



## Information about the subject

**Degree:** Bachelor of Science Degree in Biotechnology

**Faculty:** Faculty of Veterinary Medicine and Experimental Sciences

**Code:** 1100308 **Name:** Virology

**Credits:** 6,00 **ECTS Year:** 3 **Semester:** 2

**Module:** Fundamentals of Biology

**Subject Matter:** Virology **Type:** Compulsory

**Department:** Basic and Cross-disciplinary Sciences

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

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

### Lecturer/-s:

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## Module organization

### Fundamentals of Biology

Subject Matter	ECTS	Subject	ECTS	Year/semester
Biology	12,00	Cell Biology	6,00	1/1
		Plant and Animal Biology	6,00	1/1
Animal physiology	6,00	Animal Physiology	6,00	2/2
Plant Biology	6,00	Plant Physiology	6,00	2/1
Microbiology	6,00	Microbiology	6,00	2/1
Virology	6,00	Virology	6,00	3/2

## Recommended knowledge

General knowledge of molecular and cellular biology.



## 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 The student has understood and assimilated the contents of the subject.
- R2 The student is able to solve problems or case studies related to the subject contents, by using different resources (bibliographic, IT, etc.)
- R3 The student is able to work in a laboratory, carrying out basic operations correctly and taking into account the corresponding safety standards. He/she understands the planning, development and purpose of the experience, and is able to contrast and validate the obtained results.
- R4 The student is able to write an intelligible and organized text on different aspects of the subject.
- R5 The student is able to present and defend his/her work adequately.
- R6 The student seeks bibliographic information from different sources and can analyze it with a critical and constructive spirit.
- R7 The student collaborates with the teacher and his/her peers throughout the learning process; he/she works in a team; treats everyone with respects, is proactive and fulfills the organization rules of the course.



## 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 acquire and understand knowledge in their field of study based on general secondary education but usually reaching a level that, although supported on advanced text books, also includes aspects involving state-of-the-art knowledge specific to their area.	X			
CB2	Students are able to apply knowledge to their work in a professional way and have the competences enabling them to state and defend views and opinions as well as perform problem-solving tasks in their field of study.	X			
CB3	Students are able to collect and interpret relevant data (generally in their field of study) and give opinions that involve reflection on relevant social, scientific or ethical issues.	X			
CB4	Students can communicate information, ideas, problems and solutions to a specialized or non-specialized audience.			X	
CB5	Students develop the necessary learning skills to undertake further studies with a high level of autonomy.			X	

GENERAL		Weighting			
		1	2	3	4
CG01	Capacity to analyze and synthesize.			X	

SPECIFIC		Weighting			
		1	2	3	4
CE22	Knowing and understanding contents, principles and theories related to biotechnology.				X



CE23	Knowing how to use laboratory equipment and to carry out basic operations for each discipline including: safety measures, handling, waste disposal and activity register.				X
CE24	Knowing basic and instrument laboratory techniques in the different areas of biotechnology.			X	
CE25	Knowing how to analyze and understand scientific data related to biotechnology.			X	
CE26	To understand and identify the mechanisms that influence genetic inheritance	X			
CE30	Solving and analyzing problems posed by biotechnology.			X	
CE31	Describing and calculating important variables of processes and experiments.		X		
CE34	Knowing main characteristics of Molecular biosciences and biotechnology communication.	X			

TRANSVERSAL	Weighting			
	1	2	3	4
CT02	Capacity to organize and plan.	X		
CT03	Mastering Spanish oral and written communication.		X	
CT05	Knowing and applying Basic ITC skills related to Biotechnology.	X		
CT06	Capacity to manage information (capacity to look for and analyze information coming from different types of sources).		X	
CT07	Problem solving.		X	
CT08	Decision making		X	
CT09	Capacity to work in interdisciplinary and multidisciplinary team.		X	
CT10	Interpersonal skills.		X	
CT11	Understanding multicultural and diverse environment	X		



CT12	Critical and self-critical capacity.	x		
CT13	Ethics.	x		
CT14	Capacity to learn			x
CT15	Capacity to adapt to new situations		x	
CT16	Capacity to produce new ideas (creativity)			x
CT17	Leadership abilities		x	
CT18	Taking initiatives and enterprising spirit		x	
CT19	Capacity to apply theoretical knowledge			x
CT20	Research skills			x
CT21	Sensitivity to environmental issues	x		



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

Assessed learning outcomes	Granted percentage	Assessment method
R1	70,00%	Written test
R1, R2, R4, R5, R6, R7	20,00%	Submission of papers
R1, R2, R3, R7	10,00%	Laboratory test

### Observations

According to the general evaluation and qualification regulations, the preferred evaluation system will be by means of continuous evaluation:

- Assignments: The evaluation of this item consists of a series of active work activities to be carried out in the classroom, in the laboratory or through the virtual classroom, following a continuous evaluation process.
- Theoretical classes: active participation will be assessed by means of attendance and the delivery of the activities carried out during the classroom session itself.
- Laboratory Practices: active participation will be assessed through attendance and delivery of the results of the experiments carried out during each laboratory session.
- Activities in the Virtual Classroom: active participation in the autonomous work activities, carried out in the virtual classroom or equivalent digital media, will be assessed through the completion and delivery of these activities, within the stipulated deadlines.

This subject cannot be assessed by means of a single assessment.

