ANX-PR/CL/001-01

LEARNING GUIDE

SUBJECT

103000483 - Software design

DEGREE PROGRAMME

10AM - Master Universitario en Ingenieria del Software

ACADEMIC YEAR & SEMESTER

2017/18 - Semester 2

Index

Learning guide

1. Description

1.1. Subjet details

Name of the subject	103000483 - Software design
No of credits	4 ECTS
Type	Compulsory
Academic year ot the programme	First year
Semester of tuition	Semester 2
Tuition period	February-June
Tuition languages	English
Degree programme	10AM - Master Universitario en Ingenieria del Software
Centre	Escuela Tecnica Superior de Ingenieros Informaticos
Academic year	2017-18

2. Faculty

2.1. Faculty members with subject teaching role

Name and surname	Office/Room	Email	Tutoring hours *
Nelson Medinilla Martinez (Subject coordinator)	5109	nelson.medinilla@upm.es	M - 16:00 - 18:00

* 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

El plan de estudios Master Universitario en Ingenieria del Software no tiene definidas asignaturas previas recomendadas para esta asignatura.

3.2. Other recommended learning outcomes

- Object Oriented Programming

4. Skills and learning outcomes *

4.1. Skills to be learned

CE1 - Elaborar un plan de proyecto que permita coordinar y priorizar recursos y actividades para obtener los resultados esperados en los plazos, costes y calidad establecidos

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

CE4 - Aplicar los modelos de proceso de desarrollo a las características de un proyecto software

CE5 - Educir, analizar y especificar las necesidades de los clientes, usuarios y otras partes interesadas, teniendo en cuenta los posibles condicionantes que pudieran afectar al sistema a desarrollar

CE6 - Diseñar las pruebas de los módulos y ayudar a diseñar las pruebas de integración e instalación. Realizar la integración del sistema, las pruebas de integración y la instalación.

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

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)

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 (RD)

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

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	Other face-to-face activities	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				**Oral presentation of the first stage of software development system and associated technical documents** Group presentation Continuous assessment Duration: 02:00
7	**Workshop** Duration: 02:00 Cooperative activities			
8	**Design and Dominion Patterns** Duration: 02:00 Lecture			
9	**Workshop** Duration: 02:00 Cooperative activities			
10	**Workshop** Duration: 02:00 Cooperative activities			
11				**Oral presentation of the second stage of software development system and associated technical documents** Group presentation Continuous assessment Duration: 02:00
12	**Workshop** Duration: 02:00 Cooperative activities			

13	**Workshop** Duration: 02:00 Cooperative activities			
14	**Workshop** Duration: 02:00 Cooperative activities			
15	**Workshop** Duration: 02:00 Cooperative activities			
16				**Oral presentation of the third stage of software development system and associated technical documents** Group work Continuous assessment Duration: 02:00 **Evaluating relevant contributions** Other assessment Continuous assessment Duration: 00:00
17				**Final test** Individual work Final examination Duration: 02:00

The independent study hours are training activities during which students should spend time on individual study or individual assignments.

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 subject schedule is based on a previous theorical planning of the subject plan and might go to through experience some unexpected changes along throughout the academic year.

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	Oral presentation of the first stage of software development system and associated technical documents	Group presentation	Face-to-face	02:00	10%	5 / 10	CE4 CE5 CE1 CE6 CG11 CE12 CG10 CG3 CG7 E CG4
11	Oral presentation of the second stage of software development system and associated technical documents	Group presentation	Face-to-face	02:00	30%	5 / 10	CE4 CE5 CE1 CE6 CG11 CE12 CG10 CG3 CG7 E CG4
16	Oral presentation of the third stage of software development system and associated technical documents	Group work	Face-to-face	02:00	55%	5 / 10	CE4 CE5 CE1 CE6 CG11 CE12 CG10 CG3 CG7 E CG4
16	Evaluating relevant contributions	Other assessment	Face-to-face	00:00	5%	/ 10	

7.1.2. Final examination

Week	Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
17	Final test	Individual work	Face-to-face	02:00	100%	5 / 10	CE4 CE5 CG11 CE12 CG10 CG7 E

7.1.3. Referred (re-sit) examination

Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
Global test	Written test	Face-to-face	02:00	100%	5 / 10	CG11 CE12 CG10 CG7 E

7.2. Assessment criteria

The course applies a continuous evaluation through three evaluation activities around the development of a software system. Evaluates work as a team.

The three activities evaluated oral presentations and technical documentation of the three stages of system development. The weights of each activity will increase gradually.

Reserves 5% of the assessment to consider relevant contributions, particularly associated with the ability of independent learning.

All assessment activities are mandatory.

Each assessment activity includes the full set of competencies referred, given the integrative nature (holistic) of these activities.

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.

8. Teaching resources

8.1. Teaching resources for the subject

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