

CLINICAL SYSTEM INTEGRATION

Code: 12413

Main Scientific Area: Computer Architecture, Distributed Systems and Cybersecurity

Lecturer: João Pedro Barbosa da Silva

Language of Instruction: Portuguese

Regime: S1

Contact Hours: 60h Total Workload: 100h

ECTS: 6,0

Objectives

The Clinical Systems Integration Curricular Unit aims to provide students with contact with the problem of information systems integration, the application of communication technologies, data representation and validation, systems interoperability and information mapping, applied in the field of information in the clinical area, considering the administrative organization of hospital and local health units, as well as the protocols implemented and the nature of the information in the environment.

Learning Outcomes

Application of distinct and actual patterns and development technologies which support information systems integration, mainly in hospital and clinical context.

Course Contents

Clinical Systems Integration

Contextualization (concepts of interoperability between systems)

Health information systems (SNS entities and organization)

Systems Integration (Technologies, evolution)

HL 7 OpenEHR and DICOM Healthcare Interoperability Standards

Systems Interoperability

XML (DTD, XSL, XPATH)

JSON

Querying with LINQ (JSON, XML)

Other (e.g. CSV, YAML)

microservices architecture

WebServices

Service Oriented Architecture (SOA)

SOAP

REST

Tools

Extract Transform and Load (ETL) (eg MSSIS, Pentaho Data Integration)

Swagger (OpenAPI)

Recommended Bibliography

Material disponibilizado eletronicamente no Moodle;

Principles of Health Interoperability (Tim Benson et al 2012 [HL 7 SNOMED])

Open data models for smart health interconnected applications the exemple of openEHR Hans Dmski et al 2016
OpenEHR
Health Informatics on FHIR How HL 7 's New API is Transforming Healthcare Mark L Braunstein 2018))[HL 7
SQL Server 2017 Integration Services Cookbook Christian Cote et al 2017
Pentaho Kettle Solutions Build Open Source ETL Solutions with Pentaho Data Integration Matt Casters 2010
Data Integration Best Practices Jacob Horblulyk 2017
Mastering XSLT chapter 11))(ISBN 0 7821 4094 7 Chuck White 2002

Learning and Teaching Methods

The Communication and Information Technology area has been shown its relevance and potentiality. However, its application in solving complex real case problems is a delicate task and requires efficient strategies that ensure sustainability on choices made. The need and capacity to analyze carefully all involved variables comes from the System Architect responsibility. The students, being framed with real situations, problems, solutions, processes and technologies, could get involved and behave as so. Thus, from main interoperability patterns resultant from succeed and failed situations; from processes and technological architectures documented by literature; several used or exploration technologies, from web, to nowadays mobile development technologies and emergent cloud computing, ensure a real and actual context of systems architecture and interoperability perspective to the student.

Assessment Methods

The assessment will have two components

Theoretical (T) — 2 individual assessment tests

Practice (P) — Project carried out in groups
The dates of the assessment tests and project deliveries are published on Moodle, where the project statement will also appear.

Calculation of the final grade (FG):

$FG = T * (25\% + 25\%) + P * 50\%$, where T is the theoretical grade (tests or exams) and P the final grade of the project

The teacher reserves the right to carry out an oral defense of the grade obtained in the test. The oral defense test, when carried out, replaces the test grade.

The project must be developed during class time.

Project deliveries after the deadline defined in the statement are not considered.

The minimum grade for each component (theoretical and practical) is 10 values.

The theoretical component can be carried out by exam:

Those who did not pass the exam or did not reach the minimum grade in the theoretical component will be able to take the exam.

The calculation formula remains, where the theoretical component (T) is equal to the exam grade

Only the theoretical component can be subject to improvement in the exam.

The completion of the project ends with classes end, and it cannot be improved after!