

Academic Year: (2024 / 2025)

Review date: 26-04-2024

Department assigned to the subject: Telematic Engineering Department

Coordinating teacher: ALMENARES MENDOZA, FLORINA

Type: Compulsory ECTS Credits : 6.0

Year : 3 Semester : 2

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Programming
Systems Programming
Systems Architecture

OBJECTIVES

The main objective of this course is to provide the student with the knowledge, skills, and competences required to design and develop multimedia applications and websites using appropriate technologies (Web technologies, multimedia libraries and frameworks, and IDE).

To achieve this goal, the student must acquire the following competences:

1. Specific competences (ECRT13, ETEGISA1, ETEGISA5)

1.1. Cognitive: at the end of the course the student must be able to:

- Know HTML5 language for representing structured and multiplatform (multimedia) web content.
- Know CSS language for formatting web pages.
- Know Javascript language for introducing interaction and processing in websites.
- Understand languages for the description and animation of multimedia information, as well as their adaptation to Web environments.
- Know the structure of a multimedia application.
- Know specific libraries for programming multimedia applications.

1.2. Instrumental and practical competences: at the end of the course, the student is expected to be able to:

- Design and develop interactive and multimedia web pages.
- Insert and define the interaction with components in multiplatform, interactive applications.
- Create (design and program) multimedia applications.
- Use existing frameworks for creating multimedia solutions.

1.3. Attitudes: at the end of the course, the student should attain:

- A proactive attitude for contributing solutions for the design of multimedia applications.
- An attitude of collaboration as a means for solving complex problems.
- A creative attitude for the analysis and design of multimedia applications and interfaces.
- A cooperative attitude for managing a software project as a team.

2. General competences (CG1, CB1, CB2)

- Capacity to apply theoretical concepts.
- Collaborative teamwork.
- Ability to organize and plan the work for solving problems and fulfilling a given task.
- Ability to search and discriminate the information relevant to solving a given problem.
- Ability to create a system according to given requirements (analyze the requirements, design, develop and test the system) [This competence is particularly critical for the course]

DESCRIPTION OF CONTENTS: PROGRAMME

This course tackles the development of multimedia applications, considering both Web and standalone environments. Thus the syllabus is divided into two parts:

PART 1: Development of multimedia applications (Development of multimedia applications based on an open-source multimedia framework)

- 1.1. Basic concepts and architecture
- 1.2. Basic functionalities: capture, processing, presentation and storage of multimedia information
- 1.3. Communication and transmission of multimedia information: RTP

PART 2: Multimedia Web Applications (Multiplatform)

- 2.1. Representation of Structured and Multimedia Contents: HTML5
- 2.2. Format and Appearance: CSS
- 2.3. Processing: Javascript
- 2.4. Integration of multimedia streams in HTML5
- 2.5. Advanced aspects and other technologies

LEARNING ACTIVITIES AND METHODOLOGY

The learning methodology will include:

THEORY - lectures and exercises:

- Lectures for introducing the key concepts and knowledge that the students must attain. Lectures will also provide a space for discussion and solution of doubts that may rise during self-learning. Theoretical explanations will be complemented with appropriate examples. The students will be provided with class notes and references for completing and deepening topics of particular interest.
- Exercises solved by the student that will allow self-assessment and achieving the required learning outcomes. Self-study for correct assimilation of the information.
- Problem classes guided by the instructor with active participation by the students, in order to consolidate concepts and develop abilities.

PRACTICE - Lab sessions and Projects:

- Lab sessions in teams for developing collaborative abilities, teamwork, and problem-solving, applying the theoretical background related to the course.
- Course project as an integrated means for consolidating the learning outcomes of the course. The students are required to work in teams to design and develop a multimedia application that fulfills a given set of requirements, applying the appropriate technologies. Students must document properly their deliverables and do a short final presentation of their project. They are also expected to organize a work plan to fulfill the schedule and search for additional information and browse technical documentation.

Group tutoring sessions will be organized depending on the student's needs and requests.

ASSESSMENT SYSTEM

% end-of-term-examination:	50
% of continuous assessment (assignments, laboratory, practicals...):	50

Course assessment is based on the principles of continuous evaluation:

- * Continuous evaluation: 50%.
- * Final exam: 50%.

Minimum score in the final exam (usually 4 points out of 10). Additionally, optional participation activities may be proposed.

In any case, the University regulations for continuous evaluation in bachelor studies applies as well as the best practices guideline for students.

BASIC BIBLIOGRAPHY

- Adam Freeman The Definitive Guide to HTML5, Apress, 2011

- Armando Fox & David Patterson Engineering Software as a Service: An Agile Approach Using Cloud Computing, Strawberry Canyon LLC, 2013
- Douglas Crockford JavaScript: The Good Parts, O'Reilly, 2008
- Marijn Haverbeke Eloquent JavaScript, No Starch Press, 2014

ADDITIONAL BIBLIOGRAPHY

- David Flanagan JavaScript: The Definitive Guide, O'Reilly Media, 2011
- Mark J. Collins Pro HTML5 with CSS, JavaScript, and Multimedia: Complete Website Development and Best Practices, Apress, 2017

BASIC ELECTRONIC RESOURCES

- . GStreamer open source multimedia framework: <https://gstreamer.freedesktop.org/>
- Marijn Haverbeke . Eloquent JavaScript: <http://eloquentjavascript.net/>
- Mozilla Developer Network and individual contributors . Mozilla Developer Network: <https://developer.mozilla.org/en-US/>
- W3C . HTML5. A vocabulary and associated APIs for HTML and XHTML. W3C Recommendation 6 April 2023: <https://html.spec.whatwg.org/multipage/>
- W3C . Cascading Style Sheets (CSS) Snapshot 2010. W3C Working Group Note 14 February 2023: <https://www.w3.org/TR/CSS/>
- Wim Taymans, Steve Baker, Andy Wingo, Ronald S. Bultje, Stefan Kost . GStreamer Application Development Manual: <https://gstreamer.freedesktop.org/data/doc/gstreamer/head/manual/html/index.html>