturers

Responsible for the course/lecturer:

dr hab. inż. Remigiusz Rajewski
Institute of Communication and Computer Networks
e-mail: remigiusz.rajewski@put.poznan.pl
tel.: 61 665 3818, room: P-207

Responsible for the course/lecturer:

Prerequisites

The student has a basic knowledge of ICT networks (network topologies, ICT node architecture) and the protocols used in ICT networks. The student also knows English at a level that allows obtaining information from English literature (books, catalog data, instructions, recommendations, etc.).
The student should read the technical data and guidelines needed for the proper configuration of devices in the ICT network from the English-language literature (books, recommendations, instructions, catalog data). Moreover, the student should be able to use various optimization methods to solve problems in ICT networks.
The student should know the limitation of his knowledge and skills and should understand his future education.

Course objective

The course aims to familiarize students with the subject of cloud computing, its configuration, the provision of various services, the storage and processing of user data, and the security of cloud computing.

Course-related learning outcomes

Knowledge

1. Knows simulation methods and ways of simulating traffic in communication networks.
2. Knows the protocols and tools used in cloud computing.
3. Knows the methods of storing information in the cloud, taking into account the security aspects of user data.
4. Knows the architecture of cloud computing and methods of their configuration.

Skills

1. Can read data from books, recommendations, producer catalogs, manuals, etc. for analysis and use in server and client applications for cloud computing.
2. Can write console programs and object-oriented applications in programming environments to support the client and server-side for cloud computing.
3. Can predict the effects of improper protection of user sensitive data in cloud computing.
4. Can independently acquire new knowledge, read recommendations, and configuration guidelines.

Social competences

1. He knows that he has to update his knowledge from time to time to be up to date.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

The condition for passing the course is to pass its individual parts: test from the lecture part, final test from laboratories, and final report on the project.
The condition for obtaining a positive final grade:
from the lectures is obtaining more than 50% of all possible points from the test. Each answer from the final test is assigned an appropriate number of points: -0.25 points for a wrong answer, 0 points for no answer, 1 point for a correct answer.

from the laboratories is obtaining more than 50% possible points from the final test.
from the project is to prepare the final report and the project's source codes or progress done in the on-line course (the teacher has possibility to watch the progress done by the student).

Programme content

1. Introduction (3h)
Organization and schedule of classes. Conditions for obtaining a pass. Basic information on the type of ICT networks and the location of computing clouds. Historical overview. Influence of civilization development on the way of working with data, their processing, and storage. Trends and changes in the approach to working with user data and its storage.
2. Fundamental Concepts and Models (2h)
The characteristic properties which are common to most cloud environments. Overview of different delivery and deployment models in the cloud.
3. Cloud-Enabling Technology (4h)
Broadband Networks and Internet Architecture. Virtualization Technology. Web Technology. Multitenant Technology. Service Technology. Data Center examples.
4. Cloud Infrastructure Mechanisms (2h)
Logical Network Perimeter. Virtual Server. Cloud Storage Device. Cloud Usage Monitor. Resource Replication. Ready-Made Environment.
5. Fundamental Cloud Security (2h)
Basic Terms and Concepts. Threat Agents. Cloud Security Threats.
6. Cloud Security Mechanisms (2h)
Encryption. Hashing. Digital Signature. Public Key Infrastructure. Identity and Access Management. Single Sign-On. Cloud-Based Security Groups. Hardened Virtual Server Images.

Teaching methods

Lecture: multimedia presentation, additional examples given in a web browser.
Laboratory: Introduction to the exercises, depending on the topic of the meeting, may be preceded by a multimedia presentation and/or examples provided by the tutor in a web browser. Each laboratory exercise has specially prepared instruction or a tutorial available on the software manufacturer's website. Some laboratory instructions also include additional questions related to the study topics.
Project: during the first (informational) meeting, the tutor discusses the topics of individual projects. Depending on the presented topic, the tutor uses a short multimedia presentation and/or a web browser.

Bibliography

Basic

[1] N. K. Sehgal, P. Ch. P. Bhatt: Cloud Computing: Concept and Practices, Springer, 2018.
[2] K. L. Jackson: Architecting Cloud Computing Solutions, Packt Publishing, 2018.
[3] N. B. Ruparelia: Cloud Computing, The MIT Press, 2016.
[4] R. Rafaels: Cloud Computing: From Beginning to End, CreateSpace Independent Publishing Platform, 2015.

[5] M. J. Kavis: Architecting the Cloud, Willey, 2014.

Additional

[6] T. Erl, R. Cope, A. Naserpour: Cloud Computing Design Patterns, Prentice Hall, 2015.
[7] A. Bahga, V. Madisetti: Cloud Computing: A Hands-On Approach, CreateSpace Independent Publishing Platform, 2013.

Breakdown of average student's workload

	Hours	ECTS
Total workload	86	3.0
Classes requiring direct contact with the teacher	45	2.0
Student's own work (preparation for tests, project preparation, preparation for laboratory classes, literature studies)	41	1.0