

Course Unit	Development of Multimedia Products		Field of study	Computing from the User Point of View	
Master in	Information and Communication Technologies- Education and Training		School	School of Education	
Academic Year	2023/2024	Year of study	1	Level	2-1
Type	Annual	Semester	-	ECTS credits	10.0
Code	1083-622-1001-00-23				
Workload (hours)	270	Contact hours	T -	TP 63	PL -
			TC -	S 10	E -
			OT 17	O -	

T - Lectures; TP - Lectures and problem-solving; PL - Problem-solving, project or laboratory; TC - Fieldwork; S - Seminar; E - Placement; OT - Tutorial; O - Other

Name(s) of lecturer(s) Vítor Manuel Barrigão Gonçalves

### Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:

1. Understand the educational and training challenges posed by emerging technologies and requirements of today's society;
2. Select and use autonomously, authoring multimedia tools aimed at the design of educational products;
3. Use technologies for editing image, audio and video;
4. Design educational multimedia products able to enhance cognitive development of students;
5. Make available or publish the products developed in the current information systems (Network, DVD or CD);
6. Apply the basics of pre-production, production and post-production and the methods, techniques and tools for modeling and specification of multimedia applications;
7. Develops educational projects to integrate ICT in learning contexts, based on active methods of constructivist and socio-constructivist root;
8. Understand the basic principles of multimedia production, using the latest technologies for their creation and publishing, developing a proactive approach.

### Prerequisites

Before the course unit the learner is expected to be able to:  
Use Information and Communication Technologies at user level.

### Course contents

1- Introduction to Multimedia. 2- Text and Typography. 3- Images and Graphics. 4- Animation. 5- Audio. 6- Video. 7- Interface and virtual space. 8- Multimedia Applications. 9- Multimedia Development. 10- Use of multimedia technologies.

### Course contents (extended version)

1. Introduction to Multimedia:
  - Definition and basics
  - Audio, Visual and Scripto Languages and Derived Languages
  - Media Types and digital formats
  - Basic Technologies
  - Components of the multimedia products matrix
  - Basic Technologies
  - Characteristics of multimedia products and components
  - Multimedia Applications
2. Text and Typography:
  - Font Types characteristics
  - Influence of support in readability
  - Composition and text systematization methods
  - Text Technologies
  - File types and formats
  - Hypertext, HTML language and Web pages
  - Good practices in the design of educational Web pages
3. Images and Graphics:
  - Bitmap image and vector image
  - Color Systems and conversion between color systems
  - Acquiring, scanning and recording image
  - Image Technologies
  - Image file types and formats
  - Good practices in image editing and processing and graphic design
  - Good practices in image acquisition, editing and use for different media
4. Animation:
  - Traditional animation and digital animation
  - Fundamental principles of digital composition
  - Animation techniques and technologies
  - Animation file types and formats
  - 2D animation, 3D animation and animation on the Web.
  - Authoring technologies and content animation
  - Good practices in the design of animations
5. Audio:
  - Hearing sense
  - Sound and its main features
  - Acquiring, scanning and recording audio
  - Audio technologies
  - Audio file types and formats
  - CODECS and MPEG Audio
  - Good practices in the use of sound in audiovisual and computing environments
6. Video:
  - Convert analog video to digital video
  - Acquiring, scanning and recording video
  - Video technologies
  - Video file types and formats
  - CODECS and MPEG Video
  - Phases of pre-production, production and post-production
  - Good practices in the design of audiovisual products
7. Interface and virtual space:
  - Human/machine interface
  - Interface: organization and navigation
  - Interactivity types and levels

**Course contents (extended version)**

- The components in multimedia interface
  - Virtual reality
  - Virtual environments based in graphics
  - Virtual environments based in photos: objects, panoramics and scenes
8. Multimedia Applications:
- Classification in the context of the course
  - Ferramentas de autoria
  - Other multimedia development technologies
9. Multimedia Development:
- Multimedia software development models
  - Script, Storyboard and prototypes
  - Software analysis, specification and design
  - Functionality, usability and accessibility
  - Development of multimedia products for educational contexts
10. Use of multimedia technologies:
- Editing and processing images and vector drawing
  - Images and graphics for the Internet
  - Audio and video edition
  - Design of interactive virtual spaces
  - Design of augmented reality environments
  - Design of Web pages with HTML5

**Recommended reading**

1. Costello, V. (2017). Multimedia Foundations: Core Concepts for Digital Design. Routledge. ISBN: 9780415740036
2. Silva, M. (2018). Fundamentos de HTML5 E CSS3. São Paulo, SP: Novatec. ISBN: 978-857-522-708-4.
3. Fonseca, M. ; Campos, P. & Gonçalves, D. (2012). Introdução ao Design de Interfaces. Lisboa: FCA. ISBN: 978-972-722-738-9.
4. Ball, M. (2022). Metaverso - O que é, Como Funciona e Porque Vai Revolucionar o Mundo? Loures: Alma dos Livros. ISBN: 9789895700622
5. Ribeiro, N. (2012). Multimédia e tecnologias interativas, 5ª Ed. Lisboa: FCA. ISBN: 978-972-722-744-0.

**Teaching and learning methods**

Concepts presentation to integrate new knowledge or to understand the contents sequence. Subject discussion, in person or distance, to introduce new concepts and/or deepen knowledge. Practice sessions for each of the multimedia technologies. Workgroup: multimedia projects.

**Assessment methods**

1. Continuous assesment - (Regular, Student Worker) (Final)
  - Laboratory Work - 50% (Portfolio of practical work (5 works), including participation in discussion forums)
  - Projects - 50% (Laboratory Project in group: Development of multimedia material for education)
2. Exam - (Regular, Student Worker) (Supplementary, Special)
  - Final Written Exam - 100% (Individual test of theoretical and practical contents)

**Language of instruction**

Portuguese, with additional English support for foreign students.

**Electronic validation**

Vítor Manuel Barrigão Gonçalves	Maria Raquel Vaz Patrício	Manuel Florindo Alves Meirinhos	Carlos Manuel Costa Teixeira
22-02-2024	23-02-2024	23-02-2024	25-02-2024