Big and Chained Data

Academic Year: (2021 / 2022) **Review date: 07-06-2021**

Department assigned to the subject: Computer Science and Engineering Department

Coordinating teacher: GONZALEZ CARRASCO, ISRAEL

Type: Electives ECTS Credits : 3.0

Year : 1 Semester : 1

OBJECTIVES

- Possess and understand knowledge that provides a basis or opportunity to be original in the development and/or application of ideas, often in a research context.
- Students are able to apply their acquired knowledge and problem-solving skills in new or unfamiliar environments within broader (or multidisciplinary) contexts related to their area of study.
- Students should be able to communicate their findings and the ultimate knowledge and reasons behind them to specialist and non-specialist audiences in a clear and unambiguous manner.
- That students possess the learning skills that will enable them to continue studying in a largely self-directed or autonomous manner.

- Being able to develop new scientific/technological approaches in a corporate environment.
- Being able to communicate conclusions in clear and precise way.
- Being able to autonomously study and do research.
- Being able to do team-work and manage available time.

- Being able to develop computer software which solves mathematical problems using the most suitable computational environment in each case.
- Being able to design and implement more or less complex algorithms to solve real-life problems.
- Being able to perform mathematical modeling, as well as related computations and simulations, at technological and/or corporate engineering environments, in particular for research, development, and innovation tasks.
- Being able to model, design, define the architecture of, implement, manage, operate, administer, and maintain computing applications, networks, systems, services and contents.
- Being able to understand and apply advanced knowledge on numerical methods and computing to problems in science, technology, and society.
- Being able to know the peculiarities of data acquisition and information management.
- Acquire an innovative attitude and approach.
- Ability to undertake financial management of projects computer engineering fields related to factories software development, infrastructure and computer facilities (including networks), systems, applications and services, following quality and environmental criteria.
- Ability to design and develop computer systems, applications and services in embedded and pervasive systems.

Basic competences: CB6, CB7, CB9, CB10
General competences: CG3, CG5, CG6, CH7
Specific competences: CE5, CE6, CE9, CE10, CE11, CE12, CE14

DESCRIPTION OF CONTENTS: PROGRAMME

BLOCK 1. MASSIVE DATA INTEGRATION.
1.1. Integration of data sources.
1.2. Big Data for data integration and analysis.
1.3. Main applications.

BLOCK 2. BLOCKCHAIN.
2.1. Origin of Blockchain.
2.2. Blockchain operation.

2.3. Consensus algorithm.
2.4. Types of Blockchain.
2.5. Main applications.

LEARNING ACTIVITIES AND METHODOLOGY

- Theory lectures with the objective of acquiring specific competences. Slides and other material as well as reference books will be provided to students in order to complete knowledge of subjects. Moreover, standards and technology documentation concerning systems integration will also be provided. Inthis lectures, studentes will do talds about specific contents from complementary readings.
- Practical cases performed working cooperatively to complement theory lectures. Among other activities students will develop a solution to integrate applications using service oriented architectures.
- Academic activities guided by the teacher to solve specific problems about data and functional integration.
- Individual work consisting on developing solutions to exercises posed by the teacher as well as complementary readings

ASSESSMENT SYSTEM

In addition to serve as formative activity, the practical work serves to be used as evaluation measure. Students will develop in groups a practical case about an integration problem in a particular domain.
The assessment is:
Practical Case about applications integration:90%
Integration test 10%
Practical Case is mandatory

The extraordinary call is an exam with the 100% of subject grade

% end-of-term-examination:	10
% of continuous assessment (assigments, laboratory, practicals…):	90

BASIC BIBLIOGRAPHY

- Judith R. Davis and Robert Eve Data Virtualization Going Beyond Traditional Data Integration to Achieve Business Agility, Composite Software. , 2011
- AnHai Doan, Alon Halevy, and Zachary Ives Principles of Data Integration. , Morgan Kaufmann., 2012
- Bishop, Matt. Computer security : art and science, Addison-Wesley, 2003
- Daniel. Drescher Blockchain basics a non-technical introduction in 25 steps, Berkeley, CA , 2017
- Ross Anderson Security engineering : a guide to building dependable distributed systems, Wiley, 2008
- Trovati, M., Hill, R., Anjum, A., Zhu, S.Y., Liu, L. (Eds.) Big-Data Analytics and Cloud Computing, Springer, 2015

ADDITIONAL BIBLIOGRAPHY

- Philip Bernstein and Laura Haas, Information integration in the enterprise,, Communications of the ACM Vol 51, N 9, September 2008, Pages 72-79, 2008