



POLITÉCNICA

INTERNATIONAL
CAMPUS OF
EXCELLENCE

COORDINATION PROCESS OF
LEARNING ACTIVITIES
PR/CL/001



E.T.S. de Ingenieros
Informaticos

ANX-PR/CL/001-01

LEARNING GUIDE

SUBJECT

103000938 - Blockchain And Services For Fintech Enterprise Integration

DEGREE PROGRAMME

10AZ - Master Universitario En Innovación Digital

ACADEMIC YEAR & SEMESTER

2021/22 - Semester 1

Index

Learning guide

1. Description.....	1
2. Faculty.....	1
3. Prior knowledge recommended to take the subject.....	2
4. Skills and learning outcomes	2
5. Brief description of the subject and syllabus.....	3
6. Schedule.....	4
7. Activities and assessment criteria.....	6
8. Teaching resources.....	9
9. Other information.....	10

1. Description

1.1. Subject details

Name of the subject	103000938 - Blockchain And Services For Fintech Enterprise Integration
No of credits	5 ECTS
Type	Optional
Academic year of the programme	First year
Semester of tuition	Semester 1
Tuition period	September-January
Tuition languages	English
Degree programme	10AZ - Master Universitario en Innovación Digital
Centre	10 - Escuela Tecnica Superior De Ingenieros Informaticos
Academic year	2021-22

2. Faculty

2.1. Faculty members with subject teaching role

Name and surname	Office/Room	Email	Tutoring hours *
Antonio Jesus Diaz Honrubia (Subject coordinator)	D-4302	antoniojesus.diaz@upm.es	Tu - 12:00 - 14:00 W - 10:00 - 12:00 Th - 12:00 - 14:00 Please, contact by e-mail before.
Miguel Jimenez Gañan	D-4311	m.jimenez@upm.es	W - 10:00 - 13:00 F - 10:00 - 13:00 Please, contact by e-mail before.

* The tutoring schedule is indicative and subject to possible changes. Please check tutoring times with the faculty

member in charge.

3. Prior knowledge recommended to take the subject

3.1. Recommended (passed) subjects

The subject - recommended (passed), are not defined.

3.2. Other recommended learning outcomes

- Basics on Java programming language

4. Skills and learning outcomes *

4.1. Skills to be learned

CE-FT01 - Capacidad para seleccionar las soluciones de almacenamiento, manipulación, análisis y visualización para datos estructurados y no estructurados financieros de fuentes heterogéneas adecuadas en función del problema a resolver y realizar una correcta comunicación del análisis

CE-FT04 - Capacidad para diseñar proyectos robustos relacionados con las finanzas y la tecnología aplicando las últimas tecnologías software y de inteligencia artificial

CE-FT07 - Capacidad para explorar formas de utilizar nuevas herramientas y técnicas asociadas a las tecnologías financieras con una mentalidad empresarial para enfrentar los desafíos empresariales y organizativos con una mentalidad empresarial

4.2. Learning outcomes

RA25 - Understand the APIs for interoperability between IT and Assistive Products

RA119 - Being able to implement a digital non-repudiation system

RA26 - Evaluate and implement systems that use accessibility APIs

RA120 - Being able to deploy a secure service-oriented architecture for enterprise integration

RA121 - To know the basic concepts behind the blockchain technology

* The Learning Guides should reflect the Skills and Learning Outcomes in the same way as indicated in the Degree Verification Memory. For this reason, they have not been translated into English and appear in Spanish.

5. Brief description of the subject and syllabus

5.1. Brief description of the subject

This course pretends to introduce the student the data security and blockchain concepts, along with a practical viewpoint using a state-of-the-art blockchain system. The blockchain technology will be presented from a service-oriented architecture viewpoint, which can be easily used for enterprise integration.

5.2. Syllabus

1. Introduction
2. Data security foundations
3. Service-oriented architectures for enterprise integration
4. Blockchain concepts
5. Blockchain practical application
6. Seminars

6. Schedule

6.1. Subject schedule*

Week	Face-to-face classroom activities	Face-to-face laboratory activities	Distant / On-line	Assessment activities
1	Introduction Duration: 03:00		Introduction Duration: 03:00	
2	Data security fundations Duration: 03:00		Data security fundations Duration: 03:00	
3	Data security fundations Duration: 03:00		Data security fundations Duration: 03:00	
4	Data security fundations Duration: 03:00		Data security fundations Duration: 03:00	
5	Service-oriented architectures for enterprise integration Duration: 03:00		Service-oriented architectures for enterprise integration Duration: 03:00	
6	Service-oriented architectures for enterprise integration Duration: 03:00		Service-oriented architectures for enterprise integration Duration: 03:00	
7	Blockchain concepts Duration: 03:00		Blockchain concepts Duration: 03:00	
8	Service-oriented architectures project Duration: 03:00		Service-oriented architectures project Duration: 03:00	Service-oriented architectures project Continuous assessment and final examination Not Presential Duration: 00:00 Service-oriented architectures project presentation Continuous assessment Presential Duration: 03:00
9	Blockchain concepts Duration: 03:00		Blockchain concepts Duration: 03:00	
10	Blockchain practical application Duration: 03:00		Blockchain practical application Duration: 03:00	

11	Blockchain practical application Duration: 03:00		Blockchain practical application Duration: 03:00	
12	Blockchain project Duration: 03:00		Blockchain project Duration: 03:00	
13	Blockchain project Duration: 03:00		Blockchain project Duration: 03:00	
14	Seminars Duration: 03:00		Seminars Duration: 03:00	
15	Blockchain project Duration: 03:00		Blockchain project Duration: 03:00	Blockchain project Continuous assessment and final examination Not Presential Duration: 00:00 Blockchain project presentation Continuous assessment Presential Duration: 03:00
16				
17				Final exam Continuous assessment Presential Duration: 02:00 Final exam (Final-exam-only assessment) Final examination Presential Duration: 02:00

Depending on the programme study plan, total values will be calculated according to the ECTS credit unit as 26/27 hours of student face-to-face contact and independent study time.

