

**COURSE DATA****DATA SUBJECT****Code:** 34888**Name:** Computer Programming**Cycle:** Undergraduate Studies**ECTS Credits:** 6**Academic year:** 2026-27**STUDY (S)**

Degree	Center	Acad. year	Period
1403 - Degree in Telematics Engineering	Escola Tècnica Superior d'Enginyeria	3	First quarter
1935 - Double Degree Program in Mathematics-Telematics Engineering	Facultat de Ciències Matemàtiques	4	First quarter

SUBJECT-MATTER

Degree	Subject-matter	Character
1403 - Degree in Telematics Engineering	Programming	COMPULSORY
1935 - Double Degree Program in Mathematics-Telematics Engineering	Cuarto curso	COMPULSORY

COORDINATION

GUTIERREZ AGUADO JUAN

SUMMARY

The course "**Programming**" is a subject of the third year of the Degree in Telematics Engineering, which covers part of the compulsory subject *Programming*.

In this course, the concepts and skills acquired in the second year course "Aplicación de Informática" are extended. The Java programming language is introduced (object orientation, inheritance, parametrized types and concurrency); Input/Output; network programming with different protocols (UDP, TCP and HTTP); and, distributed programming with RMI.

The student should acquire the ability to develop applications that use all these concepts and



technologies to meet the requirements.

PREVIOUS KNOWLEDGE

RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE

There are no specified enrollment restrictions with other subjects of the curriculum.

OTHER REQUIREMENTS

It is recommended to have studied all the previous subjects in the fields of computer science and Programming .

COMPETENCES / LEARNING OUTCOMES

1403 - Degree in Telematics Engineering

E6 - Ability to design networks and telematic services architectures.

E7 - Ability to programme networked and distributed telematic services and applications.

G3 - Acquisition of the knowledge of the basic and technological subjects that allows students to learn new methods and theories and endows them with the versatility to adapt to new situations.

G4 - Ability to solve problems with initiative, decision-making and creativity, and to communicate and transmit knowledge, abilities and skills, understanding the ethical and professional responsibility of the activity of a telecommunications technical engineer.

R1 - Ability for self-learning of new knowledge and techniques appropriate for the conception, development and exploitation of telecommunications systems and services.

R2 - Ability to use communication and computer applications (offimatics, databases, advanced calculation, project management, visualization, etc.) to support the development and exploitation of telecommunications and electronics networks, services and applications.

R3 - Ability to use computer tools to find bibliographic resources and information related to telecommunications and electronics.

R7 - Understand and use the basic principles of programming for telecommunication networks, systems and services.

DESCRIPTION OF CONTENTS



1. Object orientation in Java

- Background: classes, methods, objects, messages and encapsulation.
- References and primitive types.
- Inheritance, type hierarchy, abstract classes, interfaces and polymorphism.
- Parametrized types, streams and lambda expressions.
- Exceptions.

2. Concurrent programming

- Concurrent task: threads.
- Critical section in shared resources.
- Task synchronization with monitors.

3. Input/Output

- Binary oriented input and output streams.
- Character oriented input and output streams.
- Object serialization

4. Network programming

- Classes for the protocol UDP.
- Classes for the protocol TCP.
- Classes for the protocol HTTP.

5. Distributed programming and middleware

- Middleware
- Distributed programming with RMI

**WORKLOAD****PRESENCIAL ACTIVITIES**

Activity	Hours
Theory	30,00
Laboratory	20,00
Classroom practices	10,00
Total hours	60,00

NON PRESENCIAL ACTIVITIES

Activity	Hours
Attendance at other activities	0,00
Individual or group project	0,00
Independent study and work	30,00
Preparation of lessons	40,00
Preparation for assessment activities	20,00
Resolution of case studies	0,00
Total hours	90,00

TEACHING METHODOLOGY

The methodologies that will be used in this subject are:

- Lectures.
- Problem solving and discussion.
- Laboratory sessions to practice the concepts
- Autonomous study.

The University of Valencia e-learning platform (*Aula Virtual*) will be used to support the communication with students. Through this platform the students will have access to course materials used in class as well as the problems and exercises to solve.

EVALUATION**FIRST CALL:**

The grade is composed of a theoretical and a practical component.

The Theoretical Grade (N_t) considers the following:

- * Exercise Sheets (20%)



* Two Evaluation Tests (80%)

One test will be administered mid-semester, and the other on the date set by the ETSE-UV for the first call. These tests will include theoretical questions, similar questions to those found in the exercise sheets, and may cover content from the laboratories.

The Practical Grade (N_p) consists of the evaluation of the laboratory sessions.

FINAL GRADE

If N_t and N_p are equal to or greater than 4, the final grade will be the weighted average:

$$N_f = 0.7 * N_t + 0.3 * N_p$$

Otherwise, the subject will be failed in the first call, and the grade will be:

$$N_f = \min(N_t, N_p)$$

N_t evaluates the following competencies: G3, G4, R7, E6, and E7

N_p evaluates the following competencies: G3, G4, R1, R7, E6, and E7

SECOND CALL

On the date established by the ETSE for the second call, an exam (N_e) will be conducted, encompassing theoretical aspects, questions, and practical elements.

If N_e and N_p are equal to or greater than 4, the weighted average will be calculated:

$$N_f = 0.7 * N_e + 0.3 * N_p$$

N_e evaluates the following competencies: G3, G4, R7, E6, and E7

In any case, the evaluation of the subject will be done in accordance with the Evaluation and Qualification Regulations of the University of Valencia for undergraduate and master's degrees approved by the Governing Council on May 30, 2017 ([ACGUV 108/2017](#)).

Copying or plagiarism of any activity that is part of the evaluation will result in the impossibility of passing the course, and the student will then be subject to the appropriate disciplinary procedures indicated in the ACTION PROTOCOL FOR FRAUDULENT PRACTICES AT THE UNIVERSITY OF VALENCIA. ([ACGUV 123/2020](#))



).

REFERENCES

- Java in a nutshell. Benjamin J. Evans and David Flanagan. O'Reilly, [2019]
- Learning Java. Patrick Niemeyer and Daniel Leuck. O'Reilly, 2013.
- Java 8 Lambdas : functional programming for the masses. Richard Warburton et. al. O'Reilly, 2014.
- <https://docs.oracle.com/en/java/javase/24/docs/api/index.html>
- <https://docs.oracle.com/en/java/javase/24/>