



POLITÉCNICA

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PR/CL/001



E.T.S. de Ingenieros
Informaticos

ANX-PR/CL/001-01

LEARNING GUIDE

SUBJECT

103000385 - Software Verification And Validation

DEGREE PROGRAMME

10AK - Master Universitario En Software Y Sistemas

ACADEMIC YEAR & SEMESTER

2021/22 - Semester 1

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1. Description

1.1. Subject details

Name of the subject	103000385 - Software Verification And Validation
No of credits	4 ECTS
Type	Optional
Academic year of 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 *
Sira Vegas Hernandez (Subject coordinator)	5105	sira.vegas@upm.es	M - 13:00 - 16:00 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
- Lenguajes de programación C y JAVA

4. Skills and learning outcomes *

4.1. Skills to be learned

CEM1 - Identificar, a partir del estado de la cuestión, la presencia de problemas de investigación relacionados con la concepción, la construcción, el uso y la evaluación de sistemas sociotécnicos complejos que hagan un uso intensivo de software

CEM4 - Analizar y evaluar los diferentes paradigmas y enfoques de ingeniería de construcción y gestión de sistemas basados en software.

CEM5 - Aportar soluciones a aquellos problemas abiertos relacionados con el ámbito de aplicación y los métodos, técnicas y herramientas de Verificación y Validación de Software

CG12 - Comprensión amplia de las técnicas y métodos aplicables en una especialización concreta, así como de sus límites

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

CG14 - Conocimiento y comprensión de la informática necesaria para la creación de modelos de información, y de los sistemas y procesos complejos

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

CG120 - Adquirir conocimientos científicos avanzados del campo de la informática que le permitan generar nuevas ideas dentro de una línea de investigación.

CG123 - Capacidad de leer y comprender publicaciones dentro de su ámbito de estudio/investigación, así como su catalogación y valor científico

4.2. Learning outcomes

RA42 - Seleccionar la técnica de verificación/validación de software más adecuada para un proyecto determinado

RA41 - Aplicar efectivamente las técnicas de verificación y validación de software

* 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. Dynamic evaluation: Software testing
 - 2.1. Introduction to software testing
 - 2.2. Testing levels
 - 2.3. The testing process
 - 2.4. Software verification and validation plan
 - 2.5. 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	Introducción Duration: 02:00 Lecture		Introducción Duration: 02:00 Lecture	
2	Introducción Duration: 02:00 Lecture		Introducción Duration: 02:00 Lecture	
3	Evaluación dinámica Duration: 02:00 Lecture		Evaluación dinámica Duration: 02:00 Lecture	
4	Evaluación dinámica Duration: 02:00 Problem-solving class		Evaluación dinámica Duration: 02:00 Problem-solving class	
5				White box exercise Individual work Continuous assessment Presential Duration: 02:00
6	Evaluación dinámica Duration: 02:00 Lecture		Evaluación dinámica Duration: 02:00 Lecture	
7	Evaluación dinámica Duration: 02:00 Problem-solving class		Evaluación dinámica Duration: 02:00 Problem-solving class	
8				Black box exercise Individual work Continuous assessment Presential Duration: 02:00
9	Evaluación dinámica Duration: 02:00 Lecture Evaluación dinámica Duration: 02:00 Lecture		Evaluación dinámica Duration: 02:00 Lecture Evaluación dinámica Duration: 02:00 Lecture	
10	Evaluación dinámica Duration: 02:00 Problem-solving class		Evaluación dinámica Duration: 02:00 Problem-solving class	
11				Assignment: testing a software system Individual work Continuous assessment Presential Duration: 02:00

12	Seguimiento de la práctica Duration: 02:00 Cooperative activities		Seguimiento de la práctica Duration: 02:00 Cooperative activities	
13	Seguimiento de la práctica Duration: 02:00 Cooperative activities		Seguimiento de la práctica Duration: 02:00 Cooperative activities	
14				Assignment: testing a software system Individual work Continuous assessment Presential Duration: 02:00
15				Student's attitude regarding lectures and course in general Other assessment Continuous assessment Presential Duration: 02:00
16				
17				Final 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	White box exercise	Individual work	Face-to-face	02:00	15%	5 / 10	CG4 CEM1 CEM5 CG7 CG12 CG14 CEM4 CGI23
8	Black box exercise	Individual work	Face-to-face	02:00	15%	5 / 10	CG4 CEM1 CEM5 CG7 CG12 CG14 CEM4 CGI23
11	Assignment: testing a software system	Individual work	Face-to-face	02:00	30%	5 / 10	CG8 CG9 CEM1 CEM5 CG13 CGI20 CEM4
14	Assignment: testing a software system	Individual work	Face-to-face	02:00	30%	5 / 10	CG8 CG9 CEM1 CEM5 CG13 CGI20 CEM4
15	Student's attitude regarding lectures and course in general	Other assessment	Face-to-face	02:00	10%	0 / 10	CG4 CG7 CG12 CG13 CG14

7.1.2. Final examination

Week	Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
17	Final exam	Written test	Face-to-face	02:00	100%	5 / 10	CG4 CG7 CG12 CG13 CG14 CGI23 CG8 CG9 CEM1 CEM5 CEM4 CGI20

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.	Individual presentation	Face-to-face	02:00	100%	5 / 10	CG4 CG7 CG12 CG13 CG14 CGI23 CG8 CG9 CEM1 CEM5 CEM4 CGI20
Students who have followed the final exam evaluation mode will have to repeat the final exam.	Written test	Face-to-face	02:00	100%	5 / 10	CG4 CG7 CG12 CG13 CG14 CGI23 CG8 CG9 CEM1 CEM5 CEM4

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 (15% of the score).
- Exercise applying black box techniques to a program (15% of the score).
- Assignment performing testing on a software system (60% 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	