* The schedule is based on an a priori planning of the subject; it might be modified during the academic year, especially considering the COVID19 evolution.

7. Activities and assessment criteria

7.1. Assessment activities

7.1.1. Continuous assessment

Week	Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
8	Service-oriented architectures project		No Presential	00:00	20%	4 / 10	CE-FT07 CE-FT04 CE-FT01
8	Service-oriented architectures project presentation		Face-to-face	03:00	10%	4 / 10	CE-FT01 CE-FT07 CE-FT04
15	Blockchain project		No Presential	00:00	40%	4 / 10	CE-FT07 CE-FT04 CE-FT01
15	Blockchain project presentation		Face-to-face	03:00	10%	4 / 10	CE-FT07 CE-FT04 CE-FT01
17	Final exam		Face-to-face	02:00	20%	4 / 10	CE-FT07 CE-FT04 CE-FT01

7.1.2. Final examination

Week	Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
8	Service-oriented architectures project		No Presential	00:00	20%	4 / 10	CE-FT07 CE-FT04 CE-FT01
15	Blockchain project		No Presential	00:00	40%	4 / 10	CE-FT07 CE-FT04 CE-FT01
17	Final exam (Final-exam-only assessment)		Face-to-face	02:00	40%	5 / 10	CE-FT07 CE-FT04 CE-FT01

7.1.3. Referred (re-sit) examination

Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
Re-sit exam		Face-to-face	02:00	100%	5 / 10	CE-FT07 CE-FT04 CE-FT01

7.2. Assessment criteria

Continuous assessment method

The continuous assessment of the course is divided into three main categories:

- Service-oriented architectures: project (20%) and presentation (10%).
- Blockchain: project (40%) and presentation (10%).
- Final exam: short exam to check the acquired knowledge (20%).

Students are required to obtain a minimum mark of 4 points (out of 10) in each activity, i.e. both projects, both presentations, and the exam. If any of these activities is graded lower than 4 points (out of 10), then the final mark of the subject will be no greater than 4.5 (out of 10). The minimum mark required to pass this course is 5 points (out of 10), as long as the above criteria are met.

Final-exam-only assessment method

The final-exam-only assessment method will only be offered as agreed upon by the Examination and Assessment Regulations of the University in force in the academic course. The procedure to apply for this method is subject to the regulation established by the Associate Dean for Academic Affairs. For further information, please refer to <http://www.fi.upm.es/?pagina=1147>

The final-exam-only assessment method and extraordinary call assessment consists of two projects and one final exam:

- Service-oriented architectures project (20%).
- Blockchain project (40%).
- Final exam (40%).

Students are required to obtain a minimum mark of 5 points (out of 10) in the exam and 4 points (out of 10) in each project. If this condition is not met, then the final mark will be no greater than 4.5 (out of 10). The minimum mark required to pass this course is 5 points (out of 10).

Extraordinary call assessment

The assessment in the extraordinary call consists only in one final exam covering both, theory and project. Students are required to obtain a minimum mark of 5 points (out of 10) in this exam, which will be the final mark of the student in the call.

Action procedures against fraudulent behavior

- All exams and lab deliverables must be done individually, unless specified otherwise by the teaching staff. If any non-conformity with this criteria is detected (copy, plagiarism, etc.), all students involved will be graded with 0 points (out of 10) in the corresponding activity, and therefore they will not reach the minimum mark to pass the course.
- To this end, all students involved in the fraud are considered accountable, and the above actions will be taken against both active and passive agents.
- The above actions do not exclude other actions covered by the normative and laws.

8. Teaching resources

8.1. Teaching resources for the subject

Name	Type	Notes
Data Security Handbook	Bibliography	ABA Book Publishing. ISBN: 9781604420470
Service-Oriented Architecture: Analysis and Design for Services and Microservices	Bibliography	Thomas Erl. Pearson. ISBN: 9780133858709
Blockchain	Bibliography	O'Reilly Media, Inc. ISBN: 9781491920497
Blockchain for Business	Bibliography	J. Arun, J. Cuomo, N. Gaur. Addison Wesley. ISBN: 9780135581353
Blockchain for Business with Hyperledger Fabric: A complete guide to enterprise Blockchain implementation using Hyperledger Fabric	Bibliography	N. Shah. BPB Publications. ISBN: 9789388511650

9. Other information

9.1. Other information about the subject

For attending this course, it is recommended that students bring a laptop.

The information contained in this learning guide might be subjected to small deviations according to the actual planning of the semester. Any deviation will be reported on Moodle with enough time.

The health situation caused by the COVID-19 pandemic forces to restrict the capacity of the classrooms and therefore it has been decided that the teaching of this semester will be of mixed presence. If the group has a large number of students, face-to-face shifts will be established within the groups, so that each week one half will attend class in the classroom (column "Face-to-face classroom activities" of the schedule), while the rest will be connected to the class remotely (column "Distant / On-line"). And each week it will be a different shift that comes to the classroom.

If sanitary conditions improve and face-to-face classes can be taught normally, all students will go to classrooms to receive the classes indicated in the column "classroom activity".

If, on the contrary, the sanitary conditions worsens, all the students would move to on-line teaching of the "Distant / On-line" column. In this situation, the planned face-to-face continuous assessment tests would be carried out online, without the need to modify this guide.