



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: -

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

*** 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.

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 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 |
| TOTAL | | 60,00 | 2,40 |

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 |
| TOTAL | | 90,00 | 3,60 |



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. | PRACTICAL PROJECT IN MOLECULAR VIROLOGY | Laboratory | 7,00 |
| PR4. | PRACTICAL PROJECT IN MOLECULAR VIROLOGY | Computer | 2,00 |
| 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:

- **Principles of Molecular Virology**, A.J. Cann 6th Edition. Academic Press. 2015
- **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; 4ª Edición. 2014

FURTHER READING:

- **Principios de virología molecular**. A.J. Cann. 4ª edición ed. Acribia. 2009 (edición anterior en español del libro de Cann, prácticamente idéntica en contenidos a la edición inglesa del 2015)
- **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