ANX-PR/CL/001-01

LEARNING GUIDE

SUBJECT

103000590 - Computer Security

DEGREE PROGRAMME

10AK - Master Universitario En Software Y Sistemas

ACADEMIC YEAR & SEMESTER

2021/22 - Semester 1

Index

Learning guide

1. Description

1.1. Subject details

Name of the subject	103000590 - Computer Security
No of credits	4 ECTS
Type	Optional
Academic year ot the programme	First year
Semester of tuition	Semester 1
Tuition period	September-January
Tuition languages	English
Degree programme	10AK - Master Universitario en Software y Sistemas
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 *
Julio Mariño Carballo	D-2308	julio.marino@upm.es	Tu - 15:00 - 17:00 W - 12:30 - 13:30 Th - 15:00 - 17:00 F - 12:30 - 13:30 Please get in touch with the instructor to get an appointment in order to check his availability.

Manuel Carro Liñares (Subject coordinator)	2303	manuel.carro@upm.es	F - 15:00 - 19:00 Please send an e-mail to set up an appointment before going to the instructor's office.

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

2.3. External faculty

Name and surname	Email	Institution
Pedro Moreno	pedro.moreno@imdea.org	IMDEA Software Institute
Juan Caballero	Juan.caballero@imdea.org	IMDEA Software Institute
Marco Guarnieri	marco.guarnieri@imdea.org	IMDEA Software Institute
Dario Fiore	Dario.Fiore@imdea.org	IMDEA Software Institute
Alessandra Gorla	alessandra.gorla@imdea.org	IMDEA Software Institute

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

- An undergraduate level course on computer security is desired but not required. Some demonstrable knowledge on the basic principles of computer security is necessary.

4. Skills and learning outcomes *

4.1. Skills to be learned

CEM8 - Aplicar los fundamentos teóricos y matemáticos adecuados al procesamiento y análisis de funciones y datos de diversa naturaleza, y evaluar y diseñar los métodos relacionados para su aplicación en dominios prácticos

CG1 - Que los estudiantes sepan aplicar los conocimientos adquiridos y su capacidad de resolución de problemas en entornos nuevos o poco conocidos dentro de contextos más amplios (o multidisciplinares) relacionados con su área de estudio.

CG13 - Apreciación de los límites del conocimiento actual y de la aplicación práctica de la tecnología más reciente.

CG4 - Que los estudiantes posean las habilidades de aprendizaje que les permitan continuar estudiando de un modo que habrá de ser en gran medida autodirigido o autónomo.

CG7 - Especificación y realización de tareas informáticas complejas, poco definidas o no familiares

CG8 - Planteamiento y resolución de problemas también en áreas nuevas y emergentes de su disciplina

CG9 - Aplicación de los métodos de resolución de problemas más recientes o innovadores y que puedan implicar el uso de otras disciplinas

CGI20 - Adquirir conocimientos científicos avanzados del campo de la informática que le permitan generar nuevas ideas dentro de una línea de investigación.

CGI23 - Capacidad de leer y comprender publicaciones dentro de su ámbito de estudio/investigación, así como su catalogación y valor científico

4.2. Learning outcomes

RA13 - Select and apply optimization methods to specific problems

RA12 - Be familiar with examples of real applications and research trends and lines

RA15 - Knowledge of techniques for proving code correctness

RA112 - Identify computer security threats and decide the best proactive and reactive measures against them

* 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 gives students a general view of Computer Security. Lectures are divided in independent blocks which provide basic concepts in Computer Security, such as cryptography, software security, information access control, communication network security, or privacy. Each block includes a theory part to give students the basic concepts and a practical exercise to demonstrate and fix the presented concepts. The particular order and length of the topics in the blocks will depend on the schedule of the instructors.

