



## Information about the subject

**Degree:** Bachelor of Science Degree in Nursing

**Faculty:** Faculty of Medicine and Health Sciences

**Code:** 1211104 **Name:** Clinical Biochemistry

**Credits:** 6,00 **ECTS Year:** 1 **Semester:** 1

**Module:** Common basic training

**Subject Matter:** Biochemistry **Type:** Basic Formation

**Field of knowledge:** Health sciences

**Department:** -

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

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

### Lecturer/-s:

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## Module organization

### Common basic training

Subject Matter	ECTS	Subject	ECTS	Year/semester
Anatomy	6,00	Human and Functional Anatomy	6,00	1/1
Physiology	12,00	Human Physiology	6,00	1/2
		Physiopathology	6,00	2/1
Biochemistry	6,00	Clinical Biochemistry	6,00	1/1
Biostatistic	6,00	Biostatistics and Research Methodology	6,00	1/2
Psychology	6,00	Psychology of Care	6,00	1/1
Pharmacology	6,00	Pharmacology	6,00	2/1
Nutrition	6,00	Nutrition and Dietetics	6,00	2/1
ICT	6,00	ICT	6,00	3/1
English	6,00	English	6,00	1/2
Life support	6,00	Emergency Care and Life Support	6,00	4/1

## Recommended knowledge

Pre-requisites: None established



## 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      That students are able to base nursing interventions on scientific evidence and available means.
- R2      That students are able to promote healthy lifestyles, self-care, supporting the maintenance of preventive and therapeutic behaviors.
- R3      That the students know the health information systems.
- R4      That students understand the molecular and physiological bases of cells and tissues.
- R5      That students know the physiopathological processes and their manifestations and the risk factors that determine the states of health and disease in the different stages of the life cycle.



## 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	Students have demonstrated possession and understanding of knowledge in an area of study that is at the core of general secondary education, and is often at a level that, while supported by advanced textbooks, also includes some aspects that involve knowledge from the cutting edge of their field of study.			X	
CB2	Students are able to apply their knowledge to their work or vocation in a professional way and possess the skills usually demonstrated by developing and defending arguments and solving problems within their area of study.			X	
CB3	Students have the ability to gather and interpret relevant data (usually within their area of study) to make judgments that include reflection on relevant social, scientific or ethical issues.		X		
CB4	That students can convey information, ideas, problems and solutions to both specialized and non-specialized audiences.	X			
CB5	Students have developed those learning skills necessary to undertake further study with a high degree of autonomy.		X		
SPECIFIC		Weighting			
		1	2	3	4
2b	To understand the molecular and physiological basis of cells and tissues.				X
10b	To know pathophysiological processes and their manifestations and the risk factors that determine the health and disease states in the different stages of their vital cycle.			X	



TRANSVERSAL		Weighting			
		1	2	3	4
6	To base interventions in nursing on scientific evidence and on the available means.		X		
9	To promote healthy life spans, to promote taking care of each person by themselves and support the maintenance of preventive and therapeutic measures.	X			



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

Assessed learning outcomes	Granted percentage	Assessment method
R1, R2, R3, R4, R5	75,00%	Theoretical written exams
R1, R2, R3, R4, R5	20,00%	Practical tests and works
R1, R4	5,00%	Submission of the final individual work and oral presentation

### Observations

#### Assessment

**Written final exam:** In order to add the rest of the marks, the student must pass the written test. Same for students of subsequent enrolments. This test will have two parts: One part will consist of some shorts questions to solve and second part will consist of multiple-choice questions. The student must achieve 50% of this in order to pass.

**Continuous assessment:** the student will keep a portfolio of classroom activities, written theory questionnaires etc. These activities will be taken into account. The student must achieve 10% of this in order to average with the final mark.

#### Grading.

- For those students who do not pass, the grades will be published over 10.
- Students who pass the exam but do not pass any of the remaining assessment tools will be graded 4.5. In the second enrollment, only those projects pending in order to pass the course will need to be submitted.
- For the students of second or successive enrollments it is not obligatory to attend the teaching sessions.

#### MENTION OF DISTINCTION:

The mention of Distinction will be awarded to students who have achieved a score equal to or greater than 9.5. The number of Distinctions granted will not exceed 5% of students enrolled in a subject in the corresponding academic year unless enrolment is under 20, in which case only one Distinction may be granted.

#### DEVELOPMENT OF THE SUBJECT IN SECOND AND SUBSEQUENT ENROLMENTS:

There will be a special group for students who are not enrolling for the first time, if they exceed the occupancy limit of the classroom and a lecturer is assigned to that group. The lecturer in charge of this group will conduct 6 follow-up sessions and tutoring of 2 hours each.



