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

2024/25 - Semester 1

Index

Learning guide

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 ot 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	2024-25

2. Faculty

2.1. Faculty members with subject teaching role

Name and surname	Office/Room	Email	Tutoring hours *
Antonio Jesus Diaz Honrubia (Subject coordinator)	D4302	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.
Guillermo Antonio Vigueras Gonzalez	D4310	guillermo.vigueras@upm.es	M - 10:00 - 13:00 Th - 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

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

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

RA26 - Evaluate and implement systems that use accessibility APIs

RA121 - To know the basic concepts behind the blockchain technology

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

* 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 easly used for enterprise integration.

5.2. Syllabus

1. Introduction

2. Data security fundations

3. Service-oriented architectures for enterprise integration

4. Blockchain concepts

5. Blockchain practical application

6. Seminars

6. Schedule

6.1. Subject schedule*

Week	Type 1 activities	Type 2 activities	Distant / On-line	Assessment activities
1	**Introduction** Duration: 03:00 Lecture			
2	**Data security fundations** Duration: 03:00 Lecture			
3	**Data security fundations** Duration: 03:00 Lecture			
4	**Data security fundations** Duration: 03:00 Lecture			
5	**Service-oriented architectures for enterprise integration** Duration: 03:00 Lecture			
6	**Service-oriented architectures for enterprise integration** Duration: 03:00 Lecture			
7	**Blockchain concepts** Duration: 03:00 Lecture			
8	**Service-oriented architectures project** Duration: 03:00 Lecture			**Service-oriented architectures project** Group work Progressive assessment and Global Examination Presential Duration: 00:00 **Service-oriented architectures project presentation** Individual presentation Progressive assessment Presential Duration: 03:00
9	**Blockchain concepts** Duration: 03:00 Lecture			
10	**Blockchain practical application** Duration: 03:00 Lecture			

11	**Blockchain practical application** Duration: 03:00 Lecture			
12	**Blockchain project** Duration: 03:00 Laboratory assignments			
13	**Blockchain project** Duration: 03:00 Laboratory assignments			
14	**Seminars** Duration: 03:00 Additional activities			
15	**Blockchain project** Duration: 03:00 Laboratory assignments			**Blockchain project** Group work Progressive assessment and Global Examination Presential Duration: 00:00 **Blockchain project presentation** Individual presentation Progressive assessment Presential Duration: 03:00
16				
17	**Progressive assessment exam** Duration: 02:00 Additional activities			**Final exam** Written test Progressive assessment and Global 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.

7. Activities and assessment criteria

7.1. Assessment activities

7.1.1. Assessment

Week	Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
8	Service-oriented architectures project	Group work	Face-to-face	00:00	20%	4 / 10	CE-FT07 CE-FT01 CE-FT04
8	Service-oriented architectures project presentation	Individual presentation	Face-to-face	03:00	10%	/ 10	CE-FT01 CE-FT04 CE-FT07
15	Blockchain project	Group work	Face-to-face	00:00	40%	4 / 10	
15	Blockchain project presentation	Individual presentation	Face-to-face	03:00	10%	/ 10	CE-FT01 CE-FT04 CE-FT07
17	Final exam	Written test	Face-to-face	02:00	20%	4 / 10	CE-FT01 CE-FT04 CE-FT07

7.1.2. Global examination

Week	Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
8	Service-oriented architectures project	Group work	Face-to-face	00:00	20%	4 / 10	CE-FT07 CE-FT01 CE-FT04
15	Blockchain project	Group work	Face-to-face	00:00	40%	4 / 10	
17	Final exam	Written test	Face-to-face	02:00	20%	4 / 10	CE-FT01 CE-FT04 CE-FT07

7.1.3. Referred (re-sit) examination

Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills

Final exam	Written test	Face-to-face	02:00	20%	4 / 10	CE-FT07 CE-FT04 CE-FT01
Service-oriented architectures project	Group work	Face-to-face	00:00	20%	4 / 10	CE-FT01 CE-FT04 CE-FT07
Blockchain project	Group work	Face-to-face	00:00	40%	4 / 10	CE-FT01 CE-FT04 CE-FT07

7.2. Assessment criteria

Progressive assessment and non-recoverable assessment items

According to the new assessment regulation of the Universidad Politécnica de Madrid, the only way to follow a course is the progressive assessment method. According to article 12.1, this method allows students to pass an assessment item during the course and in the global evaluation of the ordinary and extraordinary calls, unless the assessment item has been defined as "non-recoverable". In this course there is only two non-recoverable assessment items which correspond with the score given to the presentations of both project (20%, 10% each one).

These items cannot be considered to be passed with an exam in the ordinary and/or extraordinary calls since it consists on the presenting student's work to other student in the class.

There is not a minimum mark in this activity, but student who does not obtain points in the activity will not opt to more than then 80% of the total score of the course, either in the ordinary or the extraordinary call.

Recoverable assessment items

Besides that, the course will be composed of three assessment items more:

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

Students are required to obtain a minimum mark of 4 points (out of 10) in the theory exam and in each project. 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. If any of these activities is graded lower than 5 points, the student will be able to be assessed again of the respective activity.

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.), according to article 13 of the assessment regulations, it will be considered as academic fraud.
- According to this same article, all students involved in the fraud will be graded with 0 points (out of 10) in the corresponding call and professors may prepare a special exam only for them in the next official call to assess the learning results of 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.
- If a student is involved in a fraudulent behaviour, their marks will not be kept for the extraordinary call. Additionally, no marks will be kept between calls of future academic years.
- 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.

This course is related to the Sustainable Development Goals 4 "Quality education".