**\* You need to get at least 45% points at each assessment item to average it with other assessment tools. If this minimum is not reached on the item you can not join the other assessment tools to calculate the final mark. Attendance at laboratory sessions to qualify for passing the subject is needed (or if an absence occurs, it must be properly justified).**

Attendance at laboratory sessions is compulsory. If an absence occurs, it must be duly justified. In any case, each absence will subtract 20% from the final evaluation grade of the practicals. At the end of each practice session, the student must ask the teacher for the "attendance sheet" and sign it, so that there is proof of attendance at the session.

The use of tools based on artificial intelligence (AI) is subject to the teacher's criteria, who may



establish specific limits or conditions depending on the training or assessment activity.

## 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 9 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 Teacher presentation of contents, analysis of competences, explanation and in-class display of skills, abilities and knowledge.
- M2 Group work sessions supervised by the professor. Case studies, diagnostic tests, problems, field work, computer room, visits, data search, libraries, on-line, Internet, etc. Meaningful construction of knowledge through interaction and student activity.
- M3 Activities carried out in spaces with specialized equipment.
- M4 Supervised monographic sessions with shared participation..
- M5 Application of multidisciplinary knowledge.
- M6 Personalized and small group attention. Period of instruction and/or guidance carried out by a tutor to review and discuss materials and topics presented in classes, seminars, readings, papers, etc.
- M7 Set of oral and/or written tests used in initial, formative or additive assessment of the student





- M8 Group preparation of readings, essays, problem-solving, seminars, papers, reports, etc. to be presented or submitted in theoretical , practical and/or small-group tutoring sessions. Work done on the university e-learning.
- M9 Student's study: Individual preparation of readings, essays, problem-solving, seminars, papers, reports, etc. to be presented or submitted in theoretical, practical and/or small-group tutoring sessions. Work done on the university e-learning platform.



## IN-CLASS LEARNING ACTIVITIES

	LEARNING OUTCOMES	HOURS	ECTS
ON-CAMPUS CLASS M1	R1, R2, R5, R7	37,50	1,50
PRACTICAL CLASSES M2	R1, R2, R4, R5, R6, R7	4,10	0,16
LABORATORY M3	R1, R2, R3, R5, R6, R7	10,40	0,42
SEMINAR M4	R1, R4, R5, R7	2,00	0,08
GROUP PRESENTATION OF ASSIGNMENTS M5	R1, R2, R4, R5, R6, R7	2,00	0,08
TUTORIAL M6	R1, R7	2,00	0,08
ASSESSMENT M7	R1	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 GROUP WORK M8	R1, R2, R4, R5, R6, R7	18,00	0,72
AUTONOMOUS INDIVIDUAL WORK M9	R1, R2, R4, R6	72,00	2,88
<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 1	INTRODUCTION TO VIROLOGY. OVERVIEW OF VIRUSES AND THE REPLICATIVE CYCLE. CLASSIFICATION AND NOMENCLATURE OF VIRUSES. INTRODUCTION TO IMMUNOLOGY. BASIC TECHNIQUES IN VIROLOGY.
DIDACTIC UNIT 2	STRUCTURE OF VIRAL PARTICLES AND VIRUS GENOMES. MOLECULAR BIOLOGY OF THE REPLICATION AND EXPRESSION OF VIRUSES.
DIDACTIC UNIT 3	VIRAL IMMUNOLOGY. INTERACTION VIRUS-CELL. INFECTION AND VIRAL PATHOGENESIS.
DIDACTIC UNIT 4	THE VIRAL REPLICATIVE CYCLE: EXAMPLES OF REPRESENTATIVE VIRUSES.
DIDACTIC UNIT 5	PRIONS, VIROIDS, SATELITE VIRUSES.
Laboratory practices	Practical sessions in the laboratory.



## Organization of the practical activities:

	Content	Place	Hours
PR1.	DIAGNOSIS OF VIRAL INFECTIONS	Laboratory	1,00
PR2.	ISOLATION AND PURIFICATION OF VIRUSES FROM FIELD SAMPLES	Laboratory	2,00
PR3.	TITRATION METHODS IN VIROLOGY	Laboratory	6,00
PR4.	PRACTICAL PROJECT IN MOLECULAR VIROLOGY	Computer	3,00
PR5.	Study cases	Lecture room	2,10

## Temporary organization of learning:

Block of content	Number of sessions	Hours
DIDACTIC UNIT 1	7,00	14,00
DIDACTIC UNIT 2	9,00	18,00
DIDACTIC UNIT 3	4,00	8,00
DIDACTIC UNIT 4	4,00	8,00
DIDACTIC UNIT 5	1,00	2,00
Laboratory practices	5,00	10,00



## References

### BASIC BIBLIOGRAPHY:

- Principios de virología molecular. A.J. Cann. 4ª edición ed. Acribia. 2009
- Cann's Principles of Molecular Virology, Seventh Edition. Edward Rybicki. Academic Press. 2023
- Virology: Principles and Applications. John Carter, Venetia Saunders. Wiley; 2ª Edición. 2013
- Inmunología básica: Funciones y trastornos del sistema inmunitario. Abul K. Abbas et al Elsevier; 7ª Edición. 2024

### FURTHER READING:

- Principles of Virology. Molecular biology, pathogenesis and control. Flint, S.J. et al. ASM Press 2009.
- Field's Virology B.N. Fields, D.M. Knipe, P.M. Howley, R.M. Chanock, J.L. Melnick, T.P. Monath, B. Roizman, and S.E. Straus, eds.). Lippincott-Raven, Philadelphia, PA. 2013.
- Introduction to modern virology. (6ª ed.) Dimmock NJ, Easton AJ, Leppard KN. Blackwell Science.
- Understanding Viruses. Teri Shors. Jones & Bartlett Learning, 2011