COURSE DATA

DATA SUBJECT

Code: 34796
Name: Computer Programming
Cycle: Undergraduate Studies
ECTS Credits: 6
Academic year: 2025-26

STUDY (S)

Degree	Center	Acad. year	Period
1402 - Degree in Telecommunications Electronic Engineering	Escola Tècnica Superior d'Enginyeria	2	Second quarter

SUBJECT-MATTER

Degree	Subject-matter	Character
1402 - Degree in Telecommunications Electronic Engineering	Programming	COMPULSORY

COORDINATION

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SUMMARY

Programming has 6 ECTS, is taught in the second semester of the second course in Telecommunication Electronics Engineering Degree. Its purpose is to give students an introduction to the Java programming language and provide a broad view of different APIs for the development of network and distributed applications. After completing the course students should be able to develop applications using networked and properly distributed object-oriented, parameterized types, class hierarchies, concurrency and synchronization of concurrent tasks.

The general objectives are listed below:

- Develop applications using object-oriented concepts.
- Declaring and using appropriate class hierarchies, abstract classes, interfaces and parameterized types.
- Develop applications that use concurrency and shared resources to synchronize tasks using semaphores or monitors.
- Create input and output streams given some specifications.
- Develop networked applications using different protocols.
- Use integrated development environments for development, debugging and execution

applications.
- Use appropriate tools to compile and run applications.

PREVIOUS KNOWLEDGE

RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE

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

OTHER REQUIREMENTS

To a proper understanding of the subject matter it is recommended to have the background given in an introductory course in programming, as the provided in the subject Informatica.

COMPETENCES / LEARNING OUTCOMES

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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.

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

DESCRIPTION OF CONTENTS

1. Object Oriented Programming

Review of concepts: classes, methods, objects, messages and encapsulation.
Inheritance, class hierarchies, abstract classes, interfaces, polymorphism
Parameterized types: declaration and use. Exceptions: declaration and treatment. Input and output streama. Object serialization

Introduction to concurrent programming.
Models based on message passing. Models based on shared memory.
Concurrent tasks with threads
Problems accessing to shared resources: critical section

2. Concurrent Programming

Introduction to concurrent programming.
Models based on message passing. Models based on shared memory.
Synchronization mechanisms of concurrent tasks: semaphores and monitors

3. Network and distributed programming

Introduction to distributed programming.
Applications based on UDP, TCP and HTTP

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	10,00
Independent study and work	30,00
Preparation of lessons	50,00
Preparation for assessment activities	0,00
Resolution of case studies	0,00
Total hours	**90,00**

TEACHING METHODOLOGY

The methodologies proposed for this subject are:

- Lectures: Development of the themes by providing a global and integrative vision, analyzing in greater detail the key aspects and more complex, encouraging at all times the participation of students. Prior to attending each class, an online test is proposed for the student to review the information to be discussed in class, thus enhancing the participation and solving doubts in the classroom.
- Practical classes in the classroom. They complement the expository lessons in order to apply the basic concepts and expand them with the knowledge and experience that they acquire during the execution of the proposed works.

- Practical classes in the laboratory. Practices will be carried out individually or in small groups in which students will develop theoretical and practical contents through their application in realistic cases using the specific material and under the supervision of the teacher. In each practice, the students will perform an exercise prior to the practice that will be delivered before the practice. This exercise aims to analyze the work to be done in the laboratory, and relate it to the concepts seen in the theoretical classes. Attendance to internships is compulsory and is a non-recoverable activity.
- Autonomous student work. Realization of works, questions, problems outside the classroom, bibliographical searches, as well as the preparation of classes and exams (study). The realization of these activities will sometimes be individual, to empower the student's autonomy, and sometimes in small groups, to enhance the capacity for integration into working groups, as well as leadership and coordination capacity.
- E-learning platform. The e-learning platform (Aula Virtual) of the Universitat de València will be used as a communication support for students, and also for the realization of tests and corrective exercises online. Through it will have access to the didactic material used in class, as well as the problems and solved exercises.

EVALUATION

The evaluation of the course will consider the following dimensions:

• Continuous assessment based on participation and degree of involvement in the teaching-learning process: online tests prior to attending each class, and the regular attendance of activities to solve problems and individual workshops that will be proposed at the e-learning platform (N_Continua) (R2,R3).

• An intermediate individual continuous evaluation exam: midterm exam. It will contain theoretical issues and problems. This test eliminates provided material for the final examination if the score is equal to or greater than five, and the midterm exam's score will average with the final exam's score (Nproves) (R7).

• Evaluation of activities in the laboratory. Occasionally you may make oral presentations (individually and / or group) to evaluate the writing and presentation skills (N_Practicas). To evaluate the grade of each session, previous work will score 35% and development practice 65% (R7).

Final Score= 10% N_Continua + 60% (N_Pruebas) + 30% N_Practicas

All the individual exams' score (midterm and the final one) will be equal or greater than 4 to calculate the final score. Likewise, the final exam has two parts, one corresponding to the midterm and the remaining part, and in both parts, a minimum score of 4 is required to average.

In the second call, there will be a test for theory / problems /laboratory. The final score in the second call will be obtained by the same proposal at the first call or for the alternative assessment:

• Alternative assessment to the continuous assessment. At this assessment, the Final exam will contain both individual theoretical and practical issues and problems (N_Examen).

Nota Score = 70% (NExamen) + 30% NPracticas

The N_Pruebas score will be greater than or equal than 4.

"In any case, the evaluation system will be governed by the one establishes in the Regulation of Evaluation and Qualification of the University of Valencia for Degrees and Masters https://webges.uv.es/uvTaeWeb/MuestraInformacionEdictoPublicoFrontAction.do?accion=inicio&idEdictoSeleccionado=5639)".

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. Cómo Programar. P. J. Deitel y H. M. Deitel. Pearson Educación, Séptima edición, 2008
- Core Java 2. Volumen I. Cay S. Horstmann ; Gary Cornell, Prentice Hall, séptima edición, 2005
- Java Network Programming and Distributed Computing. David Reilly, Michael Reilly. Addison-Wesley
- Core Java 2. Volumen II. Cay S. Horstmann ; Gary Cornell, Prentice Hall, séptima edición, 2006