



## Information about the subject

**Degree:** Bachelor of Science Degree in Human Nutrition and Dietetics

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

**Code:** 1311105 **Name:** Biochemistry

**Credits:** 6,00 **ECTS Year:** 1 **Semester:** 2

**Module:** Basic Science Module

**Subject Matter:** Biochemistry **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

### Basic Science Module

Subject Matter	ECTS	Subject	ECTS	Year/semester
Biology	6,00	Biology and Genetics	6,00	1/1
Biochemistry	6,00	Biochemistry	6,00	1/2
Chemistry	12,00	Basic Fundamentals of Chemistry	6,00	1/1
		Organic Chemistry	6,00	1/2
Physiology	12,00	Physiology	6,00	1/2
		Physiology II	6,00	2/1
Statistics	6,00	Biostatistics	6,00	1/1
Human Anatomy	6,00	Human Anatomy	6,00	1/1
Psychology	6,00	Psychology	6,00	2/1
Anthropology	12,00	Anthropology	6,00	1/1
		Food and Culture	6,00	4/1



## 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 Understanding and assimilation of the concepts included in the content of the course.
- R2 Ability to solve problems related to these contents using different resources.
- R3 Ability to work in a laboratory by correctly performing basic operations and observing the corresponding safety regulations. Correct understanding of the planning, development and purpose of the experience.
- R4 Understanding and proper use of language, as well as correct writing and presentation of data.
- R5 Collaboration with the teacher and colleagues throughout the learning process: Attendance to theoretical, practical or tutoring sessions; Teamwork; Respect in the treatment; Compliance with the rules of organization of the subject for the benefit of all.



## 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 demonstrate knowledge and understanding 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	

GENERAL	Weighting			
	1	2	3	4
CG12 Students know the nutrients, their function in the organism, their bioavailability, the needs and recommendations, and the bases of the energetic and nutritional balance.				X

SPECIFIC	Weighting			
	1	2	3	4
CE01 Students know the chemical, biochemical and biological fundamentals of application in human nutrition and dietetics.				X



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

Assessed learning outcomes	Granted percentage	Assessment method
R5	5,00%	Evaluation of the use of the practical classes in the classroom, of problems or computers, seminars and tutorials. Through attendance, and participation in the different activities proposed.
R1, R4	65,00%	Written evaluation of the knowledge and skills obtained. The test may consist of a series of open-ended or multiple-choice questions on the theoretical content of the subject and/or practical exercises (problem solving).
R2, R3, R5	15,00%	Assessment of practical laboratory work, or laboratory culinary techniques workshop, through which the competencies acquired must be demonstrated and that they are capable of being used to solve the different situations and problems that arise in a laboratory; this assessment may be carried out by one of the following methods, or a combination of several of them: an individual written test, the individual or group performance of a laboratory experience, the submission of an individual or group report on the work carried out in the laboratory
R1, R2, R4	15,00%	Evaluation of individual or group practices or activities, in which information related to each of the subjects must be sought and structured, and cases or problems resolved. This is done through a system of continuous evaluation throughout the course, which involves the delivery and / or exposure of work, whose objectives and content will be proposed by the teacher.

### Observations

A minimum grade of 5 out of 10 is required in the written evaluation to be able to average.  
Attendance to laboratory practices is mandatory.



## 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 capacities, skills and knowledge in the classroom. The blackboard, the computer and the cannon will be used to display texts, graphics, etc.
- M2 Resolution of practical exercises and case studies, analysis of evaluation procedures and procedural intervention. All this with the support of the teacher. This aspect can be controlled through attendance and active participation in the practical sessions.
- M3 Resolution of practical exercises and case studies, analysis of evaluation procedures and procedural intervention. All this with the support of the teacher. This aspect can be controlled through attendance and active participation in the practical sessions.
- M5 Student study: individual preparation of readings, essays, problem solving, seminars, papers, reports, etc. for discussion or delivery in electronic format.
- M7 Personalised attention and in small groups. Period of instruction and/or orientation carried out by a tutor with the aim of reviewing and discussing the materials and topics presented in the classes, seminars, readings, completion of assignments, etc. The attendance of the student and his/her level of gradual development in the knowledge of the subjects will be evaluated.
- M8 A set of tests, written or oral, used in the evaluation of the student.



