

	<h2>SUBJECT DESCRIPTION</h2>	MODELO PED.013.03
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Course	Computer Science Engineering					
Subject	Multimedia Systems					
Academic year	2023-2024	Curricular year	2nd	Study period	1st semester	
Type of subject	Compulsory	Student workload (H)	Total: 140	Contact: 60	ECTS	5
Professor(s)	José Carlos Miranda					
<input checked="" type="checkbox"/> Area/Group Coordinator <input type="checkbox"/> Head of Department	José Carlos Fonseca					

PLANNED SUBJECT DESCRIPTION

1. LEARNING OBJECTIVES

- Characterize each component of the multimedia matrix (text, graphics, bitmap images, video, animation, audio).
- Manipulate the elements of the multimedia matrix.
- Develop prototypes, using graphic design principles in the design of interfaces.
- Characterize compression techniques of image and video.
- Plan, program and coordinate an interactive multimedia project.

2. PROGRAMME

1. Digital Representation of Information and Interactivity

Types of static information. Types of dynamic information. Classification of multimedia information. Characteristics of multimedia systems. Interactive multimedia applications.

2. Graphics (vectors) and Images (bitmaps)

Basic Concepts. Advantages and Disadvantages. Technical Production. File Formats. Digital Camera. Image Manipulation.

3. Digital Video and Animation

Basic Concepts. Technical Production. Video Formats. Codecs. Digital Video Camera. Digital Video Authoring.

4. Audio Digital

Basic Concepts. Digital Audio Formats. Voice recognition and synthesis. MIDI protocol. Digitizing and Sound Editing. MP3 compression.

5. Usability.

Important features in Human-Machine Interaction (HCI); User Interface and User Experience (UI/UX); User-centric development; Useful recommendations that help to create a good interface design; Horizontal and vertical prototypes: "look and feel".

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6. Compression Techniques

Lossy and lossless Compression Techniques. JPEG Image Compression. MPEG Video Compression. Video standards.

7. Multimedia Project

Analysis and Planning. Design. Multimedia Production. Multimedia Programming. Development of an Interactive Multimedia Project.

3. COHERENCE BETWEEN PROGRAMME AND OBJECTIVES

Contents C1 is consistent with Objective O1 because they focus on the multimedia technology, which presents concepts and technologies related to multimedia, interactivity and digitization of information.

Particular focus is given to the elements of the matrix multimedia.

Contents C2, C3 and C4 are consistent with Objective O2. Particular focus is given to the practical application of the concepts introduced in the theoretical component. We present tools to manipulate vector graphics, digital photography, audio, video and animation.

Contents C5 is consistent with objective O3. The important characteristics of Human-Machine Interaction (HCI) and the graphic design principles that allow creating a good design of interfaces (UI/UX) are discussed.

Contents C6 is consistent with Objective O4 because it made an approach to compression techniques for image and video, with particular focus on standards JPEG and MPEG.

Contents C7 is consistent with Objective O5 because it presents the fundamental principles that allow us to understand and carry out the development and coordination of a multimedia project. Particular focus is given on multimedia programming with the creation of interactive games.

4. MAIN BIBLIOGRAPHY

Mandatory

Miranda, J.C (2023). Apontamentos da disciplina. Departamento de Informática. Moodle – ESTG/IPG.

Fluckiger, F. (1995). Understanding Networked Multimedia. Prentice-Hall.

Fonseca, M. e Campos, P. e Gonçalves, D. (2012). Introdução ao Design de Interfaces. Lisboa: FCA, Editora Informática - ISBN 978-972-722-738-9.

Vasconcelos, J.B. e Ribeiro, N. (2013). Tecnologias de Programação de Jogos. Lisboa: FCA- Editora de Informática.

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Recommended

Ribeiro, N. (2004). *Multimedia e Tecnologias Interactivas*. Lisboa: FCA- Editora de Informática.

Martinho, C. e Santos, P. e Prada, R. (2013). *Design e Desenvolvimento de Jogos*. Lisboa: FCA- Editora de Informática.

Dix, A., Finlay, J., Abowd, G. and Beale, R. (2004). *Human Computer interaction (3rd Edition)*. Prentice Hall.

www.unity3d.com

5. TEACHING METHODOLOGIES (INCLUDING EVALUATION)

Teaching methodologies:

- Lecture,
- Interactive lesson,
- Problem solving,
- Project,
- Tutorials

Evaluation Rules:

- Continuous evaluation:

Practical Assignments (80%) + Theoretical Test (20%)

- Final Exam Evaluation (regular season):

Practical assignments (80%) + Theoretical Test (20%) *

* The student must complete the practical component to be admitted to the exam.

- Final Exam Evaluation (supplementary or special season)

Theoretical-Practical Test (100%)

6. COHERENCE BETWEEN TEACHING METHODOLOGIES AND OBJECTIVES

Lectures are consistent with the objectives due to the need to provide students with the theoretical contents, including the various concepts related to the elements of the multimedia matrix (O1 and O2), the usability principles (O3), the compression techniques of image and video (O4), and also the concepts related to the development of an Interactive Multimedia Project (O5).

Interactive Lessons are consistent with the objectives since student/teacher interaction helps with learning the concepts of the programme and the introduction of new ideas, perspectives and solutions. Specific tools are used for practical application of the concepts introduced in the theoretical component,

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particularly for manipulating the elements of the matrix multimedia (O2), the prototype development (O3) and for the programming of the multimedia project (O5).

Problem solving is consistent with the objectives since the application of theoretical concepts to solve real life practical exercises related to the manipulation of images, sound and video (O2), the graphical interface design (O3), as well as the development of multimedia programming (O5) helps consolidate the concepts, highlighting the student's expertise.

Project development is consistent with the objectives since it covers the development of an interactive multimedia project, through all development stages from its planning to its distribution (O5), requiring the practical application of all concepts covered throughout the semester to a realistic and new situation. The realization of this project allows students to develop their skills of coordination and teamwork.

In the **Tutorial** sessions is supervised and controlled the independent work of the student. The presentation of the work is performed by students in the classroom and allows students to see their work validated by the teacher, as well as clarify all his doubts.

7. ATTENDANCE

Tutorial works must be submitted on the date defined in the schedule of discipline, available to students in the eLearning platform. Students with "student worker" status can present their works at a date to match with the teacher.

8. CONTACTS AND OFFICE HOURS

José Carlos Miranda | jcmira@ipg.pt | gabinete 39 (ESTG)

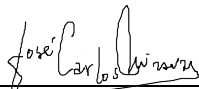
Atendimento: Tuesday (10:00-11:00) | Wednesday (10:00-11:00 | 14:00-15:00)

DATE

25 de setembro de 2023

SIGNATURES

Professor


 (signature)

Area/Group Coordinator

 (signature)