



DISCIPLINE SHEET

1. Data about the programme

1.1.	"CAROL DAVILA" UNIVERSITY OF MEDICINE AND PHARMACY
1.2.	FACULTY OF MEDICINE
1.3.	CLINICAL DEPARTMENT 2
1.4.	DISCIPLINE MICROBIOLOGY-VIROLOGY
1.5.	DOMAIN OF STUDY: HEALTH – Sectorally regulated within the European Union
1.6.	STUDY CYCLE: LICENCE
1.7.	STUDY PROGRAME: MEDICINE – ENGLISH MODULE

2. 2. Data about discipline

2.1.	Name of the discipline in the educational plan: VIROLOGY				
2.2.	Discipline code: M098 4				
2.3.	Discipline type (FD/SD/CD): DF				
2.4.	Discipline regimen (MD/OPD/):MD				
2.5.	The holder of the course activities Prof. Dr. Simona Ruta Assoc. Prof. Dr. Camelia Sultana Assoc. Prof. Dr. Cornel Popescu Dr. Aura Temereanca				
2.6.	The holder of the seminar activities : Assoc. Prof. Conf Dr Cornel Popescu Dr Aura Temereanca Dr Stefania Marineata Dr Simona Paraschiv Dr Simona Mihai Dr Ana Iulia Neagu Dr Diana Gabriela Iacob Dr Adrian Paun (determined period)				
2.7. Year of study	3	2.8. Semester	5 and 6	2.9. Type of evaluation (E/C)	E

3. Total estimated time (hours/semester of didactic activity an self preparation/study

I. Academic training (teaching, practical application, assessment)						
3.1. Nr hours/week	4	From which:	3.2. lecture	2	3.3. seminary/ laboratory	2
3.4. Total hours of educational plan	56	From which:	3.5. lecture	28	3.6. seminary/ laboratory	28
Evaluation (nr. of hours) : 7						
II. Self preparation/study						
Time allocation						hours

Study of course materials, textbooks, books, study of the recommended minimal bibliography	20
Additional research in the library, research through the internet	10
Performing specific activities for preparing projects, laboratories, elaborating reviews or other tasks	10
Specific preparation activities for projects, laboratory work, assignments, and reports	10
Tutoring	10
Other activities	4
3.7. Total individual study hours	64
3.9. Total hours per semester (3.4.+ 3.7.)	120
3.10. Number of credits	4

4. Preconditions (where applicable)

4.1. of curriculum	no
4.2. of competences	no

5. Conditions (where applicable)

5.1. to conduct the lecture	Multimedia Projector, videoprojector, laptop
5.2. to conduct the seminar / laboratory	Light microscope, inverted microscope, cell cultures, ELISA, spectrophotometer, termocycler, electroforesis system, reagents, adjustable serological pipettes, multimedia projector, videoprojector, laptop

6. Learning outcomes

Knowledge	Skills	Responsibility and autonomy
The student / graduate is capable of: - Description of concepts and theories regarding the viral replication and structure of the viruses - Understanding the pathogenic mechanisms implied in viral infections -Description of mechanisms of antiviral drugs, indications, contraindications, and adverse effects of the antivirals used in medical practice	The student / graduate is capable of a correct: - Assessment of the appropriate active prophylaxis in viral infections (vaccination) / passive prophylaxis in viral infections (immunotherapy) -Evaluation of optimal directions of virological diagnosis, interpretation of results, establishment of an algorithm for monitoring and prediction of natural evolution and treatment of viral diseases	The student/ graduate is capable to: - Establish the objectives to be achieved, the available resources, the conditions for their completion, the working stages, the working times, the related deadlines and the related risks in the diagnosis of the main viral syndromes -Identify the roles and responsibilities in a multidisciplinary team, and applying effective networking techniques within the team - to use the information sources and resources of communication and assisted training (Internet portals, specialized software applications, databases, online courses, etc.), both in Romanian and in a language of international circulation

