COURSE DATA

DATA SUBJECT

Code: 35076
Name: Transmissions, Image and Sound
Cycle: Undergraduate Studies
ECTS Credits: 6
Academic year: 2025-26

STUDY (S)

Degree	Center	Acad. year	Period
1302 - Degree in Criminology	Facultat de Dret	2	Second quarter
1923 - Double Degree Programme Law-Criminology	Facultat de Dret	3	Second quarter

SUBJECT-MATTER

Degree	Subject-matter	Character
1302 - Degree in Criminology	Forensic techniques	COMPULSORY
1923 - Double Degree Programme Law-Criminology	Year 3 compulsory subjects	COMPULSORY

COORDINATION

MORENO CLARI PALOMA MARÍA

SUMMARY

The subject Transmissions, image and sound is a subject of basic and compulsory training, corresponding to the second year of the Degree in Criminology, with a load of 6 ECTS credits.
It is composed of two different treatment parts. The specific technological part will be: fundamentals of digital audio, digital image / video and mainly its transmission through the network. In addition, legal aspects related to communications, ICT, video surveillance and data protection will be discussed.
In the section on transmissions, network and security fundamentals will be explained, as well as some of the multimedia information transmission protocols currently used.
In the part of legal aspects the probative importance of the treatment of data, images, communications, etc. is especially analyzed. The digital support, images and personal data are examined from the legal and fundamental rights perspective. Police files and criminal interest are studied. The treatment of video surveillance, web pages and social networks is also analyzed.
The main objective of the subject is that students acquire knowledge in the field of information and communication technologies, their application in the criminal field and the legal context in which they are framed.

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PREVIOUS KNOWLEDGE

RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE

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

OTHER REQUIREMENTS

No previous knowledge is specified to take this subject.

COMPETENCES / LEARNING OUTCOMES

1302 - Degree in Criminology

Conocer las utilidades y funciones de los distintos sistemas de telecomunicación y saber aplicarlas. G: 1,9 y E: 11, 12

Detectar un uso ilegal de los sistemas de telecomunicación o de grabación y almacenamiento de imagen y sonido. G: 1 y E:11, 12

Saber discernir la adecuación de solicitar determinadas pruebas forenses. G:1,9 y E: 4, 12,22

DESCRIPTION OF CONTENTS

Introduction; Basic concepts. Types of signals. Classification of telecommunication systems.
Propagation of Electromagnetic Waves. Modulation. Mobile communications
Reference models in networks. Typologies of networks; IP addressing (classes of networks in IPv4);
Network hardware and software

Layer model (OSI); Physical layer; Link layer; MAC sublayer; Network layer; Transport layer (TCP / UDP); Application layer

Introduction. Streaming Audio / Video on the Internet. Video conference Unicast transmissions.
Multicast transmissions RTP and PSTN protocols. Protocols H.323, SIP in videoconference.

Cryptography; Security algorithms; Digital signature; Certificates; Security in communication (Ipsec, Firewall, VPN, wifi security, mobile phone security)

1. Introduction to telecommunications and networks (Basic concepts)

Introduction; Basic concepts. Types of signals. Classification of telecommunication systems. Propagation of Electromagnetic Waves. Modulation. Mobile communications

2. Communication between systems

3. Multimedia transmission in IP networks

Introduction. Streaming Audio / Video on the Internet. Video conference Unicast transmissions.

4. Fundamentals of computer security in networks

5. Principis bàsics d'imatge i so digital i psychoacoustics.

Introduction; eye, image formation, capture, sampling and quantization, color models (RGB, CMYK) image formats (JPEG, TIF, PNG, GIF), Mathematical Foundations for analysis (histogram, space operations, transformations, probabilistic methods).

6. LEGAL ASPECTS (Dept. of Constitutional Law)

20 hours
Topic 1
Introduction: Technologies, Law and fundamental rights. Legal apprehension of the image, voice, sound, DNA, personal data, traffic data, communication signals, etc. The special probative value in the criminal field.

Topic 2
Regulation of the electronic document and the test in digital format (LEC, LECRIM, etc.). Specialized bodies of the FCS.

Theme 3
Privacy and own image in the police action and private security. LECRIM, Law 1/1982

Theme 4
Protection of personal data in police action and private security. LECRIM, Law 1/1982, LOPD.

Topic 5
Police files. Communication of information to the FCS, judges and prosecutor. Legal treatment. Biometric, genetic identifiers, etc. LO 10/2007, of October 8, regulating the police database on identifiers obtained from DNA.

Topic 6
Public and private video surveillance ORGANIC LAW 4/1997, of August 4 public camcorders; private security legislation and LOPD.

Topic 7
Secrecy and Interception of telephone, postal, telegraphic and internet communications. LECRIM. SITEL system

Topic 8
Regulation and treatment of telecommunications traffic data: Law 25/2007 and Regulation.

Topic 9
Tracking and closing of web pages. LSSICE (Law 34/2002) and other legislation.

Topic 10
Privacy, image and personal data of members of the FCS and private security.

