

## [GIH203] SOFTWARE ENGINEERING

### GENERAL INFORMATION

|                  |                                |                   |                         |  |
|------------------|--------------------------------|-------------------|-------------------------|--|
| <b>Studies</b>   | DEGREE IN COMPUTER ENGINEERING |                   | <b>Subject</b>          | SOFTWARE ENGINEERING, INFORMATION SYSTEMS AND SMART SYSTEMS      |
| <b>Semester</b>  | 1                              | <b>Course</b>     | 3                       | <b>Mention / Field of specialisation</b>                         |
| <b>Character</b> | COMPULSORY                     |                   | <b>Language</b>         | ENGLISH  |
| <b>Plan</b>      | 2017                           | <b>Modality</b>   | Adapted<br>Face-to-face | <b>Total hours</b>   |
| <b>Credits</b>   | 4,5                            | <b>Hours/week</b> | 3.75                    | 67.5 class hours + 45 non-class hours = <b>112.5 total hours</b> |

### PROFESSORS

ALDALUR CEBERIO, IÑIGO

### REQUIRED PREVIOUS KNOWLEDGE

| Subjects                                 | Knowledge                        |
|--|----------------------------------|
| (No specific previous subjects required) | (No previous knowledge required) |

### SKILLS

#### VERIFICA SKILLS

##### SPECIFIC

**GICE04** - To be able to draft the technical conditions of a computer technology installation to comply with the standards and regulations in force

**GICE05** - To have knowledge of the computer technology rules and regulations in the national, European and international contexts.

**GICE06** - To understand and be able to apply software engineering life cycles, methods and principles.

**GICE09** - To analyse, design, build and maintain secure, efficient and robust applications, choosing the most suitable model and programming languages

##### GENERAL

**GIGC01** - To be able to conceive, draft, organise, plan, develop and sign computer technology engineering projects focusing on the design, development or use of computer technology systems, services and applications.

**GIGC02** - To be able to manage activities, subject of the projects in the field of computer technologies

**GIGC03** - To be able to design, develop, evaluate and ensure the accessibility, ergonomics, usability and security of computer services, applications and systems and the information they manage.

**GIGC05** - To be able to conceive, develop and maintain computer systems, services and applications, using the software engineering methods in order to ensure quality

##### BASIC

**G\_CB2** - To be able to apply knowledge to occupational or professional tasks; have the necessary skills to pose and defend arguments, and to solve problems within their field of study

**G\_CB4** - To be able to communicate information, ideas, problems and solutions to both expert and lay audiences

**G\_CB5** - To have developed learning abilities required to embark on subsequent studies with a high level of autonomy.

### LEARNING RESULTS

**RG301** Assumes responsibilities in the work team, organizing and planning the tasks to be developed, facing the contingencies and encouraging the participation of its members.

#### LEARNING ACTIVITIES

|   | CH   | NCH  | TH   |
|---|------|------|------|
| Development, writing and presentation of memorandums, reports, audiovisual material, etc. | 2 h. | 2 h. | 4 h. |
| Relating to projects/POPBLs carried out individually or in teams                          |      |      |      |

#### EVALUATION SYSTEM

|   | W    |
|---|------|
| Technical skills, involvement in the project, finished work, obtained results, handed documentation, presentation and technical defence | 100% |

**Comments:** Continuous assessment.

#### MAKE-UP MECHANISMS

(No mechanisms)

**CH - Class hours:** 2 h.

**NCH - Non-class hours:** 2 h.

**TH - Total hours:** 4 h.

**RG302** Analyze the intervening variables in the problem and propose actions for a stable situation.

**LEARNING ACTIVITIES**

|   | CH   | NCH  | TH   |
|---|------|------|------|
| Development, writing and presentation of memorandums, reports, audiovisual material, etc.<br>Relating to projects/POPBLs carried out individually or in teams | 2 h. | 1 h. | 3 h. |

**EVALUATION SYSTEM**

W

Technical skills, involvement in the project, finished work, obtained results, handed documentation, presentation and technical defence

**Comments:** Continuous assessment.

**MAKE-UP MECHANISMS**

(No mechanisms)

CH - Class hours: 2 h.

NCH - Non-class hours: 1 h.

TH - Total hours: 3 h.

**RG194** [!] *Análisis de los impactos de los ODS en el proyecto realizado*

**LEARNING ACTIVITIES**

|   | CH   | NCH  | TH   |
|---|------|------|------|
| Development, writing and presentation of memorandums, reports, audiovisual material, etc.<br>Relating to projects/POPBLs carried out individually or in teams | 2 h. | 1 h. | 3 h. |

**EVALUATION SYSTEM**

W

Technical skills, involvement in the project, finished work, obtained results, handed documentation, presentation and technical defence

**Comments:** Continuous assessment.

**MAKE-UP MECHANISMS**

(No mechanisms)

CH - Class hours: 2 h.

NCH - Non-class hours: 1 h.

TH - Total hours: 3 h.

**RG304** Define the problem, develop the solution and present the conclusions in a efficient manner, arguing and justifying each one of them in writing.

**LEARNING ACTIVITIES**

|   | CH   | NCH  | TH   |
|---|------|------|------|
| Development, writing and presentation of memorandums, reports, audiovisual material, etc.<br>Relating to projects/POPBLs carried out individually or in teams | 2 h. | 2 h. | 4 h. |

**EVALUATION SYSTEM**

W

Technical skills, involvement in the project, finished work, obtained results, handed documentation, presentation and technical defence

**Comments:** Continuous assessment. It may be asked to redo the document.

**MAKE-UP MECHANISMS**

(No mechanisms)

CH - Class hours: 2 h.

NCH - Non-class hours: 2 h.

TH - Total hours: 4 h.

**RG305** Define the problem, develop the solution and present the conclusions in a efficient manner, arguing and justifying each one of them in spoken form.

**LEARNING ACTIVITIES**

|   | CH   | NCH  | TH   |
|---|------|------|------|
| Development, writing and presentation of memorandums, reports, audiovisual material, etc. | 3 h. | 1 h. | 4 h. |

Relating to projects/POPBLs carried out individually or in teams

**EVALUATION SYSTEM**

*W*

Technical skills, involvement in the project, finished work, obtained results, handed documentation, presentation and technical defence

**Comments:** Continuous assessment.

**MAKE-UP MECHANISMS**

*(No mechanisms)*

**CH - Class hours:** 3 h.

**NCH - Non-class hours:** 1 h.

**TH - Total hours:** 4 h.

**RGI320 Apply techniques and tools for Validation & Verification: reviews and testing**

**LEARNING ACTIVITIES**

*CH*

*NCH*

*TH*

Individual study and work, tests and evaluations and check points

1 h.

1 h.

Personal study and flexible development of concepts and subjects using active dynamics to promote more meaningful learning

24 h.

14 h.

38 h.

**EVALUATION SYSTEM**

*W*

Written, coding/programming and individual oral tests for the evaluation of technical skills in the field

**Comments:** Minimum grade: 5

**MAKE-UP MECHANISMS**

Written, coding/programming and individual oral tests for the evaluation of technical skills in the field

**Comments:** Students with less than 5 in the Control point must retake the exam. Control point value will be 25% and retake 75%.

**CH - Class hours:** 25 h.

**NCH - Non-class hours:** 14 h.

**TH - Total hours:** 39 h.

**RGI321 Apply techniques and tools for configuration management**

**LEARNING ACTIVITIES**

*CH*

*NCH*

*TH*

Individual study and work, tests and evaluations and check points

1 h.

1 h.

Practices of problem solving and real or simulated context projects

7 h.

3 h.

10 h.

Personal study and flexible development of concepts and subjects using active dynamics to promote more meaningful learning

7 h.

4 h.

11 h.

**EVALUATION SYSTEM**

*W*

Reports of solving exercises, case studies, computer practices, simulation practices and laboratory practices

50%

Written, coding/programming and individual oral tests for the evaluation of technical skills in the field

50%

**Comments:** Minimum grade: 5

**MAKE-UP MECHANISMS**

Written, coding/programming and individual oral tests for the evaluation of technical skills in the field

**Comments:** Students with less than 5 in the Control point must retake the exam. Control point value will be 25% and retake 75%.

**CH - Class hours:** 15 h.

**NCH - Non-class hours:** 7 h.

**TH - Total hours:** 22 h.

**RGI322 Apply software engineering concepts and techniques in the development**

**LEARNING ACTIVITIES**

*CH*

*NCH*

*TH*

Development, writing and presentation of memorandums, reports, audiovisual material, etc.

13 h.

14 h.

27 h.

Relating to projects/POPBLs carried out individually or in teams

Practices of problem solving and real or simulated context projects

3,5 h.

3 h.

6,5 h.

| EVALUATION SYSTEM  | W              | MAKE-UP MECHANISMS   |
|--|----------------|--|
| Reports of solving exercises, case studies, computer practices, simulation practices and laboratory practices<br>Technical skills, involvement in the project, finished work, obtained results, handed documentation, presentation and technical defence<br><b>Comments:</b> It may be asked to redo the document. | 20%<br><br>80% | (No mechanisms)<br><b>Comments:</b> Practice: There will not be any retake. Project: There will not be any retake of the individual defense. |
| <b>CH - Class hours:</b> 16,5 h.<br><b>NCH - Non-class hours:</b> 17 h.<br><b>TH - Total hours:</b> 33,5 h.  |                |  |

## CONTENTS

1. Introduction
2. Best Practices
  - Code Style
  - Documentation
3. Verification & Validation
  - Introduction
  - Static Analysis
    - Sonar
  - Dynamic Analysis
    - JUnit/Katalon
4. Configuration Management
  - Git

## LEARNING RESOURCES AND BIBLIOGRAPHY

### Learning resources

Subject notes  
 Technical articles  
 Moodle Platform

### Bibliography

[http://katalogoa.mondragon.edu/janium-bin/janium\\_login\\_opac\\_re\\_Ink.pl?grupo=INFORMATICA31&ejecuta=20&](http://katalogoa.mondragon.edu/janium-bin/janium_login_opac_re_Ink.pl?grupo=INFORMATICA31&ejecuta=20&)