Universida_{de}Vigo

Subject Guide 2023 / 2024

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	D9 Have t and me	the ability to manage time and resources: develop plans eet them.	s, prioritize activ	ities, identify critio	cal ones, set deadlines

Expected results from this subject	
Expected results from this subject	Training and Learning Results
RA1: Know the characteristics and functions of a real-time systems.	A1
	A2
	A4
	B1
	C20
	D3
DAD. Ability to design and meaning a real time system	
RA2: Ability to design and program a real-time system.	A1 A2
	AZ A A
	R1
	B5
	C20
	D3
	D7
	D8
RA3: Know the most common programming languages for real-time systems, both synchronous and	A1
asynchronous.	A2
,	A4
	A5
	B1
	B5
	C20
	C21
	D3
	D7
	D8
DA4. Know the analystical of a lights active as a second as with an aid other time to fault to be and	<u>D9</u>
RA4: Know the production of reliable software components, with special attention to fault tolerance and	A1 A2
end recovery.	AZ A/
	Δ5
	R1
	B5
	C20
	C21
	C22
	D3
	D7
	D8
	D9
RA5: Know the basics of concurrent programming, communication and synchronization in real-time	A2
systems.	A5
	B2
	C21 C22
	C22
	C30 D7
	D9
RA6: Know the temporal requirements of the functionalities of the language and the strategies to satisfy	A1
them, both in the synchronous and asynchronous case.	A2
	A4
	A5
	B1
	B5
	C20
	C22
	U3 D7
	D1
	ΔQ DQ
	אח

RA7: Know the architectures of integration of artificial intelligence in real-time systems, with a view to an A efficient treatment of planning. B B C C C C C C C C C C C C C C C C C	44 45 31 219 221 230 23 230
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Contents		
Торіс		
Real-time systems.	Introduction.	
	RTS design.	
	Intelligent Systems in RT.	
Determinism and reliability.	Determinism.	
	Reliability.	
	Fault tolerance.	
	Exception handling.	
Parallelism.	Concurrence.	
	Synchronous and asynchronous hypothesis.	
	Real time.	
	Planning.	
	Distribution.	
Planning.	Strategies.	
	Verification of behavior.	
	Architectures.	
Implementation languages.	General purpose languages.	
	Agent-based languages.	
	Simulation.	
Planning		-

Planning			
	Class hours	Hours outside the classroom	Total hours
Lecturing	12	12	24
Laboratory practical	8	24	32
Case studies	1	2	3
Project based learning	0	16	16
*The information in the planning table	is for guidance only and does no	ot take into account the het	erogeneity of the students.

Methodologies	
	Description
Lecturing	Presentation by the teacher of the main contents of the subject.
	CONTINUOUS ASSESSMENT
	Mandatory character
	Attendance: Mandatory
	OVERALL ASSESSMENT
	Mandatory character
Laboratory practical	Presentation and supervision by the teacher of practical problems that complement the theoretical contents seen in the master classes and in the presentations.
	CONTINUOUS ASSESSMENT
	Mandatory character
	Attendance: Mandatory
	OVERALL ASSESSMENT
	Mandatory character
Case studies	Teacher will present to Students a work scenario, real or fictitious, that exposes a certain problem. Students must solve it and present the solution through a video of about 10' in length; the solution will be elaborated by applying the knowledge acquired along the course.
	CONTINUOUS ASSESSMENT
	Mandatory character
	Attendance: Mandatory
	OVERALL ASSESSMENT
	Mandatory character

Project based learning The teacher will propose to the students a series of practical projects for their resolution using the contents seen both in theory and in the laboratory. The solution will be composed of an annotated code and a memory that adequately describes the solution provided.

