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: Biochemestry **Type:** Basic Formation

Field of knowledge: Health sciences

Department: Biomedical Sciences

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
Biochemestry	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	4,50	ICT	4,50	This elective is not offered in the academic year 24/25
English	6,00	English	6,00	1/2
Life support	6,00	Emergency Care and Life Support	6,00	4/1

Recommended knowledge

No prerequisites specified

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	To describe the composition of the main biomolecules and relate their structure to their biological function.
R2	To explain the cellular structure and the differences between eukaryotic and prokaryotic cells.
R3	To explain the characteristics of the cell membrane and the main mechanisms of transport across it.
R4	To describe the morphological characteristics of the main microorganisms.
R5	To understand the processes of energy acquisition and utilization by the cell (metabolism: anabolism/catabolism).
R6	To explain the molecular basis, function, and regulation of different metabolic pathways.
R7	To identify the main parameters in clinical biochemistry and their normal ranges.
R8	To interpret biochemical parameters in major disorders.
R9	To describe the phases of the analytical process and solve concentration calculations.

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		

GENERAL		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			
16	To understand the systems of information related to health.	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		

Assessment system for the acquisition of competencies and grading system

Assessed learning outcomes	Granted percentage	Assessment method
R1, R2, R3, R4, R5, R6, R7, R8, R9	75,00%	Theoretical written exams
R1, R3, R7, R8, R9	25,00%	Practical tests and works
	0,00%	Attendance and active participation

Observations

Assessment.
Final exam:
All students will perform a written test as a single exam at the end of the subject. This test will consist of two parts: a first section on concepts and/or basic problems of the subject that must be overcome by the student and a second section of test questions that can be evaluated whenever the section of short short questions is exceeded. The final exam will have a value on the final grade of the 60%subject. It is necessary to have the final exam approved to be able to average with the indicated percentage of the notes of the continuous evaluation, and therefore to approve the subject.
Continuous assessment:
The student will carry out the activities proposed by the teacher who creates convenient to ensure the active participation of the students and the achievement of the skills established in this teaching guide.
Qualification. ·
The note that will appear in the minutes of the students suspended in the final exam will be the note of the examination over 10. · The students who have approved the exam, but have not exceeded a minimum of the continuous evaluation, will be qualified with 4.5 . · For students of second or successive enrollment, assistance to tutorials or teaching sessions is not mandatory.
Honor registration:
Honor registration mention may be granted to students who have obtained a rating equal to or greater than 9.5. Your number may not exceed the percentage set by current regulations. It will be only at the discretion of the professor.
Address of the subject in second and successive enrollment:
There will be a specific group for students that are not first registration and a teacher in charge of said group. The professor responsible for said group (second and successive enrollment), will contact students through the virtual campus, whereby the corresponding tutorials will indicate the

days and hours. The evaluation is the same as in the first call, being necessary to overcome the final exam to approve the subject and the rest of the works will be carried out according to the university platform and also must be submitted a minimum (10%) of said jobs to average with the final exam note.
International mobility students:
Students will have to contact at the beginning of the subject with the teacher via platform. The monitoring will be carried out via platform where the different works required will be hung. The evaluation will consist of the final exam (whose value will involve 70% of the total note) and continuous evaluation (conduct of written tests on the 30% platform).

MENTION OF DISTINCTION:
In accordance with the regulations governing the assessment and grading of subjects in force at UCV, the distinction of "Matrícula de Honor" (Honours with Distinction) may be awarded to students who have achieved a grade of 9.0 or higher. The number of "Matrículas de Honor" (Honours with Distinction) may not exceed five percent of the students enrolled in the group for the corresponding academic year, unless the number of enrolled students is fewer than 20, in which case a single "Matrícula de Honor" (Honours with Distinction) may be awarded. Exceptionally, these distinctions may be assigned globally across different groups of the same subject. Nevertheless, the total number of distinctions awarded will be the same as if they were assigned by group, but they may be distributed among all students based on a common criterion, regardless of the group to which they belong. The criteria for awarding "Matrícula de Honor" (Honours with Distinction) will be determined according to the guidelines stipulated by the professor responsible for the course, as detailed in the "Observations" section of the evaluation system in the course guide.

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.
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).

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).

IN-CLASS LEARNING ACTIVITIES

	LEARNING OUTCOMES	HOURS	ECTS
In-campus interactive lecture M1	R1, R2, R3, R4, R5, R6, R7, R8, R9	40,00	1,60
Practice Classes M2	R7, R8, R9	11,00	0,44
Laboratory M5	R9	5,00	0,20
Tutorial M6	R1, R2, R3, R4, R5, R6, R7, R8, R9	2,00	0,08
Evaluation M7	R1, R2, R3, R4, R5, R6, R7, R8, R9	2,00	0,08
TOTAL		**60,00**	**2,40**

LEARNING ACTIVITIES OF AUTONOMOUS WORK

	LEARNING OUTCOMES	HOURS	ECTS
Student's self-employment M8	R1, R2, R3, R4, R5, R6, R7, R8, R9	70,00	2,80
Group work M9	R7, R8	20,00	0,80
TOTAL		**90,00**	**3,60**

Description of the contents

Description of the necessary contents to acquire the learning outcomes.

Theoretical contents:

Content block	Contents
Block 1. Introduction to cell and molecular biology.	Topic 1. Elementary composition of living beings. Bioelements and biomolecules. Cellular processes Bioenergetics Cell metabolism: anabolism/catabolism. Topic 2. Molecular pathology: Brief introduction to microbiology.
Block 2. Introduction to structural and metabolic biochemistry.	Topic 3. carbohydrates. Concept and definition. Structure. Biological functions. Classification. Topic 4. carbohydrates. Catabolism, synthesis and carbohydrate storage. Topic 5. Lipids. Concept and definition. Structure. Biological functions. Classification. Topic 6: Lipids. Catabolism, synthesis and lipid storage. Topic 7. Protids. Concept and definition. Chemical structure and amino acid classification. Protein structuring levels. Biological functions. Topic 8: Protids. Catabolism and synthesis of amino acids. Metabolic destination of the amino groups: transamination and deamination. Urea cycle.

Block 3. 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. Protein study in clinical biochemistry: plasma and urine proteins. Topic 11. Laboratory paper in hematological diseases. Laboratory and autoimmune diseases. Topic 12. Alterations of glucidic metabolism. Study of the function of the endocrine pancreas. Diabetes mellitus: metabolic alterations. Topic 13. Hepatic function alterations. Serological characterization of hepatitis. Main liver indicators. Topic 14. Alterations of lipid metabolism. Cardiovascular markers. Topic 15. Alterations of nephro-urological function. Acid-base balance disorders. Topic 16. Laboratory in Endocrine-Metabolic Pathologies. Study of thyroid and corticosuprenal function Topic 17. Laboratory role in care for women and the elderly.
Block 4. Practical Module	Practice 1. Initiation to concentration calculations and handling in the laboratory. Practice 2. Initiation in the management of laboratory material.

Temporary organization of learning:

Block of content	Number of sessions	Hours
Block 1. Introduction to cell and molecular biology.	3,00	6,00
Block 2. Introduction to structural and metabolic biochemistry.	11,00	22,00
Block 3. Introduction to clinical biochemistry.	14,00	28,00
Block 4. Practical Module	2,00	4,00

References

Lehninger. Principles of biochemistry. COX, M.M. - Nelson, D.L. Omega Editorial. 7th edition, 2018.
Stryer, Lubert; Berg, Jeremy M.; Tymoczko, John L. Biochemistry. Editorial reverted. 7th edition. 2013
William B. Coleman, Gregory J. Tsongalis. Molecular Pathology: The Molecular Basis of Human Disease. 2nd edition. Academic Press, 2017
Castaño López, M.A., Díaz Portillo, Jacobo, Paredes Salido, Fernando. Clinical biochemistry: from pathology to the laboratory. Ergon 2008
Web resources:
- Biorom 2010, a compendium of learning for learning in biochemistry, molecular biology and biotechnology. The address is: http://sebbm.es/biorom/indices/index.html
- Macromolecules Library of Biological Interest in “Jena Library of Biological Macromolecules”: http://www.fli-leibniz.de/image.html
- Biosphere Project. Basic Biology concepts. http://recursostic.educacion.es/ciences/biosfera/web/profesor/index.htm