7. Course objectives (aligned with the learning outcomes)

7.1. General objective	- Gaining the ability to understand and apply fundamental notions about viral replication, the pathogeny of viral infections, mechanisms of action of antiviral drugs, methods of correct virological diagnosis in the main viral syndromes - Decide the implications of viral diseases in the community and in the medical system.
7.2. Specific objective	Students will be able to use the optimal virological methods in specific pathologies, interpret biomarkers for monitoring and predict the natural and on treatment evolution of viral diseases. Establishing a good and effective communication relationship between doctor and patient/doctor-family/participants in explaining the results of virological diagnosis and in applying antiviral vaccines as a method of preventing viral syndromes

8. Contents

8.1. Course	Teaching methods	Observations
Course 1. Viral structure. Virus replication; Identification of virus families associated with different DNA and RNA virus replication schemes Viral pathogenesis; viral persistence; viral genetics	Interactive exposure of the material according to the analytical program, using powerpoint presentations and didactic films.	2 hours/lecture
Course 2. Immunity in viral infections; humoral and cellular immune response, MHC role in viral infections; viral strategies of eluding the immune response Interferon's: mechanism of action and biological effects	Interactive exposure of the material according to the analytical program, using powerpoint presentations and didactic films.	2 hours/lecture
Course 3. Viral vaccines: modalities of obtaining the vaccines, viral attenuated vaccines, inactivated vaccines, advantages and disadvantages. Smallpox eradication and emerging Poxviruses (Monkeypox). New technologies for to the development of the vaccines: vaccines using viral vectors and mRNA vaccines	Interactive exposure of the material according to the analytical program, using powerpoint presentations and didactic films.	2 hours/lecture
Course 4. Orthomixoviridae: influenza viruses; pandemic and epidemic strains. Variability of influenza viruses; vaccines. Avian flu.	Interactive exposure of the material according to the analytical program, using powerpoint presentations and didactic films.	2 hours/lecture

Course 5. Paramixoviridae: Structure and properties of measles, mumps, parainfluenza and respiratory syncytial viruses.	Interactive exposure of the material according to the analytical program, using powerpoint presentations and didactic films.	2 hours/lecture
Course 6. Herpesviridae: The structure of herpes viruses. Herpes simplex types 1 and 2, varicella-zoster virus, Cytomegalovirus, Epstein-Barr virus; Human herpes virus 8 and other herpes types specific antiviral for herpes viruses infections. Rotaviruses and other agents of viral gastroenteritis	Interactive exposure of the material according to the analytical program, using powerpoint presentations and didactic films.	2 hours/lecture
Course 7. Neurovirosis. Main viruses implicated in meningitis and encephalitis	Interactive exposure of the material according to the analytical program, using powerpoint presentations and didactic films.	2 hours/lecture
8. HIV/AIDS (I). Retroviridae family. Structure of HIV. Replicative cycle- receptors and co receptors. Mechanisms of variability.	Interactive exposure of the material according to the analytical program, using powerpoint presentations and didactic films.	2 hours/lecture
9. HIV/AIDS (II). Evolution of HIV/AIDS infection in adults and children. Antiretrovirals. Combined therapy. Mechanisms of antiretroviral action. Prevention of HIV transmission.	Interactive exposure of the material according to the analytical program, using powerpoint presentations and didactic films.	2 hours/lecture
10. Hepatitis viruses (1): Hepatitis A, B, C, Delta, and E. Recently identified viral hepatitis.	Interactive exposure of the material according to the analytical program, using powerpoint presentations and didactic films.	2 hours/lecture
11. Hepatitis viruses (2): Chronic hepatitis B and C. Markers for monitoring the evolution and treatment of chronic hepatitis B and C.	Interactive exposure of the material according to the analytical program, using powerpoint presentations and didactic films.	2 hours/lecture
12. Human Papillomaviruses umane. Lithic infection versus persistent infection. High-risk oncogenic genotypes. Human papillomaviruses in cervical carcinoma. HPV vaccination	Interactive exposure of the material according to the analytical program, using powerpoint presentations and didactic films.	2 hours/lecture
13. Oncogenic viruses. Oncogenes, antioncogenes, tumor suppressor genes. Mechanism of viral oncogenesis DNA cancer viruses (polyoma, herpes, papilloma,	Interactive exposure of the material according to the analytical program, using powerpoint presentations and didactic films.	2 hours/lecture

hepatitis, adenovirus). RNA oncogenic viruses (retroviruses).		
14. Emergent viral infections: Highly pathogenic coronaviruses: SARS CoV, MERS, SARS CoV-2. Vaccines approved for prevention of SARS CoV-2. Viral hemorrhagic fever: Filoviridae; Swine and Avian influenza. Arboviruses: Flavi- and Bunyaviridae encephalitis	Interactive exposure of the material according to the analytical program, using powerpoint presentations and didactic films.	2 hours/lecture
8.2. Laboratory/ practical lesson	Teaching methods	Observations
1. The algorithm of the operations implied in viral diagnose. Choosing the samples for viral diagnose. Collecting, labeling and transport of biological samples	Practical and theoretical applications (power point presentations, biological samples, biochemical techniques, computer simulations, functional tests). Interactive learning. Use of multimedia, didactic films, presentations of bulletins of analysis, discussion with students.	2 hours/practical class
2. Cell cultures: Classification of cell cultures. Protocol of maintaining a stationary cell culture; Protocol of viral isolation on cell cultures. Types of Cytopathic effects. Examples	Practical and theoretical applications (power point presentations, biological samples, biochemical techniques, computer simulations, functional tests). Interactive learning. Use of multimedia, didactic films, presentations of bulletins of analysis, discussion with students.	2 hours/practical class
3. Seroneutralisation reaction. Isolation of viruses on the laboratory animal.	Practical and theoretical applications (power point presentations, biological samples, biochemical techniques, computer simulations, functional tests). Interactive learning. Use of multimedia, didactic films, presentations of bulletins of analysis, discussion with students.	2 hours/practical class
4. Plaques method and calculation of PFU (plaque forming units)	Practical and theoretical applications (power point presentations, biological samples, biochemical techniques, computer simulations, functional tests). Interactive learning. Use of multimedia, didactic films, presentations of bulletins of analysis, discussion with students.	2 hours/practical class
5. Laboratory diagnose in viral influenza infections: Haemagglutination test and haemagglutination inhibition tests. Viral isolation on embrionated egg.	Practical and theoretical applications (power point presentations, biological samples, biochemical techniques, computer simulations, functional tests). Interactive learning. Use of multimedia, didactic films, presentations of bulletins of analysis, discussion with students.	2 hours/practical class
6. Laboratory diagnose in Herpesvirus infections	Practical and theoretical applications (power point presentations, biological samples, biochemical techniques, computer simulations, functional tests).	2 hours/practical class

	Interactive learning. Use of multimedia, didactic films, presentations of bulletins of analysis, discussion with students.	
7. Diagnose in viral neuroviroses: viral meningitis and encephalitis	Practical and theoretical applications (power point presentations, biological samples, biochemical techniques, computer simulations, functional tests). Interactive learning. Use of multimedia, didactic films, presentations of bulletins of analysis, discussion with students.	2 hours/practical class
8. Diagnose of HIV/AIDS: Serological techniques for seeing and confirmation: ELISA, Western Blot (WB). Techniques of viral particle detection and viral parts detection.	Practical and theoretical applications (power point presentations, biological samples, biochemical techniques, computer simulations, functional tests). Interactive learning. Use of multimedia, didactic films, presentations of bulletins of analysis, discussion with students.	2 hours/practical class
9. Diagnose of HIV/AIDS Molecular diagnose. (PCR, Rt-PCR, real time PCR, nucleotide sequencing)	Practical and theoretical applications (power point presentations, biological samples, biochemical techniques, computer simulations, functional tests). Interactive learning. Use of multimedia, didactic films, presentations of bulletins of analysis, discussion with students.	2 hours/practical class
10. Laboratory diagnose in viral hepatitis (I): Diagnose of hepatitis B and D: Methods of HBs Ag detection. Markers of HBV infectivity. Diagnose of hepatitis D.	Practical and theoretical applications (power point presentations, biological samples, biochemical techniques, computer simulations, functional tests). Interactive learning. Use of multimedia, didactic films, presentations of bulletins of analysis, discussion with students.	2 hours/practical class
11. Laboratory diagnose in viral hepatitis (II): Diagnose of hepatitis C: Serological tests: ELISA, RIBA. Clinical cases	Practical and theoretical applications (power point presentations, biological samples, biochemical techniques, computer simulations, functional tests). Interactive learning. Use of multimedia, didactic films, presentations of bulletins of analysis, discussion with students.	2 hours/practical class
12. Laboratory diagnose in viral hepatitis with parenteral transmission. Diagnose of hepatitis A and E	Practical and theoretical applications (power point presentations, biological samples, biochemical techniques, computer simulations, functional tests). Interactive learning. Use of multimedia, didactic films, presentations of bulletins of analysis, discussion with students.	2 hours/practical class
13. Laboratory molecular diagnose in HPV infection. Screening tests for HPV infection; Molecular tests for evaluating HPV-DNA and detection of HPV genotypes.	Practical and theoretical applications (power point presentations, biological samples, biochemical techniques, computer simulations, functional tests). Interactive learning. Use of multimedia,	2 hours/practical class

	didactic films, presentations of bulletins of analysis, discussion with students.	
14. Algorithm for the diagnosis of an unknown outbreak.	Practical and theoretical applications (power point presentations, biological samples, biochemical techniques, computer simulations, functional tests). Interactive learning. Use of multimedia, didactic films, presentations of bulletins of analysis, discussion with students	2 hours/practical class
Recent Bibliography "Virusologie Medicala"- C. Cernescu, Ed. Medicala, 2008 "Curs concis de virusologie" C. Cernescu, S.M. Ruta Editura Universitara "Carol Davila", 2003 "SIDA - Tratamentul cu antiretrovirale"- C. Cernescu, S. Ruta Ed. Concept publishing, 1998, capitole- 5, 6, 7. "Medicamente antivirale-2003, C. Cernescu, S.M. Ruta Editura Universitara "Carol Davila", 2003. "Progrese in controlul si prevenirea virozelor cu potential bioterorist", C. Cernescu, S.M. Ruta Editura Universitara "Carol Davila", 2004. "Practica diagnosticului virusologic", C. Cernescu, S. Ruta, Ed. Concept publishing, 1997 Fields Virology, Knipe M David (eds) a 5-a editie, editura Walters Kluwer Lippincot Williams, 2007		

9. Evaluation

Activity type	9.1. Evaluation criteria	9.2. Evaluation methods	9.3. Percentage in the final grade
9.4. Lecture	Attendance at the classes, participation to the activities, clinical cases presentations, partial evaluations	Written Exam	80%
9.5. Seminary/ practical activity	Attendance at the classes, participation to the activities, clinical cases presentations, partial evaluations	Evaluation during the semester and Practical Exam, Clinical Cases presentations	15%
9.5.1. Individual project (if applicable)	Clinical Cases presentations	Presentations	5%
9.6. Minimum performance standard : Minimum grade is five at Virology exam. Minimum performance standard is 50% for the practical exam and the written examination. Both, practical and final exam represent elimination tests.			

Date of completion : **Signature of the course holder** **Signature of the laboratory holder**

30.09.2025