ANX-PR/CL/001-01

LEARNING GUIDE

SUBJECT

103000934 - Software Verification And Validation

DEGREE PROGRAMME

10AZ - Master Universitario En Innovación Digital

ACADEMIC YEAR & SEMESTER

2021/22 - Semester 1

Index

Learning guide

1. Description

1.1. Subject details

Name of the subject	103000934 - Software Verification And Validation
No of credits	6 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	2021-22

2. Faculty

2.1. Faculty members with subject teaching role

Name and surname	Office/Room	Email	Tutoring hours *
Sira Vegas Hernandez (Subject coordinator)	5105	sira.vegas@upm.es	M - 12:00 - 15:00 Th - 14:00 - 17:00
Natalia Juristo Juzgado	5104	natalia.juristo@upm.es	Sin horario.

* 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

- Programación

- JAVA and C programming languages

4. Skills and learning outcomes *

4.1. Skills to be learned

CB07 - 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

CB08 - Que los estudiantes sean capaces de integrar conocimientos y enfrentarse a la complejidad de formular juicios a partir de una información que, siendo incompleta o limitada, incluya reflexiones sobre las responsabilidades sociales y éticas vinculadas a la aplicación de sus conocimientos y juicios

CB09 - Que los estudiantes sepan comunicar sus conclusiones y los conocimientos y razones últimas que las sustentan a públicos especializados y no especializados de un modo claro y sin ambigüedades

CG03 - La capacidad de usar la lengua inglesa de manera competente, es decir, con capacitación para tareas complejas de trabajo y estudio.

CG06 - Capacidad para gestionar la información.

4.2. Learning outcomes

RA124 - Know and apply product and process quality control techniques

RA126 - Document the testing process

RA125 - Know and determine the most appropriate verification and validation techniques to be applied in a software development project with the aim of assuring the quality level required

* 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

No hay descripción de la asignatura.

5.2. Syllabus

1. Introduction
   - 1.1. Introduction to V&V
   - 1.2. V&V and the software development process
   - 1.3. V&V and the software development products
2. Static evaluation
   - 2.1. Introduction to static evaluation
   - 2.2. Static evaluation techniques
   - 2.3. Reading techniques
3. Dynamic evaluation: Software testing
   - 3.1. Introduction to software testing
   - 3.2. Testing levels
   - 3.3. The testing process
   - 3.4. Software verification and validation plan
   - 3.5. Testing tools

6. Schedule

6.1. Subject schedule*

Week	Face-to-face classroom activities	Face-to-face laboratory activities	Distant / On-line	Assessment activities
1	**Course introduction** Duration: 01:00 **Static evaluation** Duration: 01:00 **Introduction to software testing** Duration: 02:00		**Course introduction** Duration: 01:00 **Static evaluation** Duration: 01:00 **Introduction to software testing** Duration: 02:00	
2	**Static evaluation** Duration: 02:00 **Dynamic evaluation** Duration: 02:00		**Static evaluation** Duration: 02:00 **Dynamic evaluation** Duration: 02:00	
3	**Static evaluation** Duration: 01:00 **Static evaluation** Duration: 01:00 **Dynamic evaluation** Duration: 02:00		**Static evaluation** Duration: 01:00 **Static evaluation** Duration: 01:00 **Dynamic evaluation** Duration: 02:00	
4	**Dynamic evaluation** Duration: 02:00		**Dynamic evaluation** Duration: 02:00	**Static techniques exercise** Continuous assessment Presential Duration: 02:00
5	**Static evaluation** Duration: 01:00 **Static evaluation** Duration: 01:00		**Static evaluation** Duration: 01:00 **Static evaluation** Duration: 01:00	**White box exercise** Continuous assessment Presential Duration: 02:00
6	**Static evaluation** Duration: 02:00 **Dynamic evaluation** Duration: 02:00		**Static evaluation** Duration: 02:00 **Dynamic evaluation** Duration: 02:00	