5.2. Syllabus

1. Cryptography

2. Software Security

3. Information Access Control

4. Network security

5. Privacy

6. Schedule

6.1. Subject schedule*

Week	Face-to-face classroom activities	Face-to-face laboratory activities	Distant / On-line	Assessment activities
1	**Cryptography** Duration: 02:00 Lecture		**Cryptography** Duration: 02:00 Lecture	
2	**Cryptography** Duration: 02:00 Lecture		**Cryptography** Duration: 02:00 Lecture	
3	**Cryptography** Duration: 02:00 Lecture		**Cryptography** Duration: 02:00 Lecture	
4	**Cryptography** Duration: 02:00 Lecture		**Cryptography** Duration: 02:00 Lecture	
5	**Cryptography** Duration: 02:00 Lecture		**Cryptography** Duration: 02:00 Lecture	**Practical problem / exercise** Individual work Continuous assessment Not Presential Duration: 02:00
6	**Network security** Duration: 02:00 Lecture		**Network security** Duration: 02:00 Lecture	
7	**Network security** Duration: 02:00 Lecture		**Network security** Duration: 02:00 Lecture	
8	**Network security** Duration: 02:00 Lecture		**Network security** Duration: 02:00 Lecture	**Practical problem / exercise** Individual work Continuous assessment Not Presential Duration: 02:00
9	**Software security** Duration: 02:00 Lecture		**Software security** Duration: 02:00 Lecture	
10	**Software security** Duration: 02:00 Lecture		**Software security** Duration: 02:00 Lecture	
11	**Software security** Duration: 02:00 Lecture		**Software security** Duration: 02:00 Lecture	**Practical problem / exercise** Individual work Continuous assessment Not Presential Duration: 02:00
12	**Physical security** Duration: 02:00 Lecture		**Physical security** Duration: 02:00 Lecture	

13	**Physical security** Duration: 02:00 Lecture		**Physical security** Duration: 02:00 Lecture	
14	**Physical security** Duration: 02:00 Lecture		**Physical security** Duration: 02:00 Lecture	**Practical problem / exercise** Individual work Continuous assessment Not Presential Duration: 02:00
15	**Seminar / TBD** Duration: 02:00 Lecture		**Seminar / TBD** Duration: 02:00 Lecture	
16				
17				**Final exam** Written test Continuous assessment Presential Duration: 02:00 **Comprehensive exam** Written test 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
5	Practical problem / exercise	Individual work	No Presential	02:00	15%	0 / 10	CG4 CG8 CG9 CG1 CG7 CG13 CGI20 CEM8 CGI23
8	Practical problem / exercise	Individual work	No Presential	02:00	15%	0 / 10	CG4 CG8 CG9 CG1 CG7 CG13 CGI20 CEM8 CGI23
11	Practical problem / exercise	Individual work	No Presential	02:00	15%	0 / 10	CG4 CG8 CG9 CG1 CG7 CG13 CGI20 CEM8 CGI23
14	Practical problem / exercise	Individual work	No Presential	02:00	15%	0 / 10	CG4 CG8 CG9 CG1 CG7 CG13 CGI20 CEM8 CGI23

17	Final exam	Written test	Face-to-face	02:00	40%	0 / 10	CG4 CG8 CG9 CG1 CG7 CG13 CGI20 CEM8 CGI23

7.1.2. Final examination

Week	Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
17	Comprehensive exam	Written test	Face-to-face	02:00	100%	5 / 10	CG4 CG8 CG9 CG1 CG7 CG13 CGI20 CEM8 CGI23

7.1.3. Referred (re-sit) examination

Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
Exam for the students who did not pass the course using continuous assesment.	Written test	Face-to-face	02:00	100%	5 / 10	CG4 CG8 CG9 CG1 CG7 CG13 CGI20 CEM8 CGI23

7.2. Assessment criteria

8. Teaching resources

8.1. Teaching resources for the subject

Name	Type	Notes
Various	Others	Will be decided based on the selected topics.

9. Other information

9.1. Other information about the subject

The health situation caused by the COVID-19 may require restricting the occupation of the classroom and have a mixed model (face-to-face + online) for teaching. There may be turns for students inside each group, so that every week one of the turns may have to attend lectures in person while the rest of the turns will tune in remotely. Turns will rotate in attending the classrom.

If the health conditions are good enough, all students will attend lectures physically,.

If the health conditions worsen, lectures will shift to a remote-teaching mode. Face-to-face evaluation tests will be performed online.