



Universidad de Jaén

School of Engineering of Linares

Mobile services

2024-2025

Grado en Ingeniería Telemática

Doble Grado en Ingeniería de Tecnologías de Telecomunicación e Ingeniería de Telemática



GRATIA

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Syllabus 2024-25 - 14513010 - Mobile Services (Servicios móviles)

Caption

- Level 1: Tutorial support sessions, materials and exams in this language
- Level 2: Tutorial support sessions, materials, exams and seminars in this language
- Level 3: Tutorial support sessions, materials, exams, seminars and regular lectures in this language

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DEGREE:

Grado en Ingeniería telemática (14513010)

FACULTY:

SCHOOL OF ENGINEERING OF LINARES

DEGREE:

Doble Grado Ing. de tecnologías de la telecomunicación e Ing. telemática (15213004)

FACULTY:

SCHOOL OF ENGINEERING OF LINARES

ACADEMIC YEAR:

2024-25

COURSE:

Mobile Services

SYLLABUS

1. COURSE BASIC INFORMATION

NAME: Mobile Services

CODE: 14513010 (*)

ACADEMIC YEAR: 2024-25

LANGUAGE: English

LEVEL: 2

ECTS CREDITS: 6.0

YEAR: 4

SEMESTER: PC

2. LECTURER BASIC INFORMATION

NAME: MUÑOZ MONTORO, ANTONIO JESUS

DEPARTMENT: U134 - INGENIERÍA DE TELECOMUNICACIÓN

FIELD OF STUDY: 560 - INGENIERÍA TELEMÁTICA

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ORCID: -

LANGUAGE: English

LEVEL: 2

3. CONTENT DESCRIPTION

Theoretical Contents

This subject studies the most important technologies for the development, deployment and integration of communication protocols and services used in mobile devices and terminals, as well as within the framework of the Internet of Things.

In addition, the student will be provided with the ability to keep up to date with the latest in science and technology, especially in this type of subject, so closely linked to such a dynamic environment as telecommunications.

The theoretical block program is made up of four topics, with the structure that appears below.

1. Introduction to mobile services and applications.

Goals: Know the origins and most significant characteristics of Android. Minimum terminal requirements to run Android. Know the different versions of Android. Know the information available from Android. Know the different methods to store data persistently in Android. Know the problem of physical storage in Android. Know the use of databases in Android. Know the details of the Android user interface classes. Design user interfaces using XML or implement executable code. Handle events generated by the user interface. Create user menus. Know the principles of the dynamic design of user interfaces based on Fragments. Index:

- Introduction to mobile services
- Introduction to Android
- Activities
- Android data storage

2. Wireless communication technologies for mobile terminals.

Goals: Know the details of the management classes of wireless communication interfaces with Android. Know how to activate and use these communication interfaces with Android. Know the problems of communications with Android. Index:

- Bluetooth
- Wifi
- GPS
- NFC

3. Design and management of access to remote services.

Goals: Know the types of processes involved in an Android application. Know the details of the classes of communications through the Internet and IP networks with Android. Sockets. http. Know the problems of communications with Android. Index:

- Processes and tasks
- Handlers-Message handlers
- Asynchronous tasks
- Communications with Android
- Android Communications Packs
- Application permissions for communication access
- HTTP clients on Android

4. Components and fundamentals of React Native.

Goals: Build native applications with the React Native framework. Understand the fundamentals of React Native and its main components. Index:

- Contents.
- Introduction.
- Facility.
- Starting a new project.
- Development and tests.
- Final version.
- Components.
- Fundamentals.

Practical Contents

The practical block of the subject consists of laboratory practices, and its nature is mandatory.

The fundamental objective of the practices is the achievement of the skills and competences necessary for the design, implementation and testing of communications applications for mobile terminals. The set of activities carried out in the practices will correspond to a design project and implementation of an application for a mobile device that allows access to a remote service through the Internet.

In addition, communication skills for information, ideas, problems and solutions in the field of engineering and society in general will be developed through documentation delivery processes for practical activities, as well as oral presentations.