CONTINUOUS ASSESSMENT Mandatory character Attendance: Mandatory OVERALL ASSESSMENT Mandatory character

Personalized assistance								
Methodologies		Description						
Case studies		Teacher will advise the student on how to organize the contents chosen for exposure to the rest of the students. Teacher will use as support the telematic means available.						
Project based learning		Teacher will advise the student on how to approach the design and organization of the solution proposed by the student to the assigned project. Teacher will use as support the telematic means available.						
According								
Assessment	Descript	ion	Qualificati	on	Trair	ning a	nd	
	Descript		Quanneaci	L	earni	ng Res	sults	
Lecturing	At the er used for the eval	nd of each topic, problems/exercises will be proposed that will be an evaluation through continuous monitoring of the subject. It allows uation of RA1, RA3, RA4, RA5 and RA6	30	A1	B1	C19 C20 C21 C22		
	To releas their fina	se this assessment test, the student must get 5 points or more in al grade.				C30		
	In the ca students	use of opting for the global evaluation, on the date of the exam the swill be able to answer the exercises that are presented.						
Case studies	Presenta allows th	ation of a video with its own solution to a proposed case study. It ne evaluation of RA1, RA3, RA4, RA5, RA6 and RA7	30	A4 A5	B1	C19 C20 C21	D8 D9	
	This met evaluatio	hodological test is compulsory, both in continuous and global on.				C22 C30		
	To releas	se this part of the evaluation, the student must get 5 points or more grade.						
	Late deli order wi	iveries and those that are delivered in a different format than the ll be rated 0.						
Project based learning	The solu and assi RA7	tion (code + explanatory memory) to a practical project proposed gned will be evaluated. It allows the evaluation of RA2, RA4, RA6, and	40 I	A1 A2 A4	B2 B5	C19 C20 C21	D3 D7 D8	
	This test groups c	will be evaluated with the applications provided to be carried out in of 2 people.		AJ		C30	69	
	This met evaluatio	hodological test is compulsory, both in continuous and global on.						
	The deliv deliverie rated wit	very must be made on the dates and in the manner indicated. Late is and those that are delivered in a different format than asked will be th 0.	2					
	The deliv date and	very could require a defense by the members of the group on the I in the manner indicated.						
	To releas their fina	se this assessment test, the student must get 5 points or more in al grade						

Other comments on the Evaluation

CONTINUOUS ASSESSMENT SYSTEM

TEST 1: Resolution of problems and/or exercises

<u>Description</u>: Resolution of exercises and/or problems proposed at the end of each topic to evaluate the comprehension of the unit and carry out continuous monitoring of the subject. These exercises will be carried out and delivered offline.

<u>Methodology(s) applied(s)</u>: Lecturing.

Qualification: 30%

<u>Minimum</u>: For the release of this part of the subject, the student must obtain a grade equal to or greater than 5 points (out of 10) in the final grade of the test, which will be calculated cumulatively by adding the points achieved in each installment.

TEST 2: Elaboration of Memory and Video

<u>Description</u>: Preparation of a video and a brief report that presents/defends the student's solution to the assigned case study. The work will be developed in pairs and delivered offline on the date to be determined.

<u>Methodology(s) applied</u>: Case studies

Qualification: 30%

<u>Minimum</u>: For the release of this part of the subject, the student must obtain a score equal to or greater than 5 points (out of 10) in the evaluation of both the memory and the video. Late deliveries and those that do not meet the parameters set for delivery will be scored with 0 points.

TEST 3: Development of a practice and a practice report

<u>Description</u>: After the second week, a "Project" will be proposed to be developed and solved in pairs. The solution will evolve over the weeks with the support of laboratory classes in which doubts will be solved and the feasibility of the proposed solution will be continuously verified.

Methodology(s) applied: Project Based Learning

Qualification: 40%

<u>Minimum</u>: For the release of this part of the subject, the student must obtain a grade equal to or greater than 5 points (out of 10) in the evaluation, both in the code and in the report. Once the delivery has been made, a defense of the work carried out may be required in order to verify its authorship.

- The final grade for the subject is calculated using the weighted average of the previous tests. In order to take said average, the student must achieve at least a 4 in each of the tests.
- If, at the end of the course, a student presents a grade of less than 4, in two or more of the previous tests, his/her grade will be determined by the minimum value between the average of the grades and 4.
- All the deliveries of the previous tests that are not carried out on time and in the requested form will be graded with a 0.

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GLOBAL EVALUATION SYSTEM

Procedure for choosing the global assessment modality: Since the default assessment system is CONTINUOUS ASSESSMENT, it is considered that all enrolled students opt for said system. In case of wanting to be evaluated through the GLOBAL EVALUATION system, "Once the period of one month from the beginning of the semester has passed, a period of 5 working days will be enabled for the students enrolled in the subject to formally state their intention to benefit from the GLOBAL EVALUATION system.]

