COURSE SYLLABUS 2021-22

BASIC INFORMATION ON THE COURSE

Course:	Multimedia Systems		
Course code:	71142105	Plan:	Master in Technologies and Applications inComputer Science
Academic Year:	2021-22	Undergraduate/Graduate:	Graduate
Degree Year:	4	Type:	Mandatory
Duration:	First semester		

TIME DISTRIBUTION ACCORDING TO REGULATIONS

Credits:	4
Total time:	100
USE OF LEARNING PLATFORM (Teaching support, Multimodal, or Virtual):	Multimodal 50% face-to-face

TEACHERS

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OTHER IMPORTANT INFORMATION

Content Justification

Human beings perceive our environment through multimedia content (print sounds and images).Therefore, in any information processing system there will be subsystems that handle multimediacontent. In the subject of Multimedia Systems (MS), which can be considered as an extension ofMultimedia Technologies of the Degree in Computer Engineering at the UAL, the main techniques thathelp to understand how these systems have been designed and why they work are studied. In addition,emphasis is placed on the most active lines of research in this field.

Courses Related in Study Plan

1. Especialidad en Desarrollo Web/Móvil.
   1. Sistemas Interactivos.
   2. Tecnologías y Recursos Web/Móvil.
2. Tecnologías Informáticas.
   1. Seguridad Informática.
3. Especialidad en Big Data.
   1. Visualización de datos.

Required Knowledge to Address the Course

1. Information theory.
2. Signal theory.

Pre-Required Knowledge

None.

COMPETENCES

Basic and General Competences

Basic competences

CB7: Application of knowledge. Students should be able to apply acquired knowledge andproblem solving skills in new or unfamiliar environments within broader (or multidisciplinary)contexts related to their area of study.

General competences

CE03: Ability to direct, plan and supervise multidisciplinary teams.

Key competences University of Almeria

CT04: Teamwork.

Specific Competences

TI10: Ability to use and develop methodologies, methods, techniques, specific use programs,norms and standards of graphic computing.

2.TI11: Ability to conceptualize, design, develop and evaluate the human-computer interaction ofproducts, systems, applications and IT services.

3.TI12: Capacity for the creation and exploitation of virtual environments, and for the creation,management and distribution of multimedia contents.

LEARNING OUTCOMES

1. That the student is able to apply the acquired knowledge and solve problems in new or little known environments within broader (or multidisciplinary) contexts related to their area of study.
2. That the student is able to use and develop methodologies, methods, techniques, specific use programs, norms and standards of graphic computing.
3. That the student is able to conceptualize, design, develop and evaluate the personal interaction of computer products, systems, applications and services.
4. That the student is able to create and exploit virtual environments, and creation, management and distribution of multimedia contents.

PLANNING

Contents

1. Framework.
    a. Linux.
    b. Git.
    c. Python / Jupyter.
2. Entropy coding.
    a. PNG.
    b. JPEG.
    c. BPG.
3. Quantization.
    a. Scalar.
    b. Vectorial.
4. Color transforms.
    a. DCT.
    b. YCrCb.
    c. YCoCg.
5. Spatial transforms.
    a. DCT.
    b. DWT.
6. Motion estimation and compensation.
    a. In the image domain.

b. In the transform domain.

7. MRVC.

Learning System and Methodology / Contingency Plan

Learning Methodology

1. Participatory master classes.
2. Preparation and writing of practical works.
3. Autonomous or group work.

MS is taught following the PBL (Project Based Learning) methodology. Students, by development groups of up to 4 people, implement a project related to the contents of the subject, by specified and timed milestones in the Study Guide. The face-to-face sessions are dedicated to:

1. Develop the agenda and resolve doubts about its contents.
2. Develop the projects.
3. Present and evaluate milestone solutions.

Learning system

1. Participatory master classes.
2. Preparation and writing of practical works.
3. Autonomous work. 25% of the teaching group sessions are dedicated to this activity.
4. Presentation of works / projects.

Contingency plan

Given high levels of health alert, the training activities planned in the Teaching Groups will be taught through videoconference. The Working Groups will continue with face-to-face teaching according to the planning established. In the face of more restrictive measures agreed by the health authorities, the Working Groups would also be held by videoconference".