7	**Dynamic evaluation** Duration: 02:00		**Dynamic evaluation** Duration: 02:00	
8				**Black box exercise** Continuous assessment Presential Duration: 02:00
9	**Dynamic evaluation** Duration: 02:00		**Dynamic evaluation** Duration: 02:00	
10	**Dynamic evaluation** Duration: 02:00		**Dynamic evaluation** Duration: 02:00	
11				**Assignment: testing a software system** Continuous assessment Presential Duration: 02:00
12	**Assignment follow-up** Duration: 02:00		**Assignment follow-up** Duration: 02:00	
13	**Assignment follow-up** Duration: 02:00		**Assignment follow-up** Duration: 02:00	
14				**Static techniques presentation** Continuous assessment Presential Duration: 02:00 **Assignment: testing a software system** Continuous assessment Presential Duration: 02:00
15				**Student's attitude regarding lectures and course in general** Continuous assessment Presential Duration: 02:00
16				**Final exam** Final examination Presential Duration: 02:00
17				

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
4	Static techniques exercise		Face-to-face	02:00	10%	/ 10	CG06 CB07
5	White box exercise		Face-to-face	02:00	10%	/ 10	CG06 CB07
8	Black box exercise		Face-to-face	02:00	10%	/ 10	CG06 CB07
11	Assignment: testing a software system		Face-to-face	02:00	20%	/ 10	CB08 CG03 CG06 CB09 CB07
14	Static techniques presentation		Face-to-face	02:00	20%	/ 10	CB08 CG03 CG06 CB09 CB07
14	Assignment: testing a software system		Face-to-face	02:00	20%	/ 10	CB08 CG03 CG06 CB09 CB07
15	Student's attitude regarding lectures and course in general		Face-to-face	02:00	10%	/ 10	CB08 CG03 CG06 CB09 CB07

7.1.2. Final examination

Week	Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
16	Final exam		Face-to-face	02:00	100%	5 / 10	CB08 CG03 CG06 CB09 CB07

7.1.3. Referred (re-sit) examination

Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
Students who have followed the continuous evaluation mode will have to re-submit all evaluation tasks that do not reach the minimum score required. The attitude score will be taken from the regular period.		Face-to-face	02:00	100%	5 / 10	CB08 CG03 CG06 CB09 CB07
Students who have followed the final exam evaluation mode will have to repeat the final exam.		Face-to-face	02:00	100%	5 / 10	CB08 CG03 CG06 CB09 CB07

7.2. Assessment criteria

Continuous evaluation mode:

The score of the course is calculated regarding the performance of the student in the different tasks that (s)he has been assigned:

- Exercise applying white box techniques to a program (10% of the score).

- Exercise applying black box techniques to a program (10% of the score).

- Exercise applying reading techniques (10% of the score).

- Assignment performing testing on a software system (40% of the score).

- Assignment about static techniques (20% of the score)

It will also be taken into consideration for the score of the course the participation and attitude of the student during the lectures and regarding the course in general (10%).

Students who fail to submit any of the evaluation tasks (exercises or assignment) will automatically fail the course.

Final exam evaluation mode:

The score of the course is calculated based on the score of the final exam.

Extraordinary evaluation:

Students who have followed the continuous evaluation mode will have to re-submit all evaluation tasks that do not reach the minimum score required. The attitude score will be taken from the regular period.

Students who have followed the final exam evaluation mode will have to repeat the final exam.

8. Teaching resources

8.1. Teaching resources for the subject

Name	Type	Notes
B. Beizer. "Software Testing Techniques" 2ª Edición. 1990	Bibliography	
G. J. Myers. "The Art of Software Testing" 2ª Edición. Wiley. 2004.	Bibliography	
P.C. Jorgensen. Software Testing. A Craftsman?s Approach. CRC Press, 1995.	Bibliography	
C. Kaner, J. Falk, H.Q. Nguyen. Testing Computer Software. Wiley, 1999.	Bibliography	
W.E. Perry. Effective methods for software testing. Tercera edición. Wiley. 2006	Bibliography	
S.L. Pfleeger. Ingeniería de software: teoría y práctica. Segunda edición. Prentice Hall. 2002	Bibliography	

IEEE V&V standards	Bibliography	
Sitio Moodle de la asignatura	Web resource	