Regarding the organization of work, collaboration and teamwork will be encouraged through the design of the practices themselves, as well as the use of project management platforms used in professional environments.

Activity 1. Running applications.

The objective of this activity is to run an Android application in different environments, such as: an AVD (Android Virtual Device) simulator and debugging on a physical device via USB cable.

Activity 2. Communication between activities.

The goal of this activity is to create a Java-based Android application.

Activity 3. Interface design I.

The objective of this activity is to practice with different layouts and basic controls for interface design

Activity 4. Interface design II.

The objective of this activity is to practice with different basic controls for interface design, such as: RadioButton, RadioGroup, CheckBox, Spinner and ListView.

Activity 5. Menus and file-based storage.

The objectives of this activity are: to practice with the menus (which provide a simple interface for the user to access the different functions of the applications) and to make an approach to the use of files as a solution for the data storage of an application.

Activity 6. Storage in databases: SQLite.

The objective of this activity is to make an approach to the use of databases as a solution for the data storage of an application.

Activity 7. Location information (GPS).

The objective of this activity is to obtain geolocation information using the mobile device.

Activity 8. Google Play services: maps.

The goal is to use an activity to present geographic data using Google maps and make use of some of the Google Play Services. It is a library created by Google by which developers can easily take advantage of Google APIs and services.

Activity 9. Bluetooth.

The goal of this activity is to use a mobile device's Bluetooth device to receive data from a sensor device. To carry out this task, an ESP32 microcontroller (WIFI + Bluetooth) will be used.

Activity 10. Access to remote services.

The goal of this activity is to create an Android app that makes use of the Firebase cloud platform to retrieve stored data in real time. In this example, the data is sent by an ESP32 device, and we assume that it comes from sensors connected to it.

Activity 11. Application development with React Native.

The goal of this activity is to learn about a set of tools and services built around React Native that help you quickly develop, build, and deploy to iOS, Android, and web apps using the same code.

Activity 12. React Native, main components.

The goal of this activity is to learn about a set of core React Native components. We can find them on the web: <https://reactnative.dev/docs/components-and-apis>

Activity 13. React Native. Access to remote services.

The goal of this activity is to learn how HTTP can be used to communicate with remote services using a React Native application.

Activity 14. React Native. native components.

The goal of this activity is to create a native component and add it to an application. It starts from a project created with Expo React Native and describes the necessary steps to integrate the new components.

Activity 15. How to publish your app in the Play Store.

The objective is to know the steps to publish an Android application in the Google Play Store.

Seminars

- Android mobile application and service development systems.
- Version control software.

4. COURSE DESCRIPTION AND TEACHING METHODOLOGY

The development of expository classes in large groups, as well as in small groups, will be focused on promoting quality teaching, prioritizing activities that promote inclusive and equitable learning (SDG-4).

Expositive classes in large group

The methodology to be followed in the large group expository classes will be a mixture of introductory activities, master classes and the presentation of theory and general examples in the classroom designated for the subject by the center. In addition to exposing the theoretical contents of the subject, the ability to collect and interpret data and manage complex concepts within Telematics Engineering will be developed and enhanced, in order to make judgments that imply reflection on ethical and social issues.

The student must follow the teacher's presentation with the material delivered for this purpose, whether they are notes or a slide presentation, which must be completed with their own notes and with the subsequent review of the basic and/or recommended bibliography.

Attendance, as well as active, respectful and responsible participation, either to raise doubts or to respond to the teacher's requirements or questions, will be evaluated positively in its corresponding factor.

The student's autonomous work should focus on reviewing the concepts and theoretical aspects seen in class, carrying out exercises, as well as studying them with the material provided by the teacher, student notes and bibliography.

Small group classes

The small group classes will be implemented through work sessions in the laboratory that will focus on the development of the applications, or learning tasks designated by the teacher, which culminate with the completion of the client or server applications, the objective of the practice, which will follow, throughout the course, a project-based learning methodology.

Thus, during the practical sessions, the work of design and implementation of the applications marked by the different practices must be carried out, in order to be able to count on the supervision of the teacher. In addition, work in a collaborative environment will be encouraged, as well as mixing with the communication of results

Attendance, as well as active, respectful and responsible participation, either to raise doubts or to respond to the teacher's requirements or questions, will be evaluated positively in its corresponding factor.

Regarding the autonomous work, it will focus on the preparation of the documentation to be delivered for each practice, as well as on completing the work started in the laboratory and that could not be finished in the corresponding session. Special emphasis will be placed on the need for their own continuous training and to undertake this activity independently throughout their professional life, as well as on the ability to keep up to date with the latest in science and technology, especially in this type of field. of subjects, so linked to an environment as dynamic as telecommunications, and specifically Telematics Engineering.

In addition, work in a collaborative environment will be encouraged, as well as the mix with the communication of results, with special emphasis on the need for continuous training typical of activities related to telecommunications throughout their professional life independently.

Collective tutorials

The collective tutorials will be used in the resolution of doubts, monitoring and supervision of the work and exercises, as well as in the attendance and participation in the different seminars planned in the subject, as well as talks, conferences, workshops and/or conferences, designated by the teacher, in order to complete and update the training and obtain general, transversal and/or specific competences defined for this activity, such as the value of continuous training, entrepreneurship or the review of technological innovations in the matter.

The attendance, as well as the active, respectful and responsible participation, in the aforementioned activities, will be evaluated according to the provisions of the evaluation system of this guide.

Students with special educational needs should contact the Student Attention Service (Servicio de Atención y Ayudas al Estudiante) in order to receive the appropriate academic support

5. ASSESSMENT METHODOLOGY

At the end of the semester, the student body will be able to choose between two evaluation modalities: CONTINUOUS or SINGLE TEST.

Continuous assessment

In the modality of continuous evaluation, this will be carried out according to the activities planned in the teaching guide for the subject and described in the Methodology and activities section, in addition to those described in the Detailed Description of Continuous Evaluation section, following the weights of each aspect, detailed in the previous table.

To pass the subject, the student body must obtain a grade equal to or greater than 5.0 out of 10 in the total calculation of the evaluated aspects, as long as a grade equal to or greater than 4.0 has been obtained in each of said aspects. . In the case of not having obtained a grade equal to or greater than 5.0 out of 10 in the total calculation, or equal to or greater than 4.0 in any of the evaluated aspects, to pass the subject it is mandatory to opt for the evaluation with Single test.

Single test

In the SINGLE TEST modality, an exam will be carried out on the day set for the subject within the exam period, which will cover all the contents of the subject, ensuring that the student body has acquired the skills and learning outcomes established for the exam. same. The weight that will be assigned to each of its two parts will be the following:

- Part 1. Attendance and participation, theoretical concepts of the subject and completion of work, cases or exercises (S1, S2 and S3): 70%.
- Part 2. Laboratory/computer practices (S4): 30%.

The specific conditions, as well as the material and/or documentation that may be used in the Single Test will be those established by the person in charge of the subject.

To pass the subject, the student body must obtain a grade equal to or greater than 5.0 out of 10 in each of the two parts of this test.

Students who have passed aspect S4 of laboratory/computer practices of the subject through CONTINUOUS assessment, with a grade equal to or greater than 5.0 out of 10, will not have to take Part 2 corresponding to this aspect in the exam, applying the same qualification obtained in the CONTINUOUS evaluation of said part.

The parts passed in each call will be kept until the end of the course.

Detailed description of the Continuous Assessment

For those students whose evaluation is carried out continuously, it will be based on monitoring and carrying out the activities included in the four categories presented in the

Assessment System, which make up the total evaluable elements of the subject:

- S1, Attendance and participation, 10%.
- S2, Theoretical concepts of matter, 30%.
- S3, Carrying out work, cases or exercises, 30%.
- S4, Laboratory/computer practices, 30%.

Each of these blocks will be detailed in the following sections.

S1 - Attendance and participation (10%)

In this section the competences will be evaluated: CG3, CG4, CG6 and CG9.

The positive evaluation of this section will mean that the student has achieved the following skills or learning outcomes: result 27, result 30, result 34 and result 35.

Attendance

Attendance will be valued at a maximum of 5% of the total for the subject and will be evaluated in the set of the three categories already mentioned in the methodology: large group lectures, small group classes and collective tutorials. At the beginning, each student will have the total score, this being reduced when some of the following situations occur:

Each unexcused absence from any of the classes or tutorials will result in a reduction of 0.25% of the total 5%.

Failure to attend lectures in large groups for a number of times greater than 50% of them will lead to the total loss of the Attendance score.

Failure to attend classes in small groups for a number of times greater than 50% of them will lead to the total loss of the Attendance score.

The assessment of the qualification in attendance is subject to obtaining a score greater than 0% in Participation.

Stake

In relation to the participation, which will be valued at a maximum of 5%, it will be evaluated taking into account the following elements:

The disposition of the student to answer or solve those questions that the teacher formulates during the expository classes in a large group or in a small group, either in general or individually. Its valuation will be up to a maximum of 1.5%.

The activity of the students in the resolution of the self-training activities proposed in the expositive classes and/or group tutorials, such as collaboration in problem solving. Its valuation will be up to a maximum of 1.5%.

Collaboration in maintaining a good working environment in the classroom and the laboratory will lead to a grade of 2.0% at the end of the academic period. Obstructing class work, either by the teacher or by classmates, will lead to a penalty that can range from 1% to 5% of the participation grade (the participation grade can never be less than 0%).

S2- Theoretical concepts of matter (30%)

In this section, the competencies CG3, CG4, CG6, CG9, CC7, TEL7 and IOT2 will be evaluated

The positive evaluation of this section will mean that the student has achieved the following skills or learning outcomes: result 27, result 30, result 34, result 35, result 10 and R.03.

The evaluation of the theoretical concepts will be carried out through assessment tests resolved through the virtual teaching platform, or by solving questions raised in class by the teacher.

Both types of test are intended to demonstrate that the student has assimilated the knowledge taught in the subject.

Theory assessment tests

These tests will be individual and to be carried out through the virtual teaching platform. Its format and content will be communicated to the students before it is carried out, and may be adapted to the progress of the subject, agenda, classroom availability, etc. At least two tests will be planned during the school period, these being evaluated separately and in which the student can obtain a grade between 0 and 10 points. The weight of each test in the final evaluation will be the same.

The score to be obtained will be between 0 and 10, correspondingly extrapolated to the range between 0% and 30%, this resulting value coinciding with the total assessment of the theoretical concepts section of the subject.

S3 - Carrying out work, cases or exercises (30%)

In this section, the competencies CG3, CG4, CG6, CG9, CC7, TEL7 and IOT2 will be evaluated

The positive evaluation of this section will mean that the student has achieved the following skills or learning outcomes: result 27, result 30, result 34, result 35, result 10 and R.03.

Each individual student or pair of students (as long as they are the same members of the practice pairs), will have to deliver one or several exercises that will be proposed by the teacher. The exercises may be different for each student or pair, trying to make the complexity similar between them.

These exercises will be delivered.

They will be in electronic format through the virtual teaching platform before the problem session of the corresponding topic.

In each exercise the following aspects will be assessed:

- Mastery of operational knowledge of the subject.
- Structure in the approach of the problem and its resolution.
- Resolution: type of solution, justification and correction.
- Originality: no exercise will be valued whose resolution has been used in the same way or in a very similar way in another course, in class or by other students.
- Spelling, format and presentation.

Each exercise will be evaluated from 0 to 10 and the total score will be the arithmetic mean of all of them, which will be extrapolated to the range between 0% and 30%.