Teaching Innovation Activities

MS participates in the groups of teaching innovation "Development of Resources to motivate the study of Computer Engineering" and "Integration of the CISCO NetAcad curriculum as a teaching complement". Activities related to the development of the subject project are carried out.

Functional Diversity / Functional Disability

Those students with disabilities or special educational needs can get in contact with the Delegation of the Rector for the Functional Diversity (http://www.ual.es/discapacidad) to receive the appropriate guidance and advice in order to facilitate their instructional, learning and training processes. Likewise, these students may request the implementation of the necessary and suitable adaptations of content, methodology and evaluation that guarantee equal opportunities in their academic development. The processing of any personal data or aggregated information regarding these aforementioned students, in fully compliance with the GDPR, is strictly confidential. Faculties and academic staff lecturing the course referenced by this guide/document will be in charge of applying the recommended adaptations approved by the Delegation of the Rector for the Functional Diversity. This fact will be, therefore, notified to the School or Faculty as well as to the coordinator of the academic course.

COMPETENCY ASSESSMENT

Criteria and Assessment Tools / Contingency Plan

Criteria and Assessment Tools

SM is evaluated on an ongoing basis, although there is the possibility of a single final evaluation, which would take place on the day scheduled for the exam. The continuous evaluation of the students is carried out from the work developed for each of the milestones that are periodically presented in class. The Qualification for each milestone is carried out by both the students and the teacher and is calculated from a specific rubric for the corresponding milestone that takes into account the skills that the student must acquire:

1. Application of knowledge (CB7): it is evaluated based on the degree of achievement of the milestone and the qualification that the members of the development group assign to each other.

2. Teamwork (CT04): it is evaluated based on the degree of achievement of the milestones and the qualification that the members of the development group assign to each other.

3. Ability to lead, plan and supervise multidisciplinary teams (CE03): it is evaluated based on the ratingthat the members of the development group assign to each other. It is also evaluated by the teacher based on student behavior in class.

4. Ability to use and develop methodologies, methods, techniques, specific use programs, norms and standards of graphic computing (TI10): it is evaluated, individually and in groups, based on the degree of achievement of the milestones and the skills shown during face-to-face sessions.

5. Capacity to conceptualize, design, develop and evaluate the human-computer interaction of computer products, systems, applications and services (TI11): it is evaluated, individually and in groups, based on the degree of achievement of the milestones.

6. Capacity for the creation and exploitation of virtual environments, and for the creation, management and distribution of multimedia content (IT12): evaluated, individually and in groups, based on the degree of achievement of the milestones.

The grade for the course will be the average grade for all milestones. In the event that the student only takes the final single assessment (accessible only to students who meet the requirements) or is assessed through the extraordinary call (accessible to all students), the grade for the subject would be the one achieved in said evaluation, which will consist of a written exam. The knowledge necessary to pass the exam will be the same as that acquired by completing the milestones.

Contingency Plan

What is indicated in the evaluation section will be maintained. In cases in which the health authorities advise and/or agree not to presence of the evaluation tests in the ordinary and/or extraordinary calls, the Indicated tests will be carried out through the virtual platform

Follow-Up Mechanisms

1. Attendance to tutorials.
2. Activity in class.

3. Activity in the Aula Virtual.

COURSE MATERIALS

Recommended Course Materials

Basic

- Khalid Sayood. Introduction to data compression. Morgan Kaufmann, 2017.
- Richard Mayer. Multimedia Learning. Cambridge University Press, 2020.
- Ralf Steinmetz and Klara Nahrstedt. Multimedia Systems. Springer Science & Business Media,2004.
- Martin Vetterli and Jelena Kovacevic. Wavelets and subband coding. Prentice-Hall, 1995.

Complementary

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Other materials

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Couse Materials Available in UAL's library

You can view the current bibliography in the Library Management System by consulting the following address: https://www.ual.es/bibliografia_recomendada71142105

WEBSITES

- https://sistemas-multimedia.github.io