Assessment of skills and abilities will be done through the scheduled practice sessions. Assessment of contents and skills will be carried out as set in the official calendar for this course. Continuous assessment grades from the previous academic year will not be saved for subsequent enrolments. The student will need to do all the activities again every time they enroll.

## 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 Exposition of contents by the teacher, analysis of competencies, explanation and demonstration of abilities, skills and knowledge in the classroom.
- M2 Group work sessions supervised by the teacher. Case study, diagnostic analysis, problems, field study, computer room, visits, data search, libraries, network, Internet, etc. Significant construction of knowledge through student interaction and activity.
- M3 Supervised monographic sessions with shared participation.
- M4 Application of interdisciplinary knowledge.
- M5 Activities developed in spaces and with specialized equipment.
- 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 Student study: Individual preparation of readings, essays, problem solving, seminars, papers, memoirs, etc. To expose or deliver in the theoretical classes, practical classes and/or small group tutorials. Work done on the university platform ([www.plataforma.ucv.es](http://www.plataforma.ucv.es)).



- M9 Group preparation of readings, essays, problem solving, papers, memoirs, etc. To present or deliver in the theoretical classes, practical classes, seminars and/or small group tutorials. Work done on the university platform ([www.plataforma.ucv.es](http://www.plataforma.ucv.es)).

## IN-CLASS LEARNING ACTIVITIES

	LEARNING OUTCOMES	HOURS	ECTS
Face-to-face class M1	R1, R2, R3, R4, R5	40,00	1,60
Practice Classes M2, M3	R1, R4, R5	11,00	0,44
Laboratory M2, M5	R1, R4	2,00	0,08
Tutorial M6	R1, R4, R5	2,00	0,08
Evaluation M7	R1, R2, R3, R4, R5	5,00	0,20
<b>TOTAL</b>		<b>60,00</b>	<b>2,40</b>

## LEARNING ACTIVITIES OF AUTONOMOUS WORK

	LEARNING OUTCOMES	HOURS	ECTS
Student's self-employment M8	R1, R2, R3, R4, R5	70,00	2,80
Group work M9	R1, R2, R3, R4, R5	20,00	0,80
<b>TOTAL</b>		<b>90,00</b>	<b>3,60</b>





## Description of the contents

Description of the necessary contents to acquire the learning outcomes.

### Theoretical contents:

Content block	Contents
DIDACTIC UNIT I: Introduction to cellular and molecular biology. Introduction to Microbiology.	Topic 1-Elemental composition of living beings. Bio elements and biomolecules. Cellular processes. Bioenergetics. Cell metabolism: anabolism/catabolism. Topic 2-Molecular pathology: Brief introduction to microbiology.
DIDACTIC UNIT II: Introduction to Structural and Metabolic Biochemistry.	Topic 3. Carbohydrates. Concept and definition. Structure. Biological functions. Classification.  Topic 4. Carbohydrates. Catabolism, synthesis and storage of carbohydrates.  Topic 5. Lipids. Concept and definition. Structure. Biological functions. Classification.  Topic 6: Lipids. Catabolism, synthesis and storage of lipids.  Topic 7. Proteins. Concept and definition. Chemical structure and classification of amino acids. Levels of protein structuring. Biological functions.  Topic 8: Proteins. Catabolism and synthesis of amino acids. Metabolic use of amino groups: Transamination and deamination. Urea cycle.



## DIDACTIC UNIT III: Introduction to Clinical Biochemistry.

Topic 9. Introduction to Clinical Biochemistry. Phases of the analytical process. Introduction to the concept of markers (laboratory and cancer).

Topic 10. Study of proteins in Clinical Biochemistry: plasmatic proteins and in urine.

Topic 11. Role of the laboratory in haematological diseases. Laboratory and autoimmune diseases.

Topic 12. Alterations in the carbohydrate metabolism. Study of the function of the endocrine pancreas. Diabetes mellitus: metabolic alterations.

Topic 13. Alterations in hepatic function. Serological characterization of hepatitis. Main hepatic markers.

Topic 14. Alterations in lipid metabolism. Cardiovascular markers.

Topic 15. Alterations in respiratory function. Arterial blood gas analysis: Disorders of acid-base balance. Nephro-urological function disturbances.

Topic 16. Laboratory in endocrine-metabolic pathologies. Study of Thyroid and Adrenal Corticosteroid Function.

Topic 17. Disturbances of gastrointestinal function. Biochemistry in bone diseases.

