# [GON301] FUNDAMENTALS OF COMPUTING SCIENCE

## GENERAL INFORMATION

| | | | | | |
|---|---|---|---|---|---|
| **Studies** | DEGREE IN INDUSTRIAL ORGANIZATION ENGINEERING | | | **Subject** | COMPUTING |
| **Semester** | 1 | **Course** | 1 | **Mention / Field of specialisation** | |
| **Character** | BASIC TRAINING | | | | |
| **Plan** | 2022 | **Modality** | Face-to-face | **Language** | EUSKARA |
| **Credits** | 6 | **Hours/week** | 4.83 | **Total hours** | 87 class hours + 63 non-class hours = **150 total hours** |

## PROFESSORS

EREÑO INCERA, ANA MONSERRAT

PEREZ REGUERA, ITZIAR

## REQUIRED PREVIOUS KNOWLEDGE

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

## LEARNING RESULTS

| LEARNING RESULTS | KC | SK | AB | ECTS |
|---|---|---|---|---|
| **G-RA04** - To know the use and programming of computers, operating systems, databases and computer programs with applications in engineering | | x | | 5,4 |
| **G-RTR1** - To develop interdisciplinary projects specific to their specialty and of gradual complexity, - becoming aware of respect for human rights and fundamental rights, and analyzing and assessing the impact of the proposed solutions on the SDGs - to acquire and/or apply basic, advanced and /or avant-garde, demonstrating the ability to work in multidisciplinary teams and/or undertake further studies with a high degree of autonomy | | x | | 0,28 |
| **G-RTR2** - To express information, ideas and the arguments that support them in an orderly, clear and coherent manner, orally and in writing, based on quality information, self-made or obtained from different sources, using inclusive and non-discriminatory language | | x | | 0,32 |
| | | | **Total:** | 6 |

*KC: Knowledge or Content / SK: Skills / AB: Abilities*

| ENAEE LEARNING RESULTS | ECTS |
|---|---|
| **ENAE01** - Knowledge and understanding: Knowledge and understanding of the underlying scientific and mathematical principles in their branch of engineering. | 2 |
| **ENAE04** - Knowledge and understanding: To be aware of the multidisciplinary context of engineering. | 0,52 |
| **ENAE05** - Analysis in engineering: Ability to apply their knowledge and understanding in identifying, formulating and solving engineering problems using established methods. | 1,4 |
| **ENAE08** - Engineering projects: Ability to apply their knowledge in the development and completion of projects which meet specific requirements. | 0,07 |
| **ENAE12** - Research & innovation: Technical and lab competences. | 0,94 |
| **ENAE13** - Practical application of engineering: Ability to select and use suitable equipment, tools and methods. | 0,94 |
| **ENAE17** - Transversal competences: To work effectively, both individually and in a team. | 0,07 |
| **ENAE18** - Transversal competences: To use different methods to communicate effectively with the engineering community and society in general. | 0,07 |
| **Total:** | 6 |

## SECONDARY LEARNING RESULTS

**RGO107** [!] ***Desarrolla y estructura programas para resolver problemas haciendo uso de estructuras de control de flujo, variables y operadores lógicos***

| LEARNING ACTIVITIES | CH | NCH | TH |
|---|---|---|---|
| Development and writing of records, reports, presentations, audiovisual material, etc. on projects/work experience/challenges/case studies/experimental investigations carried out individually and/or in teams | | 3,6 h. | 3,6 h. |
| Conducting tests, giving presentations, presenting defences, taking examinations and/or doing checkpoints | 2 h. | | 2 h. |
| Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects | 13 h. | 2,4 h. | 15,4 h. |
| Carrying out exercises and solving problems individually and/or in teams | 10 h. | 5 h. | 15 h. |

| EVALUATION SYSTEM | W | MAKE-UP MECHANISMS |
|---|---|---|

| EVALUATION SYSTEM | W | MAKE-UP MECHANISMS |
|---|---|---|
| Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems | 10% | *(No mechanisms)* |
| Individual written and/or oral tests or individual coding/programming tests | 90% | |

**CH - Class hours:** 25 h.
**NCH - Non-class hours:** 11 h.
**TH - Total hours:** 36 h.

**RGO108 [!]** ***Automatiza operaciones y organiza el código fuente en funciones para mejorar el proceso de desarrollo de programas y dar solución a problemas genéricos que se les plantea***

| LEARNING ACTIVITIES | CH | NCH | TH |
|---|---|---|---|
| Development and writing of records, reports, presentations, audiovisual material, etc. on projects/work experience/challenges/case studies/experimental investigations carried out individually and/or in teams | | 4,5 h. | 4,5 h. |
| Conducting tests, giving presentations, presenting defences, taking examinations and/or doing checkpoints | 2 h. | | 2 h. |
| Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects | 13 h. | 5 h. | 18 h. |
| Carrying out exercises and solving problems individually and/or in teams | 10 h. | 10,5 h. | 20,5 h. |

| EVALUATION SYSTEM | W | MAKE-UP MECHANISMS |
|---|---|---|
| Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems | 10% | *(No mechanisms)* |
| Individual written and/or oral tests or individual coding/programming tests | 90% | |

