

VOICE SERVICES

Code: 322098

Main Scientific Area: Computer networks and architecture

Lecturer: Pedro Miguel da Silva Barbosa

Language of Instruction: Portuguese

Regime: S1

Contact Hours: 60h Total Workload: 108h

ECTS: 6,0

Objectives

This course aims to provide students with the concepts of voice services over IP networks, knowledge and practice of implementing SIP protocol and Unified Communications Systems.

It is intended to develop in students the skills of abstraction and communication and the practice in the use and implementation of business unified communications solutions in their IP networks.

Students will gain skills in the description, use and installation of voice services based on the SIP protocol integrated with video, data and instant messaging communications.

Learning Outcomes

At the end of the course, students should be able to: Describe the concept of Unified Communications System and its role in the organizational context; Describe the SIP protocol and its advantages; Describe the SDP protocol; Analyse callflows;

Demonstrate the ability to implement a corporate voice communications system based on the SIP protocol in IP networks; Analyze and model a unified communications system for voice, video, data;

Course Contents

Introduction to voice services, their evolution and fundamental concepts;
Signaling and transport protocols for voice, video and data on IP networks;
Digitalization of voice and codecs;
SIP and SDP protocol;
Security on VoIP/SIP;
SIP and the public switched telephone network;
Unified communications platforms based on Asterisk and FreeSwitch;
Service monitoring;

Videoconferencing Systems;

Practical work to implement a corporate unified communications system.

Recommended Bibliography

Johnston, Alan SIP - Understanding the Session Initiation Protocol 3th Edition; Puente, Gerardo, Elastix Unified Communications Server Cookbook. Sharif, Ben, Elastix Without Tears Hartpence, Bruce - Packet Guide to Voive over IP - O'Reilly Media, Inc

Learning and Teaching Methods

The integrated and progressive approach of the UC program will allow students to develop the knowledge and skills set out in the objectives, ensuring consistency between the syllabus.

Points 1 to 9 of the syllabus will allow knowledge and articulation of the concepts related to the technology of voice networks (VoIP). Practical work related to the content in question, which will be necessary for the preparation of the unified communications system requested in the final practical work (point 10 of the syllabus), will be carried out throughout the content exhibition.

Assessment Methods

Learning outcomes will be assessed through (a) a theoretical component and (b) a practical component. The theoretical component consists of individual written tests and the practical component in the development of a team project. The practical component must be carried out during the academic period with the accompaniment of the teacher and consists of 2 aspects: practical work and report of practical work.

The theoretical grade results from the evaluation of the written tests or, if the student has not been successful or has not reached the minimum grade in the theoretical component, corresponds to the exam grade. The final grade (FG) in continuous evaluation is the weighted average calculated according to the following expression:

$$FG = \text{Theoretical Grade} * 45\% + \text{Practical Grade} * 55\%$$

The completion of the curricular unit is subject to obtaining a minimum grade of 10 (scale from 0 to 20) applying the formula for calculating the Final Grade (FG).

At the time of the exam, only the theoretical component will be assessed, maintaining, for the purpose of calculating the final grade, the value obtained in the practical component during the attendance of the curricular unit, but with a weight of 30% in the final grade. Thus, at the time of the exam, the final grade is given by Final Grade (FG) = Theoretical Grade * 70% + Practical Grade * 30%

In the remaining evaluation periods, only the theoretical component will be evaluated, worth 100% of the final grade.