



## Information about the subject

**Degree:** Bachelor of Science Degree in Criminology

**Faculty:** Faculty of Legal, Economic and Social Sciences

**Code:** 1300208 **Name:** Techniques of Forensic Analyses

**Credits:** 6,00 **ECTS Year:** 2 **Semester:** 2

**Module:** Methodology. Scientific-technical.

**Subject Matter:** Forensic Science **Type:** Compulsory

**Field of knowledge:** Other branches

**Department:** -

**Type of learning:** Classroom-based learning

**Languages in which it is taught:** Spanish

**Lecturer/-s:**



## Module organization

### Methodology. Scientific-technical.

Subject Matter	ECTS	Subject	ECTS	Year/semester
Social	6,00	Research Methodology and Techniques in Social Sciences	6,00	1/2
Criminalistics	18,00	Applied Criminalistics	6,00	3/2
		Criminalistics Laboratory. Scientific Police	6,00	2/2
		Documentoscopy and Graphology	6,00	4/1
Forensic Science	24,00	Forensic Psychiatry	6,00	3/1
		Human Anatomy and Physiology	6,00	1/2
		Legal Medicine	6,00	2/1
		Techniques of Forensic Analyses	6,00	2/2

## Recommended knowledge

Not required.



## Learning outcomes

At the end of the course, the student must be able to prove that he/she has acquired the following learning outcomes:

- R1 Acquiring detailed knowledge about the situations that the regulations foresee regarding the different types of death and especially the cases of suspicious and violent death .
- R2 Knowing how to examine injuries caused by different types of weapons.
- R3 The ability to examine the most commonly used registers in human identification, and to interpret the reports in the field of identification and criminalistics.
- R4 Learning the role played in judicial processes by victims, offenders, and finally the role of the professionals involved in these processes: Security Agents, Judges, Magistrates, Prosecutors, Lawyers, Forensic Scientists, experts in the field, etc.
- R5 Knowledge of the general criminal and civil legislation of the Spanish judicial system and the organizational structure of the Spanish and Valencian Community Justice Administration.
- R6 Producing and distinguishing the different medical documents of medical-legal interest and their legal implications.
- R7 Understanding the concepts of medical-legal information systems and their practical applications. Ability to develop forensic record-keeping systems.
- R8 Learning the principles of ethics and professional performance according to the lex artis.
- R9 To highlight the most important applications for the practice of Criminology.



## Competencies

Depending on the learning outcomes, the competencies to which the subject contributes are (please score from 1 to 4, being 4 the highest score):

BASIC		Weighting			
		1	2	3	4
CB1	Showing a command and understanding of knowledge in an area of study that is based on the general secondary education and that is usually at a level that implies the support on advanced textbooks but also the inclusion of knowledge from the cutting edge of their field of study.				X
CB2	Being able to apply their knowledge to their jobs or vocational activities professionally and holding the competences that are demonstrated through the elaboration and defence of arguments as well as the solution of problems within their area of study.			X	
CB3	The ability to gather and interpret relevant data (normally within their area of study) so as to make judgements that include a reflection on relevant social, scientific or ethical issues.				X
CB4	Being able to convey information, ideas, problems and solutions to a specialised or non-specialised public.			X	
CB5	Having developed the learning abilities necessary to pursue postgraduate studies with a high degree of autonomy.				X
GENERAL		Weighting			
		1	2	3	4
CG5	The capacity to obtain and manage efficiently the information from the scientific literature, specialised journals, databases and other sources.				X
CG6	The capacity to establish explanatory hypotheses, using predictive and operative relationships that offer responses to the criminal phenomenon in a criminological context.				X
CG7	The capacity to take decisions and to design programs and strategies for both prevention and treatment of the criminal phenomenon.				X



CG16 Oral and written communication skills in the native language with regards to Criminological Science in order to present, circulate and validate the outcomes of criminological and criminalistic research both through scientific development and through the proposal of specific policies and lines of action.

X

SPECIFIC	Weighting			
	1	2	3	4
CE23 Knowledge and application of scientific research techniques in the medical-legal and criminalistic field, as well as the basis and preparation of various expert reports.				X
CE24 Training in the elaboration of criminologist expert reports as well as in expert intervention in the different phases of the procedures .				X



## Assessment system for the acquisition of competencies and grading system

### In-class teaching

Assessed learning outcomes	Granted percentage	Assessment method
R1, R2, R3, R9	55,00%	Analysis and resolution of case studies.
R1, R2, R3, R9	15,00%	Attendance and participation in class.
R1, R2, R3, R4, R5, R6, R7, R8, R9	30,00%	Exam or objective test to measure obtained competences.

### Observations

Observations Assessment techniques and instruments: tasks, cases, oral presentation of works, laboratory-classroom simulation, written test (objective test of conceptual development through development and short questions), research work, etc ...It is required to achieve a minimum score of 5.0 out of 10 in the objective test to pass the minimum knowledge (equivalent to 30%), so that the percentages obtained from the marks of the practical part (55%) can be applied, as well as the mark obtained for class attendance and participation (15%), and thus obtain the final mark for the course, which must be equal to or greater than 5 out of 10 after the final summation of the three assessment instruments.

The number of "Honors" mentions that can be awarded may not exceed five percent of the students included in the same official record, unless this is less than 20, in which case a single "Honors" may be granted. Honor".

### Online teaching

Assessed learning outcomes	Granted percentage	Assessment method
R1, R2, R3	30,00%	Final test and/or final work
R1, R2, R3	15,00%	Participation in programmed activities
R1, R2, R3	55,00%	Presentation of works and projects

### Observations

Técnicas e instrumentos de evaluación: tareas, casos, exposición oral de trabajos, simulación de laboratorio-aula, prueba escrita (prueba objetiva de desarrollo conceptual mediante preguntas de desarrollo y cortas), trabajo de investigación, etc... Se requiere alcanzar una puntuación mínima



de 5,0 sobre 10 en la prueba objetiva para superarlos conocimientos mínimos (equivale al 30%), para que se puedan aplicar los porcentajes obtenidos de las notas de la parte práctica (55%), así como la nota obtenida por la asistencia y participación en clase (15%), y obtener así, la nota final de la asignatura, que habrá de ser igual o superior a 5 sobre 10 tras el sumatorio final de los tres instrumentos de evaluación.

## MENTION OF DISTINCTION:

According to Article 22 of the Regulations governing the Evaluation and Qualification of UCV Courses, the mention of "Distinction of Honor" may be awarded by the professor responsible for the course to students who have obtained, at least, the qualification of 9 over 10 ("Sobresaliente"). The number of "Distinction of Honor" mentions that may be awarded may not exceed five percent of the number of students included in the same official record, unless this number is lower than 20, in which case only one "Distinction of Honor" may be awarded.

## Learning activities

The following methodologies will be used so that the students can achieve the learning outcomes of the subject:

- M1 Presentation of contents by the teacher, analysis of competencies, explanation and demonstration of abilities, skills and knowledge in the classroom.
- M2 Specific instructions about group and individual assignments for each topic.
- M3 Group work sessions supervised by the teacher. Study of legal cases, both real and fictitious, analysis, diagnosis, problems, field study, computer room, visits, data search, libraries, network, Internet, etc. Significant construction of knowledge through student interaction and activity. Critical analysis on values and social commitment.
- M4 Application of interdisciplinary knowledge.
- M5 Supervised monographic sessions with shared participation
- M6 Personalized attention and in small groups. Period of instruction and/or orientation carried out by a tutor with the objective of reviewing and discussing the materials and topics presented in the classes, seminars, readings, completion of assignments, etc.
- M7 Set of oral and/or written tests used in the initial, formative or summative evaluation of the student.
- M8 Group preparation of readings, assumptions and problem -olving to present, discuss or deliver in class or tutorial.



- M9 Student's study: Individual reading preparation, case studies, jurisprudence. Writings and papers to be presented or delivered in the classes or tutorials.
- M17 Expository Method /Master Class
- M18 Exercise and problem solving
- M19 Case method
- M20 Course works and tasks
- M21 Project-oriented learning
- M22 Guided Practice through debates, resolution of problems and exercises in the virtual classroom.





## IN-CLASS LEARNING

### IN-CLASS LEARNING ACTIVITIES

	LEARNING OUTCOMES	HOURS	ECTS
In-person class M1	R1, R2, R3, R5, R6, R7, R8	15,00	0,60
Practical class M3	R1, R2, R3, R4, R5, R6, R7, R8, R9	30,00	1,20
Seminar M5	R3	2,50	0,10
Group work presentation M4	R4, R9	5,00	0,20
Tutorial M6	R3, R4, R9	5,00	0,20
Evaluation M7	R9	2,50	0,10
<b>TOTAL</b>		<b>60,00</b>	<b>2,40</b>

### LEARNING ACTIVITIES OF AUTONOMOUS WORK

	LEARNING OUTCOMES	HOURS	ECTS
Group work M8	R9	30,00	1,20
Individual work M9	R1, R2, R3, R9	60,00	2,40
<b>TOTAL</b>		<b>90,00</b>	<b>3,60</b>