Topic 18. Role of the Laboratory in the Care of Women and the Elderly. Analysis of toxic substances.

## DIDACTIC UNIT IV: Practice Module.

Practice 1. Initiation to Concentration Calculations and laboratory management.

Practice 2. Initiation in the handling of laboratory material.

Practice 3. Resolution of calculation of concentrations of biochemical parameters.



## Temporary organization of learning:

Block of content	Number of sessions	Hours
DIDACTIC UNIT I: Introduction to cellular and molecular biology. Introduction to Microbiology.	3,00	6,00
DIDACTIC UNIT II: Introduction to Structural and Metabolic Biochemistry.	11,00	22,00
DIDACTIC UNIT III: Introduction to Clinical Biochemistry.	14,00	28,00
DIDACTIC UNIT IV: Practice Module.	2,00	4,00

## References

Lehninger. Principles of Biochemistry. Cox, M.M. - Nelson, D.L. Macmillan Learning. 8ª Edición, 2021.

Stryer, Lubert; Berg, Jeremy M.; Tymoczko, John L. Biochemistry. Macmillan Learning. 9ª edición. 2019

William B. Coleman, Gregory J. Tsongalis. Molecular pathology: the molecular basis of human disease. 2ª Edición. Academic Press, 2019

### Websites:

- **Biorom 2010**, <http://sebbm.es/BioROM/indices/index.html>
- **Jena Library of Biological Macromolecules**: <http://www.fli-leibniz.de/IMAGE.html>
- **Biosfera project**. [http://recursostic.edl.es/de-la-patologia-al-laboratorio. Ergon. 2008](http://recursostic.edl.es/de-la-patologia-al-laboratorio/ergon-2008-educacion-es-ciencias/biosfera/web/profesor/index.htm)  
[educacion.es-ciencias/biosfera/web/profesor/index.htm](http://educacion.es-ciencias/biosfera/web/profesor/index.htm)



## Addendum to the Course Guide of the Subject

Due to the exceptional situation caused by the health crisis of the COVID-19 and taking into account the security measures related to the development of the educational activity in the Higher Education Institution teaching area, the following changes have been made in the guide of the subject to ensure that Students achieve their learning outcomes of the Subject.

**Situation 1: Teaching without limited capacity** (when the number of enrolled students is lower than the allowed capacity in classroom, according to the security measures taken).

In this case, no changes are made in the guide of the subject.

**Situation 2: Teaching with limited capacity** (when the number of enrolled students is higher than the allowed capacity in classroom, according to the security measures taken).

In this case, the following changes are made:

### 1. Educational Activities of Onsite Work:

All the foreseen activities to be developed in the classroom as indicated in this field of the guide of the subject will be made through a simultaneous teaching method combining onsite teaching in the classroom and synchronous online teaching. Students will be able to attend classes onsite or to attend them online through the telematic tools provided by the university (videoconferences). In any case, students who attend classes onsite and who attend them by videoconference will rotate periodically.

In the particular case of this subject, these videoconferences will be made through:

☒ Microsoft Teams

☐ Kaltura



## **Situation 3: Confinement due to a new State of Alarm.**

In this case, the following changes are made:

### **1. Educational Activities of Onsite Work:**

All the foreseen activities to be developed in the classroom as indicated in this field of the guide of the subject, as well as the group and personalized tutoring, will be done with the telematic tools provided by the University, through:

☒ Microsoft Teams

☐ Kaltura

Explanation about the practical sessions:

#### **SEMI-PRESENTIALITY SITUATION**

Dates and sessions are kept. The group of students is divided into 2, doing the same practices, but in 2 different rooms and with two responsible instructors. The evaluation will normally be carried out through the proposed checklist.

#### **SITUATION OF NO PRESENTIALITY**

Dates and sessions are kept. Each group is added to their session through TEAMS platform. It will work through the visualization of videos, resolution of clinical cases (with active participation), and kahoot-type activities. The evaluation will be carried out by completing the planned checklist, but with the support of the clinical cases worked on and uploaded as attachments, together with the responses recorded in the online activities and



participation in the session to validate the items.

## 2. System for Assessing the Acquisition of the competences and Assessment System

### ONSITE WORK

#### Regarding the Assessment Tools:

☒ The Assessment Tools will not be modified. If onsite assessment is not possible, it will be done online through the UCVnet Campus.

☐ The following changes will be made to adapt the subject's assessment to the online teaching.

Course guide		Adaptation	
Assessment tool	Allocated percentage	Description of the suggested changes	Platform to be used

The other Assessment Tools will not be modified with regards to what is indicated in the Course Guide.

#### Comments to the Assessment System: