UNIVERSIDAD DE CASTILLA - LA MANCHA
GUÍA DOCENTE

1. General information

Course: OBJECTIVE INFORMATION SYSTEMS
Type: ELECTIVE
Degree: 405 - DEGREE IN COMPUTER SCIENCE ENGINEERING (TA)
Center: 15 - FACULTY OF SOCIAL SCIENCES AND INFORMATION TECHNOLOGIES
Year: 4
Main language: Spanish
Use of additional languages: Additional technical documentation in english
Web site: https://campusvirtual.uclm.es

Code: 42411
ECTS credits: 6
Academic year: 2022-23
Group(s): 60
Duration: First semester
Second language: English
English Friendly: Y
Bilingual: N

Lecturer: **IVÁN GONZÁLEZ DÍAZ** - Group(s): **60**

Building/Office	Department	Phone number	Email	Office hours
2.1	TECNOLOGÍAS Y SISTEMAS DE INFORMACIÓN	926051583	ivan.gdiaz@uclm.es	Available in: https://www.uclm.es/toledo/fcsociales/grado-informatica/profesorado-y-tutorias

2. Pre-Requisites

This subject builds on (but does not depend on) the competences and knowledge acquired in the subjects:

Programming Fundamentals I
Programming Fundamentals II
Data Bases
Computer Networks I and II
Human-Computer Interaction I
Computer Structure
Operating Systems I

3. Justification in the curriculum, relation to other subjects and to the profession

The optional subject of Ubiquitous Information Systems is part of the complementary training offer in the Computer Engineering degree. It provides the skills and knowledge necessary to build and manage information systems capable of governing context-sensitive intelligent environments, thus, each of the levels and components that make up a ubiquitous information system are studied, from the sensorisation and data acquisition layer of the environment, through the embedded systems that control sensors, actuators and communication transceivers, the management of energy saving modes in these systems, as well as the deployment of decentralised Ad-hoc communication networks, LPWANs with star topology and the M2M communication protocols needed to favour the exploitation of cloud and fog computing paradigms. It teaches how to build and deploy a distributed web services architecture, using the MVC pattern and the full-stack development philosophy. Finally, practical examples are provided related to the Internet of Everything (IoT + People + Processes), smart cities, ubiquitous IS applied to transport or the use of wearables/vestibles to improve quality of life.

4. Degree competences achieved in this course

Course competences

Code	Description
BA05	Knowledge about the structure, organization, functioning, and inter connexions of digital programmes, with their application in engineering problems.
CB03	Be able to gather and process relevant information (usually within their subject area) to give opinions, including reflections on relevant social, scientific or ethical issues.
CB04	Transmit information, ideas, problems and solutions for both specialist and non-specialist audiences.
CB05	Have developed the necessary learning abilities to carry on studying autonomously
CM05	Ability to acquire, formalise, and represent human knowledge in a computable form for the solution of problems throughout a digital system in any application context, especially the one linked to computational aspects, perception, and behaviour in intelligent frames.
CO13	Knowledge and application of the required tools for the storage, process, and access to informational systems, even web based ones.
INS02	Organising and planning skills.
INS04	Problem solving skills by the application of engineering techniques.
PER02	Ability to work in an international context.
TI06	Ability to foster systems, applications, and services based on network technologies, including the internet, web, electronic commerce, mulimedia, interactive sercices, and mobile computation.
UCLM02	Ability to use Information and Communication Technologies.

5. Objectives or Learning Outcomes

Course learning outcomes

Description
Acquisition of knowledge about Internet of Things development tools, languages, and platforms.
Ability to conceive, design and characterise Internet of Things projects.
Knowledge of how integrated information exchange increases organisational efficiencies across business systems.

Knnowledge and understanding of the paradigm of Ubiquitous Computing, Ambient Intelligence and Context Sensitive Environments.

Ability to use tools and develop applications and services that process information and provide intelligence to the environment of organisations.

Use of the theoretical and practical knowledge acquired to implement Ubiquitous Context Sensitive Information Systems.

6. Units / Contents

Unit 1: Introduction to Ubiquitous Information Systems (IS). Contexts of application

Unit 2: Development of full-stack web platforms in Ubiquitous IS

Unit 3: Embedded Software Development in Ubiquitous IS

Unit 4: Sensor networks and M2M communication

Unit 5: Advanced aspects in the development of Ubiquitous IS. Power management and sleep modes, quality of service management

7. Activities, Units/Modules and Methodology

Training Activity	Methodology	Related Competences (only degrees before RD 822/2021)	ECTS	Hours	As	Com	Description
Class Attendance (theory) [ON-SITE]	Lectures	BA05 TI06 UCLM02	0.72	18	N	-	Teaching of the subject matter by lecturer (MAG)
Individual tutoring sessions [ON-SITE]		BA05 CB04 INS04 TI06 UCLM02	0.18	4.5	N	-	Individual or small group tutoring in lecturer's office, classroom or laboratory (TUT)
Study and Exam Preparation [OFF-SITE]	Self-study	BA05 CB03 CB05 CM05 INS02 INS04 UCLM02	2.1	52.5	N	-	Self-study (EST)
Other off-site activity [OFF-SITE]	Practical or hands-on activities	BA05 CB03 CB05 INS02 INS04 TI06 UCLM02	0.6	15	N	-	Lab practical preparation (PLAB)
Problem solving and/or case studies [ON-SITE]	Problem solving and exercises	BA05 CB03 CB04 CB05 CM05 CO13 INS04 PER02 UCLM02	0.6	15	Y	N	Worked example problems and cases resolution by the lecturer and the students (PRO)
Writing of reports or projects [OFF-SITE]	Self-study	BA05 CB03 CB04 CB05 CM05 CO13 INS02 INS04 PER02 TI06 UCLM02	0.9	22.5	Y	N	Preparation of essays on topics proposed by lecturer (RES)
Laboratory practice or sessions [ON-SITE]	Practical or hands-on activities	BA05 CB03 CB04 CB05 CO13 INS02 INS04 PER02 TI06 UCLM02	0.6	15	Y	Y	Realization of practicals in laboratory /computing room (LAB)
Other on-site activities [ON-SITE]	Assessment tests	BA05 CB03 CB05 CM05 INS02 INS04	0.3	7.5	Y	Y	Final test of the complete syllabus of the subject (EVA)
		Total:	**6**	**150**			
		Total credits of in-class work: 2.4				**Total class time hours: 60**	
		Total credits of out of class work: 3.6				**Total hours of out of class work: 90**	

As: Assessable training activity

Com: Training activity of compulsory overcoming (It will be essential to overcome both continuous and non-continuous assessment).

8. Evaluation criteria and Grading System

Evaluation System	Continuous assessment	Non-continuous evaluation*	Description
Theoretical papers assessment	15.00%	15.00%	Non-compulsory activity that can be retaken. To be carried out before end of teaching period
Final test	45.00%	45.00%	Compulsory activity that can be retaken (rescheduling) to be carried out within the planned exam dates of the final exam call (convocatoria ordinaria).
Laboratory sessions	30.00%	30.00%	Compulsory activity that can be retaken. To be carried out during lab sessions
Oral presentations assessment	10.00%	0.00%	Non-compulsory activity that cannot be retaken. To be carried out during the theory/lab sessions for students in the continuous assessment modality
Total:	**100.00%**	**90.00%**	

According to art. 4 of the UCLM Student Evaluation Regulations, it must be provided to students who cannot regularly attend face-to-face training activities the passing of the subject, having the right (art. 12.2) to be globally graded, in 2 annual calls per subject , an ordinary and an extraordinary one (evaluating 100% of the competences).

Evaluation criteria for the final exam:

Continuous assessment:

In compulsory activities, a minimum mark of 40% is required in order to pass that activity and have the possibility to therefore pass the entire subject. The evaluation of the activities will be global and therefore must be quantified by means of a single mark. If the activity consists of several sections, each section may be evaluated separately provided students are informed in writing of this evaluation criterion at the beginning of the academic year. In the case of the activities that may be retaken (i.e., rescheduling), an alternative activity or test will be offered in the resit/retake exam call (convocatoria extraordinaria).

The final exam will be common for all the theory/laboratory groups of the subject and will be evaluated by the lecturers of the subject in a serial way, i.e., each part of the final exam will be evaluated by the same lecturer for all the students. A student is considered to pass the subject if she/he obtains a minimum of 50 points out of 100, taking into account the points obtained in all the evaluable activities, and also has passed all the compulsory activities.

For students who do not pass the subject in the final exam call (convocatoria ordinaria), the marks of activities already passed will be conserved for the resit/retake exam call (convocatoria extraordinaria). If an activity is not recoverable, its assessment will be preserved for the resit/retake exam call

(convocatoria extraordinaria) even if it has not been passed. In the case of the passed recoverable activities, the student will have the opportunity to receive an alternative evaluation of those activities in the resit/retake exam call and, in that case, the final grade of the activity will correspond to the latter grade obtained.

The mark of the passed activities in any call, except for the final exam, will be conserved for the subsequent academic year at the request of the student, provided that mark is equal or greater than 50% and that the activities and evaluation criteria of the subject remain unchanged prior to the beginning of that academic year.

The failure of a student to attend the final exam will automatically result in her/him receiving a "Failure to attend¿ (no presentado). If the student has not passed any compulsory evaluation activity, the maximum final grade will be 40%.

Non-continuous evaluation:

Students who are unable to attend training activities on a regular basis may apply at the beginning of the semester for the non-continuous assessment mode. Similarly, if a student who is undergoing continuous assessment incurs any circumstance that prevents her/him from regularly attending the classroom-based training activities, she/he may renounce the accumulated mark in continuous assessment and apply for the non-continuous assessment mode.

In the same way, the student may change to the non-continuous evaluation mode as long as she/he has not participated during the teaching period in evaluable activities that together account for at least 50% of the total mark of the subject. If a student has reached this 50% of the total obtainable mark or the teaching period is over, she/he will be considered in continuous assessment without the possibility of changing to non-continuous evaluation mode.

Students who take the non-continuous evaluation mode will be globally graded, in 2 annual calls per subject , an ordinary and an extraordinary one (evaluating 100% of the competences), through the assessment systems indicated in the column "Non-continuous evaluation".

In the "non-continuous evaluation" mode, it is not compulsory to keep the mark obtained by the student in the activities or tests (progress test or partial test) taken in the continuous assessment mode.

Specifications for the resit/retake exam:

Evaluation tests will be conducted for all recoverable activities.

Specifications for the second resit / retake exam:

Same characteristics as the resit/retake exam call.

9. Assignments, course calendar and important dates

Not related to the syllabus/contents

Hours	hours
Class Attendance (theory) [PRESENCIAL][Lectures]	18
Individual tutoring sessions [PRESENCIAL][]	4.5
Study and Exam Preparation [AUTÓNOMA][Self-study]	52.5
Other off-site activity [AUTÓNOMA][Practical or hands-on activities]	15
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	15
Writing of reports or projects [AUTÓNOMA][Self-study]	22.5
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	15
Other on-site activities [PRESENCIAL][Assessment tests]	7.5

Global activity

Activities	hours
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	15
Other on-site activities [PRESENCIAL][Assessment tests]	7.5
Other off-site activity [AUTÓNOMA][Practical or hands-on activities]	15
Writing of reports or projects [AUTÓNOMA][Self-study]	22.5
Individual tutoring sessions [PRESENCIAL][]	4.5
Study and Exam Preparation [AUTÓNOMA][Self-study]	52.5
Class Attendance (theory) [PRESENCIAL][Lectures]	18
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	15
Total horas:	150

10. Bibliography and Sources

Author(s)	Title/Link	Publishing house	City	ISBN	Year	Description
Fontecha, J., Serrano, M.A., González, I., Hervás, R.	MERN. Guía Práctica de Aplicaciones Web	Ra-Ma		9788418551055	2021	
Vedat Ozan Oner	Developing IoT Projects with ESP32: Automate your home or business with inexpensive Wi-Fi devices	Packt		978-1838641160	2021	