TEACHING GUIDE

PROGRAMMING IN NETWORK ENVIRONMENTS

GRADO EN INGENIERÍA BIOMÉDICA (INGLÉS)

ACADEMIC YEAR 2020-21

Date: 28-07-2020

I.-Subject Identification	
Type	OBLIGATORIA
Teaching period	1 course, 2Q semester
Nº of credits	6
Language in wich the subject is taught	English

IMPORTANT NOTE ABOUT THE LEARNING MODEL DURING THE 2020-2021 ACADEMIC YEAR
The Protocol for adapting teaching at the Universidad Rey Juan Carlos to the health crisis caused by COVID-19, approved by the Council, establishes the framework in which academic activities during the 2020-2021 academic year should be carried out, in transition while these exceptional circumstances are ongoing. For this reason, any teaching and learning activities conducted will consider the class as the area of interaction between teaching staff and students which occurs in both physical and virtual environments, and which facilitate a model of continuous work and constant interaction between the subject teacher and the students of a group both through synchronous and asynchronous activities. In order to be able to respond in the most efficient manner to the situational changes that the health conditions? development may require, whether that be to return to a completely on-site model or to fulfil the need to carry out all activity online in the case of a worsening of the situation, this Teaching Guide for your subject details how the University?s contingency plan will be applied if this were necessary. To this effect, in the Methodology and Academic Programme, and Assessment Methods sections, there is specific information about how these parts of the curriculum will be adapted, if necessary.

II.-Presentation
The subject will train the student in the different techniques of programming of computerized systems in network, in the field of Biomedicine. Main goals: to understand the computers networks and how to create software applications over them in order to find solutions to the current challenges that biomedicine has in the present.The course will be **very practical** with all the sessions in the laboratories and most of them with programming exercises. The only way of learning how to program is... programming

III.-Competences
Generic competences
Specific competences
CE11. Identify, use and adapt telecommunication technologies that offer reasonable solutions to biomedical engineering problems CE19. Use the fundamentals of programming for the development of computer programs in modern programming languages, as well as to understand and use different operating systems, databases and hospital information systems. To apply them in networks, systems and telematic services for hospital management.

IV.-Contents

IV.A.-Syllabus

The following **concepts** will be introduced and discussed:

1. Service Models.
2. Programming Techniques for Client-Server and P2P Applications.
3. Distributed Application Programming Techniques.
4. Techniques of Programming of Communications Protocols.
5. Network Security.
6. Object Oriented Programming.
7. UML.
8. Programming Web Applications.
9. Cloud Computing

They are **organized** in the following **training blocks**:

•**Presentation**
•**Block 0**: Tools. Python 3, IDE (ex. PyCharm), Control version systems (Ej. Github/Gitlab)
•**Block 1**: Introduction to object-oriented programing
•**Block 2**: Network Service Models
•**Block 3**: Communication Protocols Programming (TCP/HTTP)
•**Block 4**: Web Applications Programming
•**Final Project**

IV.B.-Training activities	
Type	**Title**
Laboratories	Practices for block 0. Synchronous online (by chat or Videoconference)
Laboratories	Practices for block 1. Synchronous online (by chat or Videoconference)
Laboratories	Practices for block 2. Synchronous online (by chat or Videoconference)
Laboratories	Practices for block 3. Synchronous online (by chat or Videoconference)
Laboratories	Practices for block 4. Synchronous online (by chat or Videoconference)
Others	Online Master classes for blocks 1-5 (videoconference)

V.-Student worload	
Lecture classes	18
Pratical classes/problem-solving, case studies, etc.	2
Practical sessions in technological laboratories, hospitals, etc.	24
Tests	16
Academic tutorials	16
Related activities: conferences, seminars, etc.	2
Preparation of lecture classes	8
Preparation of practical classes, problem-solving, case studies,etc.	80
Test preparation	14
Total student workload	180

VI.-Methodology and academic programme

[OS] On-site learning activity ? [DL] Distance learning activity ? [CP] Activity adapted according to the Contingency Plan

Type	Period	Content
Academic Tutorials	Week 1 to Week 14	[DL] The student can request a personal online meeting with the tearcher if any help is needed
Theory classes	Week 1 to Week 10	[DL] Online Master classes (Videoconference)
Laboratories	Week 1 to Week 10	[DL] Synchronous online sessions (by chat and/or Videoconference). It is not necessary to use special equipment. All the software used is open-source and multiplatform, therefore the students can install it and use it in their own computers
Laboratories	Week 10 to Week 14	[DL] Final project, with Synchronous online session

VII.-Assessment methods

VII.A.-Assessment weighting

Ordinary assessment: If the teacher considers that attendance is compulsory, they must specifically state so. (Note: in order to not allow a student to take a test due to their non-compliance with the minimum attendance, the teacher must be able to justify this decision using a provable system, like a sign-in sheet for on-site activities or the attendance control system available in Aula Virtual, both for on-site activities and synchronous activities).

