COURSE DATA

DATA SUBJECT

Code: 46470
Name: Medical Virology
Cycle: Master's Degree
ECTS Credits: 4.5
Academic year: 2026-27

STUDY (S)

Degree	Center	Acad. year	Period
2251 - Master¿s Degree in Virology	Facultat de Ciències Biològiques	1	First quarter

SUBJECT-MATTER

Degree	Subject-matter	Character
2251 - Master¿s Degree in Virology	Virología Médica	COMPULSORY

COORDINATION

RODRIGUEZ DIAZ JESUS

SUMMARY

The subject of Medical Virology of the Master's Degree in Virology of the University of Valencia analyses the importance of viruses as agents producing infections in humans, with special emphasis on their transmission routes and epidemiology, as well as their pathogenic mechanisms, tropism and relationship with the symptomatology of viral diseases. The clinical manifestations of DNA and RNA virus infections are systematically presented in an order defined by taxonomy and the clinical syndromes they generate. Diagnostic procedures are described, from the collection of samples to the methods applied in the laboratory for virus detection, both by classical and molecular virology, or by serological diagnosis. Current treatments with antivirals of proven efficacy against viruses, or supportive therapies in those cases where no specific treatment is yet available, are reported. Vaccines applied for the prevention of different viral diseases and those currently under research and development are studied.

PREVIOUS KNOWLEDGE

RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE

There are no specified enrollment restrictions with other subjects of the curriculum.

OTHER REQUIREMENTS

No specific prior knowledge is required, beyond that necessary to access the Master's program.

COMPETENCES / LEARNING OUTCOMES

2251 - Master¿s Degree in Virology

Place the specialty in the context of other fields and general knowledge.

Students should be able to integrate knowledge and address the complexity of making informed judgments based on incomplete or limited information, including reflections on the social and ethical responsibilities associated with the application of their knowledge and judgments.

Students should demonstrate self-directed learning skills for continued academic growth.

Students should possess and understand foundational knowledge that enables original thinking and research in the field.

To achieve an integrative knowledge, drawing general conclusions from specific case studies, transferring conclusions to other speciality areas and establishing connections between different subjects.

To analyze viral diseases from complementary approaches taking into account the structural characteristics of a virus, the target organs, the progression of the infection and the symptomatology.

To apply fundamental virology concepts to practical problem solving, including antiviral therapy, prevention, public health, and the biotechnological applications of viruses.

To develop critical thinking, identifying the limits and biases of knowledge in the field of specialization.

To know major human viruses and the pathologies they cause, as well as the biomedical or epidemiological interventions would be the most appropriate for their treatment and control.

To understand natural processes relevant to the field of specialization.

DESCRIPTION OF CONTENTS

1. Introduction to Medical Virology

Importance of viruses as infectious agents. Major milestones in the development of medical virology. Clinical virology and viral diagnosis. Direct and serological diagnostic methods. Human virome. Concepts of prevention, treatment and control of viral diseases.

2. Human pathogenic DNA viruses

Herpesviridae: Herpes simplex virus, Varicella-zoster virus, Cytomegalovirus, HHV-6, HHV-7, Epstein-Barr

virus and HHV-8. Adenoviridae. Poxviridae. Papillomaviridae. Polyomaviridae. Parvoviridae: Parvovirus B19. Main clinical manifestations and diseases caused by members of the Herpesviridae family. Viral infections in transplanted patients. Cutaneous viral infections. Congenital viral infections.

3. Human pathogenic RNA viruses (I)

Orthomyxoviridae: Influenza virus. Paramyxoviridae. Togaviridae: Rubivirus. Coronaviridae: SARS-CoV-2 virus. Rhabdoviridae. Filoviridae. Bornaviridae. Picornavirales: Picornaviridae. Enteroviruses.
Respiratory diseases of viral etiology. Influenza. Coronavirus diseases: SARS, MERS, COVID-19. Rabies in humans, prototype of zoonotic disease. Viral exanthematous diseases. Neurological syndromes of viral etiology. Viral cardiomiopathies.

4. Human pathogenic RNA viruses (II)

Reoviridae: rotaviruses. Caliciviridae. Astroviridae. Togaviridae: Alphavirus. Flaviviridae. Bunyavirales. Arenaviridae. Hantaviridae.
Gastrointestinal virus diseases. Exotic and emerging viruses. Arboviruses (arthropod borne viruses) and roboviruses (rodent borne viruses).

5. Hepatitis viruses

Hepatitis viruses: Family Picornaviridae: genus Hepatovirus: hepatitis A virus. Family Hepeviridae: hepatitis E virus. Family Hepadnaviridae: hepatitis B virus. Family Kolmioviridae: Deltavirus genus: Delta virus. Family Flaviviridae: hepatitis C virus.

6. Viral oncogenesis: viruses and cancer

Oncogenic DNA and RNA viruses. Viruses and tumors. Viral oncogenes. Cell transformation.

7. Human retroviruses

Oncogenic retroviruses. HTLV-I and HTLV-II viruses. Lentivirus: HIV-1 and HIV-2. AIDS: pathogenesis, clinical, diagnosis and treatment.

8. Subviral agents in human pathology: Prions.

Prions. Transmissible spongiform encephalopathies in humans.

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	Hours
Theory	45,00
Total hours	**45,00**

NON PRESENCIAL ACTIVITIES

Activity	Hours
Attendance at other activities	0,00
Individual or group project	0,00
Independent study and work	61,50
Preparation of lessons	0,00
Preparation for assessment activities	4,00
Resolution of case studies	0,00
Total hours	**65,50**

TEACHING METHODOLOGY

The course is based on the use of different teaching/learning activities among which the following are included:

- **Lectures**, in which the teacher will provide an overview of the fundamental concepts in each of the topics. Prior to the class, the material presented will be accessible to students through the university's teaching support platform.
- **Invited talks** by national or international experts on a topic related to the subject.
- **Face-to-face review** of content and discussion led by the faculty, which will function as group tutorials. It will serve for the follow-up and, if necessary, continuous evaluation of the students. Likewise, students will raise doubts and questions about the subject.
- **Discussion and debate in the classroom** of scientific articles and current issues, usually as a final part of the subject, where topics of interest will be addressed. For example, questions such as how many different viruses are estimated to exist in nature, whether there are evolutionary relationships between different virus families or whether they have independent origins, whether viroids are relics of the RNA world, why certain types of viruses are more abundant in plants/animals/bacteria than others, whether it is possible to predict pandemics, etc. will be discussed.
- **On-line tutorials**, for the resolution of doubts and specific problems, the raising of questions of interest and debate on current scientific and social issues related to the subject.
- **Autonomous self-evaluation activities**, such as performing tests through Aula Virtual, which allow the students to evaluate their own learning.
- **Autonomous study** of materials and contents, where students will review and, if necessary, expand the knowledge imparted by using notes, presentations, relevant bibliography, etc.
- **Bibliographic review** and synthesis carried out by students (individually or in teams), a voluntary activity where students may review a topic of their choice and preferably present it during class time.

EVALUATION

- **Exam**. It will be held at the end of the course and it will be an indispensable condition to pass the course to obtain at least a score of 5 out of 10. It will preferably be a written test, although it may also be oral if the teacher considers it more convenient.
- **Continuous evaluation** by means of partial tests on each subject through the Aula Virtual platform or an alternative method. This mode of evaluation will determine between 20% and 40% of the grade obtained in the subject, the rest corresponding to the final exam, unless voluntary assignments are submitted, as indicated in the following section (the need to obtain a 5/10 in the final exam is maintained regardless of the continuous assessment). In case of failing the course, the grade obtained in the continuous evaluation will be maintained for the next call, but not for the next course enrollment.
- **Assessment of voluntary work** presented by the students, preferably orally and during class time. When such activities are offered, they may account for up to 20% of the final mark for the subject. In case of failing the course, the grade of this work will be maintained for the next call and also for the following enrollment.

It will not be possible to renounce the grade obtained in the course once it has been published.

REFERENCES

- Knipe, D.M., Howley, P.M. 2020. Fields Virology: Emerging Viruses. 7ª ed. Wolters Kluwer/Lippincott, Williams & Wilkins, Philadelphia. ISBN-10: 1975112547
- Knipe, D.M., Howley, P.M. 2021. Fields Virology: DNA Viruses 7ª ed. Wolters Kluwer/Lippincott, Williams & Wilkins, Philadelphia. ISBN-10: 1975112571.
- Knipe, D.M., Howley, P.M. 2022. Fields Virology: RNA Viruses 7ª ed. Wolters Kluwer/Lippincott, Williams & Wilkins, Philadelphia. ISBN-10: 1975112601.
- Referencia b4: Loeffelholz, M., Hodinka, R.L., Young, S.A., Pinksy, B.A. 2016. Clinical Virology Manual. 5ª ed. ASM Press, Washington D.C.
- Mahy, B.W., Van Regenmortel, M.H.V. 2010. Desk Encyclopedia of Human and Medical Virology. Academic Press, Amsterdam.
- Carrasco, L., Almendral del Río, J.M. 2006. Virus patógenos. Editorial Hélice. Fundación BBVA, Madrid.
- Murray, P.R., Rosenthal, K.S., Pfaller, M.A. 2017. Microbiología Médica. 8ª ed. Elsevier, Barcelona.
- Collier, L., Oxford, J. 2006. Virología humana. 3ª ed. McGraw Hill, México D.F.
- Sompayrac L. 2012. How pathogenic viruses think. Making sense of Virology. Jones & Bartlett Learning. ISBN-10: 9781449645793