M9 Group preparation of readings, essays, problem solving, seminars, papers, reports, etc... for discussion or delivery.

## IN-CLASS LEARNING ACTIVITIES

	LEARNING OUTCOMES	HOURS	ECTS
Theoretical lessons M1	R1, R2, R4, R5	36,00	1,44
Practice lessons M2	R3, R4, R5	5,00	0,20
Laboratory M3	R3, R4, R5	15,00	0,60
Office Hours M7	R1, R5	2,00	0,08
Evaluation M8	R1, R2, R4	2,00	0,08
<b>TOTAL</b>		<b>60,00</b>	<b>2,40</b>

## LEARNING ACTIVITIES OF AUTONOMOUS WORK

	LEARNING OUTCOMES	HOURS	ECTS
Autonomous work M5	R1, R2, R3, R4, R5	70,00	2,80
Group work M9	R3, 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
TEACHING UNIT I: Structure of biomolecules and catalysis	<ol style="list-style-type: none"><li>1. The Foundations of Biochemistry</li><li>2. Water</li><li>3. Carbohydrates. Structure. Classification. Functions.</li><li>4. Lipids. Structure. Classification. Functions.</li><li>5. Amino Acids, Peptides and Proteins. Structure. Properties. Classification. Functions.</li><li>6. Enzymes. Enzymatic Kinetics. Mechanisms. Regulatory enzymes</li><li>7. Nucleotides and Nucleic Acids.</li><li>8. Vitamins and coenzymes</li></ol>
TEACHING UNIT II: Genetic information flow	<ol style="list-style-type: none"><li>9. Genetic information replication, transcription and translation</li></ol>
TEACHING UNIT III: Bioenergetics and metabolism	<ol style="list-style-type: none"><li>10. Metabolism introduction and organization.</li><li>11. Electronical transport chain and synthesis of ATP.</li><li>12. Acetyl-CoA and the Citric acid cycle.</li><li>13. Carbohydrate metabolism.</li><li>14. Lipid metabolism.</li><li>15. Protein metabolism.</li><li>16. Hormonal regulation of metabolism. Hormone structure and function.</li></ol>





## Temporary organization of learning:

Block of content	Number of sessions	Hours
TEACHING UNIT I: Structure of biomolecules and catalysis	12,00	24,00
TEACHING UNIT II: Genetic information flow	3,00	6,00
TEACHING UNIT III: Bioenergetics and metabolism	15,00	30,00

## References

### MAIN BIBLIOGRAPHY

- LEHNINGER. **PRINCIPIOS DE BIOQUÍMICA**. Cox, M.M. - Nelson, D.L. Editorial Omega, 2014. Sexta edición.
- BIOQUÍMICA. Curso Básico**. Tymoczko, John L.; Berg, Jeremy M.; Stryer, Lubert L. Editorial Reverté. 2014.
- BIOQUÍMICA**. Matthews, C.K., et al. Editorial PEARSON, 2013. Cuarta Edición

### ADDITIONAL BIBLIOGRAPHY

- BIOQUÍMICA**. Stryer Lubert L.; Berg Jeremy M.; Tymoczko, John L. Editorial Reverté, S.A. Barcelona. 2013. 7ª Edición.
  - BIOLOGÍA MOLECULAR DE LA CÉLULA**. Alberts, B., et al. Editorial Omega, 2016. 6ª Edición.
  - BQTEST: 1000 PREGUNTAS TIPO TEST DE BIOQUÍMICA PARA UNIVERSITARIOS**. Blas Pastor, J.R. 2013. 1ªed.
- Web resources:  
**Biorom 2011**.  
<http://www.biorom.uma.es/indices/index.html>



## 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:



## 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: