

**COURSE DATA****Data Subject**

Code	34888
Name	Computer Programming
Cycle	Grade
ECTS Credits	6.0
Academic year	2021 - 2022

Study (s)

Degree	Center	Acad. year	Period
1403 - Degree in Telematics Engineering	School of Engineering	3	First term

Subject-matter

Degree	Subject-matter	Character
1403 - Degree in Telematics Engineering	12 - Programming	Obligatory

Coordination

Name	Department
GUTIERREZ AGUADO, JUAN	240 - Computer Science

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 "Amplificación 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 .

OUTCOMES

1403 - Degree in Telematics Engineering

- R1 - Ability for self-learning of new knowledge and techniques appropriate for the conception, development and exploitation of telecommunications systems and services.
- 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.
- 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.
- E6 - Ability to design networks and telematic services architectures.
- E7 - Ability to programme networked and distributed telematic services and applications.

LEARNING OUTCOMES

This course allows for the following learning outcomes or skills:

1. To program applications using appropriately the object oriented approach (G3, G4, R1).
2. To declare and use class hierarchies, abstract classes, interfaces and parametrized types (G3, G4, R1).
3. Develop applications that use concurrency and shared resources that synchronize the tasks (G3, G4, R1, E7).
4. Construct input/output streams to meet some specification. Use object serialization (G3, G4, R1).
5. Use integrated development editors to develop, debug and execute applications (G3, G4, R1).



6. Use the tools to compile and execute applications (G3, G4, R1).
7. Find and interpret the information in the Java API (G3, G4, R1).
8. Develop network applications using UDP (G3, G4, R1, R7, E6, E7)
9. Develop network applications using TCP (G3, G4, R1, R7, E6, E7)
10. Develop network applications using HTTP (G3, G4, R1, R7, E6, E7)
11. Develop distributed applications using the distributed object middleware RMI and to explain what is the function of each element (G3, G4, R1, R7, E6, E7).
12. Develop distributed applications using properly the studied elements: concurrency, input/output/serialization, protocols, etc. in new contexts (G3, G4, R1, R7, E6, E7).

DESCRIPTION OF CONTENTS

1. Object orientation in Java

Background: classes, methods, objects, messages and .
References and primitive types.
Inheritance, type hierarchy, abstract classes, interfaces and polymorphism
Parametrized types
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

ACTIVITY	Hours	% To be attended
Theory classes	30,00	100
Laboratory practices	20,00	100
Classroom practices	10,00	100
Study and independent work	20,00	0
Readings supplementary material	10,00	0
Preparation of evaluation activities	18,00	0
Preparing lectures	10,00	0
Preparation of practical classes and problem	30,00	0
Resolution of online questionnaires	2,00	0
TOTAL	150,00	

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 note is made up of a theory part and a practice part.

The Theory note (N_t) takes into account:

- Questionnaires conducted in Virtual Classroom (20%)
- Two bulletins (10%)
- Two evaluation tests (70%)



One of the tests will take place in the middle of the semester and another on the date set by ETSE for the first call. These tests will contain theory questions, questions similar to those made in the bulletins and can cover contents made in the laboratories.

The practice note (N_p) takes into account:

- Questionnaires to be delivered at the end of the laboratory session (75%)
- Academic work on one of the practices (25%)

FINAL NOTE:

If the note N_p and the note N_l are greater than or equal to 4, the weighted average will be performed:

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

Otherwise, the subject will be suspended on first call.

The note N_t is recoverable however the note N_p is not recoverable for the second call.

N_T evaluate the following skills: G3, G4, R7, E6 and E7

N_P evaluates the following skills: G3, G4, R1, R7, E6 and E7

SECOND CALL

On the date established by the ETSE for the second call, there will be an examination that It will contain theoretical aspects, questions and practical aspects.

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

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

where

N_e = Exam Note

N_p = Practice Note

N_E evaluates the following skills: G3, G4, R7, E6 and E7

In any case, the evaluation system will be governed by the provisions of the Evaluation Regulation and Qualification of the University of Valencia for Degrees and Masters.

REFERENCES



Basic

- Java, cómo programar. Deitel y Deitel. 9 ed. 2012. Pearson Educación
- Core Java, Volume I--Fundamentals, Cay S. Horstmann, Gary Cornell, 8 ed, 2008, Prentice Hall
- Core Java, Volume II--Advanced Features, Cay S. Horstmann, Gary Cornell, 8th ed, 2008, Prentice Hall
- Java Network Programming and Distributed Computing, David Reilly, Michael Reilly, Addison Wesley, 2002
- API de Java: <http://docs.oracle.com/javase/7/docs/api/>

Additional

- C1 Documentación: <http://docs.oracle.com/javase/8/docs/>

ADDENDUM COVID-19

This addendum will only be activated if the health situation requires so and with the prior agreement of the Governing Council

If it is required by the sanitary situation, the Academic Committee of the Degree will approve the Teaching Model of the Degree and its adaption to each subject, establishing the specific conditions in which it will be developed, taking into account the actual enrolment data and the space availability.

In case of a closure of the facilities due to the health situation that affects all or part of the classes of the subject, these will be replaced by non-presential sessions following the established schedules. If the closure affects a course evaluation test, it will be replaced by a test of a similar nature that will be carried out in virtual mode through the University of Valencia's institutional support tools. The percentages of each evaluation test will remain unchanged, as established by this guide.

In the event that the circumstances for COVID-19 force us to continue online, the bulletins and tests will be preformed using the Virtual Classroom.

Theory classes will be carried out synchronously using Teams combining: videos, exercises, workshops, questionnaires, etc.

The laboratory classes will be carried out synchronously using Teams and the questionnaires of the laboratory sessions will be delivered using the Virtual Classroom.

This addendum will only be activated if the health situation requires it and with the prior agreement of the Governing Council.