The distribution and characteristics of the assessment tests are those described below. For tests where this may be necessary, there is information about how they will be adapted to respond to the change in circumstances established in the University?s contingency plan.Only in exceptional case and for special reasons may the teacher add changes to the Guide. These changes will require the prior consultation with the Subject Head and the prior and explicit authorisation of the Degree Programme Coordinator, who will notify the Vice-Rector?s office in charge of Academic Affairs of the modifications made. In any case, the changes proposed must take into account the stipulations of the verified report. In order for these changes to take effect, they must be duly communicated at the start of the course to the students using Aula Virtual.

The combination of activities that are not re-assessable cannot exceed 50% of the subject grade and, in general, cannot have a minimum grade (except for the case of laboratory or clinical work placements, where duly justified), and tests which exceed 60% of the subject weighting cannot be added.

Extraordinary assessment: Students who do not manage to pass the ordinary assessment, or who did not attend, will be subject to completion of an extraordinary assessment to verify their acquisition of the skills established in the guide, only for activities that are re-assessable.

Description of the tests for assessment and their weights.

Evaluation of the **theoretical concepts** (40%)
•Test I (20%) (in the middle of the term). In person (not online)
•Test II (20%) (in the end of the term). In person (not online)
Evaluation of the **practical work** (60%)
•Practices (20%). They are done during the term (online)
•Final project (40%). It is done in the last four weeks of the term (online)
Final score: 0.4 * Theoretical + 0.6 * Practical
The subject is passed when the final score is greater or equal to 5. If the score gotten in any of the parts (practical and theoretical) is greather than 5, it is kept for the extraordinary assessment

VII.B. Assessment of students with an academic exemption

Student who wish to opt for this assessment will have to get an academic exemption for the subject, which they will have to request from the Dean or Director of the Centre which teaches their course. An academic exemption may be granted where the subjects own characteristics allow for it.During the 2020-2021 academic year, students that medically justify their inability to attend activities that require in-person attendance as a result of COVID-19 will be able to request an academic exemption

Subject with the possibility of an exemption: Yes

VII.C. Review of assessment tests

In accordance with the exam appeal regulations of the Universidad Rey Juan Carlos.

VII.D.-Students with a disability or special educational needs

Curricular adaptations for students with a disability or special educational needs will be determined by the Disabled Students Support Department, in accordance with the regulations governing the Disabled Students Support service, approved by the Universidad Rey Juan Carlos Council, in order to guarantee equal opportunities, inclusive treatment, universal accessibility and a greater guarantee of academic success.

For this purpose, this Department will have to issue a curricular adaptation report, therefore students with disabilities or special educational needs must contact the Department to analyse the different alternatives together.

VII.E.-Academic behaviour, academic integrity and honesty

The Universidad Rey Juan Carlos is completely committed to the highest standards of academic integrity and honesty. Therefore, studying at the URJC means you accept and agree to the academic integrity and honesty values described in the University's Code of Ethics. In order to monitor this procedure, the University has Regulations on academic behaviour at the Universidad Rey Juan Carlos and uses different tools (anti-plagiarism, supervision?) which provides a collective assurance that these essential values are completely developed

VII.-Bibliography

Referecence Generic

Mark Lutz
Programming Python, 4th Edition
O'Reilly Media,2010

Mitchell L Model.
Bioinformatics programming using python.
O'Reilly 2009

Reference literature

Jason M. Kinser
Python for Bioinformatics
Jones and Bartlett, 2008

IX.-Lecturers/Teachers/Professors

Lecturer/teacher/professor´s name	DAVID ROLDAN ALVAREZ
E-mail address	david.roldan@urjc.es
Department/field	Teoría de la Señal y las Comunicaciones y Sistemas Telemáticos y Computación
Category	Profesor/a Ayudante Doctor/a
Academic qualifications	Doctor
Subject Coordinator	No
Academic tutorial timetable	Para consultar las tutorias póngase en contacto con el/la profesor/-a a través de correo electrónico
Nº of Quinquenios	0
Nº of Sexenio	0
Nº period for technology transfer	0
Stretch Docentia	0