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	Hours
Theoretical and practical classes	60,00
Total hours	**60,00**

NON PRESENCIAL ACTIVITIES

Activity	Hours
Attendance at other activities	6,00
Individual or group project	18,00
Independent study and work	16,00
Preparation of lessons	14,00
Preparation for assessment activities	15,00
Resolution of case studies	6,00
Total hours	**75,00**

TEACHING METHODOLOGY

The methodology of teaching will combine learning activities with theoretical and practical tutoring activities and those which involve the study, evaluation and the overall work both individually and in teams of the students.
The performance of the activities is as follows:
1) Lectures: Teachers will explain the issues through lectures and ensuring the participation of students in the development of the class. Students must prepare lessons from the material which will be facilitated by teachers and as they will indicate in order to promote student-teacher dialogue.
2) Practical classes: Practical classes are based on the development of applications based on the theory and use of the computer as a tool for achieving the objectives in each one of the practices. These are based on guides developed and designed to illustrate simple studies of case which can be found in reality. It will also enhance communication between teacher-student and among students.
3) Works: We will develop small projects or practical work, which may be implemented individually or in groups, to apply the skills and investigate new concepts that may arise.
4) Conferences, seminars, etc: These activities are a complement to the agenda. It could be planned the organization of talks or lectures by experts in the field.
5) Tests and exams

EVALUATION

The course consists of two parts: part legal and part technique. The legal part is weighted by 0.33, and the

technical part with 0.67, i.e. 1/3 of the note shall be for the legal part, and 2/3 will be devoted to the technical aspects. In addition to achieve a minimum of 5 points within the final grade average in the two parts, it is also essential to obtain a minimum of 4 out of 10 in each block to pass the subject.

The final determination of the qualification, in any case is constrained to the overall assessment of the two blocks jointly.

Passing a block of the subject (legal part and technical part) will remain in case it is failed the other block on a first call. Thus, in a second call you can go for the written test of one of the two blocks (the one which is not approved).

Evaluation of the part on technical aspects:

In **technical aspects**, it will be two types of assessment, A and B:

¿ **Mode A:** Continuous assessment.

To qualify for this type of assessment the student must attend at least 80% of classes and deliver at least 80% of the requested activities. In this evaluation modality the following will be scored: - with 10% attendance at classes and conferences and participation in the classroom, - with 20% of the final work, its draft and videopresentation, - and the remaining 80% through an individual test type TEST.Students who do not meet the criteria for evaluation of Type A will qualify for the Assessment with theMethod B.

¿ **Type B:** FINAL EXAM.

Review that will ask about all the concepts, activities and lectures of the course.

In this test the maximum grade that the student will be able to get is 7 out of 10.Depending on the activities and participation throughout the academic year, the teacher can add a point as a maximum.

Evaluation of the part on legal issues:

To assess the degree of acquisition of skills will be used the following instruments:

¿ Continuous assessment: student will be evaluated according to their participation throughout the theoretical, practical and applicative sessions, as well as complementary activities. Included in this concept are works, activities and case studies conducted and required by teachers. It will also be assessed the contribution of students to the course and its development and contents.

¿ Tests of the subject: the subject tests may be theoretical or practical theorist, as determined by the coordinators and teachers of the corresponding block.

- For the accomplishment of the applied and complementary activities, the lecturer of the subject will be able to use the methodology of the Learning-Service

In the first exam period, after the first semester, there will be a written test of the legal (Dept. D º. Constitution).

The qualification in the block of legal aspects will be the result of the written test weighted 70% and continuous assessment score by 30%.

Students who do not have the requirements for continuous assessment, they will be able to pass the course after the final examination. However, in this way, it can only be obtained a maximum score of 7 out of 10. Thus, to achieve a 5 on this block, students will have obtained a minimum score on the examination of a 7.

Teachers and the responsible coordinator may determine that the final written test will be differentiated for students who have followed a continuous course and students who have not done so.

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REFERENCES

- -Andrew S. Tanenbaum; Redes de Computadoras
- OCW Derecho e internet. http://ocw.uv.es/ciencias-sociales-y-juridicas/plant/Course_listing
- OCW Derechos fundamentales. http://ocw.uv.es/ciencias-sociales-y-juridicas/1-5/Course_listing
- LOPD: http://www.agpd.es/portalwebAGPD/canaldocumentacion/publicaciones/common/Guias/GUIA_CIUDADANO_OK.pdf
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- W.Stallings; Fundamentos de seguridad en redes
- J. Watkinson; An introduction to digital video
- L.E. Kinsler; Fundamentos de acústica. Ed. Limusa
- H. Fastl, E. Zwicker; Psycho-acoustics: Facts and models. Springer
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- -R.C.González, R.E.Woods, S.L.Eddins; Digital image processing using MATLAB. Prentice Hall - M.J.Crocker; Handbook of Acoustics. John Wiley & Sons - I.McLoughlin; Applied Speech and Audio Processing with MATLAB Examples. Cambridge