**CH - Class hours:** 25 h.
**NCH - Non-class hours:** 20 h.
**TH - Total hours:** 45 h.

**RGO109 [!]** ***Diseña y hace uso de arrays de forma correcta para resolver problemas mediante programas***

| LEARNING ACTIVITIES | CH | NCH | TH |
|---|---|---|---|
| Development and writing of records, reports, presentations, audiovisual material, etc. on projects/work experience/challenges/case studies/experimental investigations carried out individually and/or in teams | | 5,4 h. | 5,4 h. |
| Conducting tests, giving presentations, presenting defences, taking examinations and/or doing checkpoints | 2 h. | | 2 h. |
| Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects | 13 h. | | 13 h. |
| Carrying out exercises and solving problems individually and/or in teams | 13 h. | 20,6 h. | 33,6 h. |

| EVALUATION SYSTEM | W | MAKE-UP MECHANISMS |
|---|---|---|
| Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems | 10% | *(No mechanisms)* |
| Individual written and/or oral tests or individual coding/programming tests | 90% | |

**CH - Class hours:** 28 h.
**NCH - Non-class hours:** 26 h.
**TH - Total hours:** 54 h.

**RGO190** [!] ***Conocer y aplicar las fases para desarrollar de forma guiada, con los objetivos y la planificación previamente definidos, un proyecto de complejidad técnica acorde con los conocimientos de formación básica de la ingeniería. Reflexiona sobre los cono***

| LEARNING ACTIVITIES | *CH* | *NCH* | *TH* |
|---|---|---|---|
| Development and writing of records, reports, presentations, audiovisual material, etc. on projects/work experience/challenges/case studies/experimental investigations carried out individually and/or in teams | 2 h. | 2 h. | 4 h. |

| EVALUATION SYSTEM | *W* | MAKE-UP MECHANISMS |
|---|---|---|
| Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems | 100% | *(No mechanisms)* |

**CH - Class hours:** 2 h.
**NCH - Non-class hours:** 2 h.
**TH - Total hours:** 4 h.

**RGO191** [!] ***Contribuir en la estrategia de funcionamiento del equipo priorizando los objetivos comunes, fomentando y valorando la participación de todas las personas y responsabilizándose de las tareas individuales, así como del cumplimiento de plazos.***

| LEARNING ACTIVITIES | *CH* | *NCH* | *TH* |
|---|---|---|---|
| Development and writing of records, reports, presentations, audiovisual material, etc. on projects/work experience/challenges/case studies/experimental investigations carried out individually and/or in teams | 2 h. | 1 h. | 3 h. |

| EVALUATION SYSTEM | *W* | MAKE-UP MECHANISMS |
|---|---|---|
| Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems | 100% | *(No mechanisms)* |

**CH - Class hours:** 2 h.
**NCH - Non-class hours:** 1 h.
**TH - Total hours:** 3 h.

**RGO193** [!] ***Redacta una memoria de proyecto clara y concisa utilizando las fuentes de información y estructura de memoria facilitadas, y haciendo un uso correcto, inclusivo y no discriminatorio del lenguaje.***

| LEARNING ACTIVITIES | *CH* | *NCH* | *TH* |
|---|---|---|---|
| Development and writing of records, reports, presentations, audiovisual material, etc. on projects/work experience/challenges/case studies/experimental investigations carried out individually and/or in teams | 3 h. | 1 h. | 4 h. |

| EVALUATION SYSTEM | *W* | MAKE-UP MECHANISMS |
|---|---|---|
| Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems | 100% | *(No mechanisms)* |

**CH - Class hours:** 3 h.
**NCH - Non-class hours:** 1 h.
**TH - Total hours:** 4 h.

**RGO194** [!] ***Realiza una presentación oral y defensa del proyecto clara y concisa, haciendo uso correcto, inclusivo y no discriminatorio del lenguaje.***

| LEARNING ACTIVITIES | *CH* | *NCH* | *TH* |
|---|---|---|---|
| Development and writing of records, reports, presentations, audiovisual material, etc. on projects/work experience/challenges/case studies/experimental investigations carried out individually and/or in teams | 2 h. | 2 h. | 4 h. |

| EVALUATION SYSTEM | *W* | MAKE-UP MECHANISMS |
|---|---|---|
| Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems | 100% | *(No mechanisms)* |

**CH - Class hours:** 2 h.
**NCH - Non-class hours:** 2 h.
**TH - Total hours:** 4 h.

## CONTENTS

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1Presentation of the subject2. Installation and configuration of the development environment3. Introducti
on to the subject4. Development of basic programs in the C language5. Functions and decomposition of the
algorithm and code6. Handling of array-s (number vectors)7. Characters and strings (String)8. Data struct
ures and array-s of data structures9. POPBL
```

## LEARNING RESOURCES AND BIBLIOGRAPHY

### Learning resources

Subject notes
Moodle Platform
Class presentations
Computer practical training

### Bibliography

Programazioaren Oinarriak, Iñaki Goirizelaia Ordorika, ISBN: 978-84-8373-139-0

The C Programming Language, Brian W. Kernighan, Dennis M. Ritchie, ISBN: 978-9688802052

C/C++ : curso de programación / Fco. Javier Ceballos Sierra Autor: Ceballos Sierra, Francisco Javier Editorial o distribuidor Ra-Ma Año de impresión: 2019 ISBN: 9788499648125 9788468610610 9788468610627 (e book)