S4 - Laboratory/computer practices (30%)

In this section, the competencies CG3, CG4, CG6, CG9, CC7, TEL7 and IOT2 will be evaluated

The positive evaluation of this section will mean that the student has achieved the following skills or learning outcomes: result 27, result 30, result 34, result 35, result 10 and R.03.

The practices will be mandatory for the student (which does not necessarily imply attendance, which is valued in another of the evaluable elements of the subject).

The practices can be done individually or in pairs (preferably). Doing it in pairs does not necessarily entail the achievement of the same grade by both students.

The criteria that will be followed for the evaluation of the internship work will be the following:

- Attitude and effort shown throughout the work.
- Application of specific knowledge to practice.
- Analysis/synthesis capacity.
- Ability to draw conclusions.
- Overall quality of work.
- Technical rigor.
- Operation, realization and documentation of codes and programs.
- Presentation, organization, grammatical correction, spelling and cleanliness in reports and papers.

To obtain the evaluation of each practice, the following requirements must be met:

The teacher's approval of the work done. A practice that does not have the approval of the teacher will not be evaluated, and its score will be 0.

The delivery of all the material required in the practice: the delivery of the material required in each practice outside the stipulated deadlines may lead to the non-evaluation of the same or a penalty in the qualification of up to 5 points. The works not delivered will have a grade of 0.

Achievement of all the functional objectives of the practice.
Respond correctly to the questions raised by the teacher about the practice.

Carry out all the modifications proposed by the teacher to verify that the appropriate skills have been acquired, the object of the practice.

Failure to meet any of these requirements will lead to a decrease in the qualification of the practice, which will be evaluated from 0 to 10.

The total evaluation of section S4 will be the result of the average of the qualifications of each practice.

The final score to be obtained will be between 0 and 10, correspondingly extrapolated to the range between 0% and 30%, this resulting value coinciding with the total assessment of the practices section.

6. BOOKLIST ([Access the bibliography in the Library catalog](#))

MAIN BOOKLIST:

- Wireless Communication Networks and Systems. Edition: 1ª. Author: Cory Beard y William Stallings. Publisher: Pearson.
- **Notes:** Tema 3. Prácticas 7, 8, 9, 10

(Library)

7. SUSTAINABLE DEVELOPMENT GOALS

Educación de calidad

Industria, innovación e infraestructura

Producción y consumo responsables

DETAILED INFORMATION**Goal 4. Quality education**

Throughout all the activities of the subject, fundamental aspects in relation to inclusion and equity will be addressed, which will also be part of the evaluation of the participation aspects. Thus, it will be promoted, both in large group expository classes, as well as in small groups, to use inclusive language both at the written and oral level and to attend to activities of various kinds focused on being equitable with the different learning capacities of the student.

Furthermore, on the one hand, in large group classes the ability to collect and interpret data and handle complex concepts in the field of telecommunications will be developed and enhanced, to make judgments that involve reflection on ethical and social issues. On the other hand, in small group classes special emphasis will be placed on the need for continuous training and undertaking this activity independently throughout one's professional life, as well as the ability to stay up to date with new developments. in the field of telecommunications, taking a more technical approach.

Goal 9: Build resilient infrastructure, promote sustainable industrialization and foster innovation

Through the activities of this subject in large and small group classes, special emphasis is placed on the fact that telecommunication systems and services must be developed, implemented and maintained in a way that achieves resilient and robust industrialization, as well as as sustainable.

Furthermore, both with the training of content, abilities, skills and abilities, and with the development of the activities proposed to the students, personal initiative and the ability to solve problems autonomously are promoted in order to encourage innovation as a driving force for industrial development, especially in the field of telecommunications, as well as a wealth-generating element of a society.

Goal 12: Ensure sustainable consumption and production patterns

In this subject, through the activities designed for large and small group classes, we will seek to raise awareness among students about the reasonable use of resources, given that telecommunication services are generally very demanding in energy and raw materials, and likewise in the search for greater durability of products and services, pursuing a longer-term use of the resources used. Therefore, emphasis will be placed on achieving robust, efficient, long-lasting services and/or products with the lowest possible environmental impact, always taking into account the techniques that facilitate this, such as the correct specification of needs, designs that use new, clean and advanced technologies, carrying out tests and using, as far as possible, renewable energies.

8. VIRTUAL / CLASSROOM TEACHING SCENARIO

The schedule may be modified, especially in the change between this scenario and the multimodal one, in order to adapt to said changes.

Evaluation system

There are no changes in the evaluation format (weights of each section) or in what is specified in the detailed evaluation.

Since the evaluation of the subject is continuous, there will only be an exam in the event that the student opts for the Single Test Evaluation

Resources

Given that attendance at the Expository Classes in a large group and in the Practice Group Classes is 100%, no exceptional resources are foreseen for them.

9. VIRTUAL TEACHING SCENARIO

Non presential lectures

Evaluation system

There are no changes in the evaluation format (weights of each section) or in what is specified in the detailed evaluation.

Since the evaluation of the subject is continuous, there will only be an exam in the event that the student opts for the Single Test Evaluation

Resources

Given that attendance at the Expository Classes in a large group and in the Practice Group Classes is 100%, no exceptional resources are foreseen for them.

DATA PROTECTION CLAUSE (on line exams)

Institution in charge of data processing: Universidad de Jaén, Campus Las Lagunillas, s/n, 23071 Jaén

Data Protection Delegate: dpo@ujaen.es

Purpose: In accordance with the Universities Law and other national and regional regulations in force, carrying out exams and assessment tests corresponding to the courses students are registered in. In order to avoid frauds while sitting the exam, the exam will be answered using a videoconference system, being able the academic staff of the University of Jaén to compare and contrast the image of the person who is answering the exam with the student's photographic files. Likewise, in order to provide the exam with evidential content for revisions or claims, in accordance with current regulation frameworks, the exam will be recorded and stored.

Legitimacy: compliance with legal obligations (Universities Law) and other national and regional regulations currently in force.

Addressees: service providers who are the owners of the platforms where the exams are carried out and with whom the University of Jaén has signed the corresponding data access contracts.

Storage periods: those established in current in force regulations. In the specific case of exam videoconference recordings, not before the examination records and transcripts are closed or the exam can still be reviewed or challenged.

Rights: you can exercise your right of access, amendment, cancellation, opposition, suppression, limitation and portability by sending a letter to the postal or electronic address indicated above. In the event that you consider that your rights have been violated, you may submit a complaint to the Andalusian Council for Transparency and Data Protection www.ctpdandalucia.es

CLASS RECORDING CLAUSE PERSONAL DATA PROTECTION

Person in charge: Universidad de Jaén, Paraje Las Lagunillas, s/n; Tel.953 212121; www.ujaen.es

Data protection delegate (DPO): TELEFÓNICA, S.A.U. ; Email: dpo@ujaen.es

Procedure aim: To manage proper recordings of teaching sessions with the aim of facilitating learning process under a multimodal and/or online teaching

Period for record storage: Images will be kept during legal term according to regulations in force

Legitimacy: Data will be managed according to legal regulations (Organic Law 6/2001, December 21, on Universities) and given consent provided by selecting corresponding box in legal admission documents

Data recipients (transfers or assignments): Any person allowed to get access to every teaching modality

Rights: You may exercise your rights of access, rectification, cancellation, portability, limitation of processing, deletion or, where appropriate, opposition. To exercise these rights, you must submit a written request to the Information, Registration and Electronic Administration Service of the University of Jaen at the address above, or by e-mail to the address above. You must specify which of these rights you are requesting to be satisfied and, at the same time, you must attach a photocopy of your ID card or equivalent identification document. In case you act through a representative, legal or voluntary, you must also provide a document that proves this representation and identification. Likewise, if you consider that your right to personal data protection has been violated, you may file a complaint with the Andalusian Data Protection and Transparency Council www.ctpdandalucia.es

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