



POLITÉCNICA

INTERNATIONAL
CAMPUS OF
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COORDINATION PROCESS OF
LEARNING ACTIVITIES
PR/CL/001



E.T.S. de Ingenieros
Informáticos

ANX-PR/CL/001-01

LEARNING GUIDE

SUBJECT

103000483 - Software Design

DEGREE PROGRAMME

10AM - Master Universitario En Ingenieria Del Software

ACADEMIC YEAR & SEMESTER

2021/22 - Semester 2

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1. Description

1.1. Subject details

Name of the subject	103000483 - Software Design
No of credits	4 ECTS
Type	Compulsory
Academic year of the programme	First year
Semester of tuition	Semester 2
Tuition period	February-June
Tuition languages	English
Degree programme	10AM - Master Universitario en Ingeniería del Software
Centre	10 - Escuela Técnica Superior De Ingenieros Informáticos
Academic year	2021-22

2. Faculty

2.1. Faculty members with subject teaching role

Name and surname	Office/Room	Email	Tutoring hours *
Nelson Medinilla Martínez (Subject coordinator)	5109	nelson.medinilla@upm.es	M - 16:00 - 18:00
Natalia Juristo Juzgado	5110	natalia.juristo@upm.es	M - 08:00 - 08:15

* 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

- Object Oriented Programming

4. Skills and learning outcomes *

4.1. Skills to be learned

CE12 - Concebir y realizar el diseño de los sistemas software asegurando atributos relevantes de calidad.

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 (RD)

CG10 - Capacidad de pensamiento creativo con el objetivo de desarrollar enfoques y métodos nuevos y originales

CG11 - Integración del conocimiento a partir de disciplinas diferentes, así como el manejo de la complejidad

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

CG18 - Capacidad de trabajar y comunicarse también en contextos internacionales

CG3 - 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 (RD)

4.2. Learning outcomes

RA16 - The student will be able to evaluate any software system design.

RA14 - The student will be able to design a software system according to requirements, restrictions, quality standards, and developer criteria

RA15 - The student will be able to document each new design.

RA23 - Time organization capability SC13, SC14 K

RA22 - Observing capability SC13, SC14, CG10 C

RA27 - Negotiation skill SC13, SC14, CG18 C

RA25 - Communication skills in public SC13, SC14, CG3, CG18 S

RA24 - Conflict solving capability SC13, SC14, CG18 C

RA21 - Listening capability SC13, SC14, CG10 A

RA26 - Group work skill SC13, SC14, CG17 A

* 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

The course Software Design is aimed at enhancing human efficiency in software development. Therefore, the purpose of this course is to develop the skills to design software systems such that meet the following conditions (set by Parnas): Managerial, Flexibility, Comprehension.

These are the skills that will be evaluated in the course.

The course is essentially practical; it relies on a small and intense theoretical core: Near Decomposable Systems, Information Hiding Principle and Bi-dimensional Complexity.

Difficulties (hard):

These skill are creative, no algorithms or recipes for a design that meets the conditions set by Parnas.

Very often we have entrenched ideas that hinder the acquisition of the necessary skills.

5.2. Syllabus

1. Software Engineering Two-dimensional Complexity
2. System Software Design Features
3. Object Oriented Review
4. Design and Dominion Patterns

6. Schedule

6.1. Subject schedule*

Week	Face-to-face classroom activities	Face-to-face laboratory activities	Distant / On-line	Assessment activities
1	Software Engineering Two-dimensional Complexity Duration: 02:00 Lecture			
2	Object Oriented Review Duration: 02:00 Lecture			
3	Workshop Duration: 02:00 Cooperative activities			
4	System Software Design Features Duration: 02:00 Lecture			
5	Workshop Duration: 02:00 Cooperative activities			
6	Workshop Duration: 02:00 Cooperative activities			Test Online test Continuous assessment Presential Duration: 00:30
7	Workshop Duration: 02:00 Cooperative activities			
8	Design and Dominion Patterns Duration: 02:00 Lecture			
9	Workshop Duration: 02:00 Cooperative activities			Test Online test Continuous assessment Presential Duration: 00:30
10	Workshop Duration: 02:00 Cooperative activities			
11	Workshop Duration: 02:00 Cooperative activities			
12	Workshop Duration: 02:00 Cooperative activities			

13	Workshop Duration: 02:00 Cooperative activities			
14	Workshop Duration: 02:00 Cooperative activities			Oral presentation of the final work Group work Continuous assessment Presential Duration: 02:00
15				
16				Final test Individual work 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
6	Test	Online test	Face-to-face	00:30	20%	/ 10	CE12 CG11
9	Test	Online test	Face-to-face	00:30	25%	/ 10	CE12 CG11
14	Oral presentation of the final work	Group work	Face-to-face	02:00	55%	5 / 10	CG10 CG14 CG1 CG18 CE12 CG11 CG3

7.1.2. Final examination

Week	Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
16	Final test	Individual work	Face-to-face	02:00	100%	5 / 10	CG1 CG10 CG14 CG18 CE12 CG11 CG3

7.1.3. Referred (re-sit) examination

Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
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Global test	Individual work	Face-to-face	02:00	100%	5 / 10	CG11 CE12 CG10
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7.2. Assessment criteria

The course applies a continuous evaluation through individual evaluation activities (45%) and a final work as a team (55%).

All assessment activities are mandatory.

In accordance with established standards you may opt for an evaluation only for final test. In this case they can not assess the skills related to social issues.

The evaluation by only final test will consist of a test-type exam (45%) and the development of a software system that works and meets the design criteria of the subject (55%).

8. Teaching resources

8.1. Teaching resources for the subject

Name	Type	Notes
Moodle	Bibliography	It contains or addresses the fundamental literature