## ON-LINE LEARNING

### SYNCHRONOUS LEARNING ACTIVITIES

	LEARNING OUTCOMES	HOURS	ECTS
Master Class M17, M19	R1, R2, R3	15,00	0,60
Practical activity M18, M19, M20	R1, R2, R3	25,00	1,00
Tutorial M18	R1, R2, R3	10,00	0,40
<b>TOTAL</b>		<b>50,00</b>	<b>2,00</b>

### ASYNCHRONOUS LEARNING ACTIVITIES

	LEARNING OUTCOMES	HOURS	ECTS
Individual or group work of students M20	R3	90,00	3,60
Activities through virtual resources M19	R3	2,50	0,10
Access and research on complementary contents M18, M19	R3	5,00	0,20
Individual study M17	R3	2,50	0,10
<b>TOTAL</b>		<b>100,00</b>	<b>4,00</b>



## Description of the contents

Description of the necessary contents to acquire the learning outcomes.

Theoretical contents:

Content block

Contents





## Units 1-18

Teaching unit 1. Lesson 1. Sciences and types of forensic laboratories. Legal framework in Spain. Forensic laboratories in Spain. The European Network of Forensic Laboratories (ENFSI). Teaching unit 1. Lesson 2. General organization of the forensic laboratory. Traces and biological and non-biological signs. Personal, quality and homogeneity of analytical skills. Teaching unit 1. Lesson 3. Collection, submission, reception, registration and custody of samples. Chain of custody. Prevention of occupational risks in forensic laboratories. Teaching unit 1. Lesson 4. Specific rules for the submission of samples to the different forensic laboratories for the study of evidence and biological samples. Teaching unit 1. Lesson 5. The expert and analytical expert evidence. The analytical or laboratory expert report. Teaching unit 2. Lesson 6. Macro and microscopic techniques. Fluorescence and phosphorescence (forensic lights). Forensic histopathology. Teaching unit 2. Lesson 7. Qualitative and quantitative analysis techniques (electrophoretic, colorimetric, immunoassays, spectroscopic, chromatographic, X-ray diffraction). Teaching unit 2. Lesson 10. Techniques in Molecular Biology. Types of DNA: the genetic heritage. DNA extraction and quantification. Polymerase chain reaction (PCR). Genetic markers (STRs, SNPs, others). Databases of criminal interest. Organic Law 10/2007. Teaching unit 3. Lesson 11. Biological and non-biological evidence analysis techniques in Criminalistics. 11.1. Blood stain analysis. 11.2. Analysis of semen spots, saliva and other secretions. 11.3. Hair and nail analysis. 11.4. General systematic analysis of non-biological evidence (fibers, glass, paints, floors, explosive remains and fires). Teaching unit 3. Lesson 12. Analysis techniques in Forensic Archeology. Exhumation, removal and referral protocols for skeletal remains to the Forensic Anthropology laboratory. Teaching unit 3. Lesson 13. Analysis techniques in Forensic Anthropology. 13.1. Systematics of anthropological study in the laboratory. 13.2. Analysis of the biological profile (sex, age, height and ancestral group). 13.3. Analysis of individualizing characteristics and bone pathology for identification. 13.4. Estimation of age in the living subject. 13.5. Analysis of cremated human skeletal remains. Teaching unit 3. Lesson 14. Analysis techniques in forensic dentistry.



14.1. Introduction to dental identification. Reconstructive and comparative methods. 14.2. Dental anatomy: deciduous and permanent dentition. 14.3. Dental age: chronology of the dental eruption. 14.4. Dental notation systems: odontogram. Dental necro-identification using the INTERPOL dental file. 14.5. Other dental identification methods: palatoscopy, rugoscopy, cheiloscopy, radiographic overlay and analysis of the human bite. Teaching unit 3. Lesson 15. Analysis techniques in forensic pathology. 15.1. Study of wounds in the Criminalistics laboratory. Dynamics of the investigation (clothes, cutaneous plane, bone plane, instrument or weapon). 15.2. Vital and post-mortal reactions. Perimortem and postmortem wounds. 15.3. Examples: laboratory study of stab wounds, fractures and bruises, hanging grooves. Teaching unit 2. Lesson 8. Osteological and dental techniques: morphometry and odontometry. Skeletonization technique. Teaching unit 2. Lesson 9. Radiological techniques. Forensic photography and infographics. Teaching unit 3. Lesson 16. Analysis techniques in Forensic Ballistics of effects. 16.1. Ballistics and its parts. Firearms: definition, types and parts. Shooting elements. 16.2. Ballistics of effects: study of wounds by firearm in the Criminalistics laboratory (study of clothing, skin and bone planes). 16.3. Trigger residue analysis techniques. Teaching unit 3. Lesson 17. Introduction to forensic entomology and other laboratory analysis techniques for establishing the postmortal interval. 17.1. Concepts of diagnostic chronotaxodiagnostic and postmortal interval. 17.2. Fresh corpse: introduction to thanatochemistry. 17.3. Corpse in putrefaction: introduction to forensic entomology. 17.4. Ancient corpse: dating techniques. Teaching unit 3. Lesson 18. Analysis techniques in Forensic Genetics. 18.1. DNA and genetic heritage. Genetic profiling and genetic databases (reminder). 18.2. Criminal area: forensic genetic analysis in samples of criminal interest. 18.3. Civil sphere: biological investigation of paternity and maternity. 18.4. Forensic genetics in other areas: major catastrophes, multi-victim accidents, missing persons and cases of irregular adoption or abduction of newborns.



## Temporary organization of learning:

Block of content	Number of sessions	Hours
Units 1-18	30,00	60,00

## References

### BIBLIOGRAPHY

ANADÓN MJ, ROBLEDO MM (coords) (2017): Manual de Criminalística y Ciencias Forenses. Técnicas forenses aplicadas a la investigación criminal. Madrid: Editorial Tébar. 2ª edición. ANTON F, DE LUIS TURÉGANO JV (2004): Policía Científica. Vols. I y II. Valencia: Editorial Tirant Lo Blanch. BOSQUET S (2015): Criminalística Forense. Valencia: Editorial Tirant Lo Blanch. BURNS KR (2008): Manual de Antropología Forense. Barcelona: Edicions Bellaterra. CRESPILO M, BARRIO PA (2019): Genética Forense. Del laboratorio a los tribunales. Ediciones Díaz de Santos, S.A. DI MAIO VJM, DANA SE (2003): Manual de Patología Forense. Madrid: Ediciones Díaz de Santos. ETXEBERRIA F (2003): Lesiones por armas de fuego. Problemas médico-forenses. Cirugía, nº4. Disponible: <http://www.sc.ehu.es/scrwwwsr/kirurgia/Kirurgia2003e/Armasfuego.htm> ERICKSON E. (2013): Criminalistics Laboratory Manual. The Basics of Forensic Investigation. Taylor & Francis Inc, United States-Routledge. GARAMENDI PM, LÓPEZ-ALCARAZ M (2019): Situación actual de la estimación forense de la edad en menores extranjeros no acompañados en España. Revista Española de Medicina Legal 45:133-135. GISBERT CALABUIG JA. (2018): Medicina legal y toxicología. 6ª ed. Barcelona: Masson S.A. 7ª edición. HOSPITAL A. (2017): Métodos de identificación odontológica. En: XI Curso de Patología Forense. González J, Gutiérrez-Hoyos A (eds). Universidad de La Rioja. Logroño, pp. 83-100. MAGAÑA C. (2002): La entomología forense y su aplicación a la Medicina Legal. Data de la muerte. Revista del Centro de Estudios Jurídicos de la Administración de Justicia, nº 1, 93-110. POLO CERDÁ M, GARCÍA-PRÓSPER E, CRESPO ALONSO S, GALTÉS I, MARQUEZ-GRANT N, GARCÍA-RUBIO A, ARMENTANO N, MUÑOZ HERNÁNDEZ V (2018): Protocolo de búsqueda, levantamiento y exhumación de restos humanos. Revista Internacional de Antropología y Odontología Forense 1(1): 7-23. SÁNCHEZ SÁNCHEZ JA (coord.) (2015): Medicina legal y Forense. Vols. I y II. Editorial Tirant Lo Blanch. Valencia. SCHMELING A. (2019): Forensic age assessment. Revista Española de Medicina Legal 45:163-169. SERRULLA F. (coord.) (2013): Recomendaciones en Antropología Forense. Asociación Española de Antropología y Odontología Forense. SERRULLA F. (coord.) (2019): Armas de fuego y ciencias forenses. Edita: Asociación Galega de Médicos Forenses. VENTURA M. (2007): Manual de Medicina legal policial. Colección Universitat 24. Castellón: Universitat Jaume I. VILLALAIN JD, PUCHALT FJ (2000): Identificación antropológica policial y forense. Valencia: Editorial Tirant Lo Blanch. PCA-