TEST 1: Theory Exam

<u>Description</u>: Objective test that will include the evaluation of the theoretical concepts seen throughout the course and resolution of exercises/problems proposed in the Continuous Assessment System.

Applied Methodology(s): Lecture

Qualification: 50%

<u>Minimum</u>: For the release of this part of the subject, the student must obtain a grade equal to or greater than 5 points (out of 10).

TEST 2: Elaboration of Memory and Video

<u>Description</u>: Preparation of a video and a brief memory that presents/defends the student's solution to a determined case study. The work will be delivered on the date determined prior to the final exam.

<u>Methodology(s) applied</u>: Case study

Qualification: 10%

<u>Minimum</u>: For the release of this part of the subject, the student must obtain a score equal to or greater than 5 points (out of 10) in the evaluation of both the memory and the video. A late delivery or one that does not conform to the parameters set for the delivery will be qualified with 0 points.

TEST 2: Development of a practice and a practice report

<u>Description</u>: Delivery of a solution to a "Project" that will be proposed for students who use this system and that must be delivered on the date (prior to the exam date) and in a manner determined. The solution will consist of a code with the solution and a report that explains and defends the proposed solution.

Methodology(s) applied: Project Based Learning

Qualification: 40%

<u>Minimum</u>: For the release of this part of the subject, the student must obtain a grade equal to or greater than 5 points (out of 10) in the evaluation, both in the code and in the report. Once the delivery has been made, the defense of the work carried out may be required in order to verify its authorship on the examination date by answering several questions related to the assigned "Project".

- The final grade for the subject is calculated using the weighted average of the previous tests. In order to take said average, the student must achieve at least a 4 in each of the tests.
- If, at the end of the course, a student presents a grade of less than 4, in one or more of the previous tests, their grade will be determined by the minimum value between the average of the grades of said tests and four.
- All the deliveries of the previous tests that are not carried out on time and in the requested form will be graded with a 0.

EVALUATION CRITERIA FOR EXTRAORDINARY CALL AND FINAL DEGREE

The continuous and global evaluation systems described above will be used.

RECORD QUALIFICATION PROCESS

Regardless of the evaluation system and the call, if any part of the evaluation is not passed, but the overall score is greater than 4 (out of 10), the qualification in the minutes will be 4.

EVALUATION DATES

The dates of the tests corresponding to the continuous assessment system will be published in the calendar of activities, available on the ESEI website https://esei.uvigo.es/docencia/horarios/.

The official exam dates of the different calls, officially approved by the Xunta de Centro of the ESEI, are published on the ESEI website https://esei.uvigo.es/docencia/horarios/.

USE OF MOBILE DEVICES

All students are reminded of the prohibition of the use of mobile devices in exercises and practices, in compliance with article 13.2.d) of the University Student Statute, regarding the duties of university students, which establishes the duty to

"Refrain from using or cooperation in fraudulent procedures in the evaluation tests, in the works that are carried out or in official documents of the university."

CONSULTATION/REQUEST FOR TUTORIALS

The tutorials can be consulted through the personal page of the teaching staff, accessible through https://esei.uvigo.es/docencia/profesorado/

Sources of information Basic Bibliography

Complementary Bibliography

Alan Burns, Andy Wellings, **Sistemas de tiempo real y lenguajes de programación**, 9788478290581, 3ª, Addison-Wesley, 2003

Manuel I. Capel Tuñón, **Programación Concurrente y en tiempo real: Fundamentos y aplicaciones**, 9788417289362, Garceta, 2022

Rafael H. Bordini, Jomi Fred Hübner, Michael Wooldridge, **Programming Multi-agent systems in Agent-Speak with** Jason, 10.1002/9780470061848, Wiley, 2007

Olivier Boissier, Rafael H. Bordini, Jomi Hubner, Alessandro Ricci, Multi-Agent Oriented Programming: Programming Multi-Agent Systems Using JaCaMo, 9780262044578, MIT Press, 2020

Recommendations

Subjects that it is recommended to have taken before

Multiagent systems/006M193V01202