Nr. ieșire: 59/14.05.2021
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DETAILED CURRICULUM

1. Data about the program

1.1.	**CAROL DAVILA UNIVERSITY OF MEDICINE AND PHARMACY**
1.2.	**FACULTY OF MEDICINE / CLINICAL DEPARTMENT 2**
1.3.	**DISCIPLINE: VIROLOGY**
1.4.	**FIELD OF STUDY: HEALTH - Sectoral regulation in the EU**
1.5.	**STUDY CYCLE: LICENSE**
1.6.	**CURRICULUM: MEDICINE**

2. Data about the discipline

2.1.	**Discipline name: VIROLOGY**
2.2.	**Course activities coordinator:** **Dr Simona Ruta, 53 ys, Professor** **Dr Camelia Sultana, 53 ys, Associate Professor**
2.3.	**Seminar activities holder:** **Dr Aura Temereanca, 46 ys, Assistant Professor** **Dr Stefania Marineata, 51 ys, Assistant Professor** **Dr Adelina Rosca, 35 ys, Assistant Professor** **Dr Cornel Popescu, 47 ys, Assistant Professor** **Dr Carmen Cristescu, 35 ys, Assistant Professor** **Dr Paraschiv Simona, 42 ys, Assistant Professor**

2.4. Anul de studiu	**III**	**2.5. Semester**	5 and 6	**2.6. Type of evaluation**	**Exam (theroretical and practical)**	**2.7. Type of discipline**	**Mandatory**

3. Estimated total time (hours/semester didactic activity)

Hours / week	**4**	**Lecture:**	**2**	**Practical classes**	**2**
Total hours of learning schedule	**56**	**Lecture:**	**28**	**Practical classes**	**28**
Distribution of time	**14 weeks**		hours		hours
Textbook study, lecture support, bibliography and notes					
Supplementary documentation (in the library, online field)					
Preparing for seminary/lab, homework					
Tutoring					
Examination					
Other activities					
Total hrs. individual study					
Credits					**4 credits**

4. Preconditions (where needed)

4.1. curriculum	not required
4.2. compétences	not required

5. Conditions (where needed)

5.1. for lectures	Multimedia Projector, videoprojector, laptop	-
5.2. for practical classes	Light microscope, inverted microscope, cell cultures, ELISA , spectrofotometer, termocycler, elecroforesis system, reagents,adjustable serological pipettes, multimedia projector, videoprojector, laptop	-

6. Specific accumulated competences

Professional skills (as knowledge and abilities)	-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 -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
Transversal competences (role, professional and personal development)	-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 -Identifying the roles and responsibilities in a multidisciplinary team, and applying effective networking techniques within the team -Efficient use of 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. Discipline objectives (from the specific competences grid)

7.1. General objective	- 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 - Distinguish the implications of viral diseases in the community and in the medical system.
7.2. Specific objectives	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. Content

8.1. Lecture	**Teaching methods**	**Observations**
1. **Viral structure, viral taxonomy**; Virus replication strategies; Identification of virus prototypes 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
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
3. Viral vaccines: modalities of obtaining the vaccines, viral attenuated vaccines, inactivated vaccines, advantages and disadvantages. Molecular approaches to the development of viral vaccines; New approaches to the development of new vaccines: subunit vaccines, anti-idiotype RNA and DNA vaccines	Interactive exposure of the material according to the analytical program, using powerpoint presentations and didactic films.	2 hours/lecture
4. **Orthomixoviridae:** influenza viruses; pandemic and epidemic strains. Laboratory diagnosis. 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
5. **Paramixoviridae**: Structure	Interactive exposure of the material	2 hours/lecture

and properties of measles, mumps, Para influenza and respiratory syncitial viruses.	according to the analytical program, using powerpoint presentations and didactic films.	
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
7. **Neurovirosis.** Picornaviridae: poliomyelitis viruses. Differences between attenuated and virulent polio strains, Anti-polio vaccines. Other 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).** Virus Structure. Replicative cycle-receptors and co receptors. Mechanisms of variability. Natural clinical evolution of HIV/AIDS infection in adults and children. Rapid progressors and long-term survivors. Laboratory diagnosis.	Interactive exposure of the material according to the analytical program, using powerpoint presentations and didactic films.	2 hours/lecture
9. **HIV/AIDS (II).** Antiretrovirals. Reverstranscriptase inhibitors; protease inhibitors; integrase inhibitors; CCR5 and fusion inhibitors. Combined therapy. Mechanisms of antiretroviral resistance. The effect of antiretroviral in other viral infections	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, Laboratory diagnosis of acute viral hepatitis. Chronic hepatitis B. Markers for monitoring the evolution and treatment of chronic hepatitis.	Interactive exposure of the material according to the analytical program, using powerpoint presentations and didactic films.	2 hours/lecture
11. **Hepatitis viruses (2):** Hepatitis C, Delta, E. Chronicle hepatitis C. Recently identified.	Interactive exposure of the material according to the analytical program, using powerpoint presentations and	2 hours/lecture

hepatitis viruses. Hepatic carcinoma of viral etiology.	didactic films.	
12. **Human Papilomaviruses 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, hepatitis, adenovirus). RNA cancer viruses (retroviruses). Possibilities of vaccination in carcinoma of viral etiology	Interactive exposure of the material according to the analytical program, using powerpoint presentations and didactic films.	2 hours/lecture
14. **Emergent viral infections:** The reasons for viral diseases emergence. Highly pathogenic coronaviruses: SARS CoV, MERS, and SARS CoV-2. Arboviruses: Flavi si Bunyaviridae arbovirus encephalitis, febrile and hemorrhagic disease. Rodent borne hemorrhagic fever, hemorrhagic fever with renal syndrome and hantavirus pulmonary syndrome. Viral hemorrhagic fever: Filoviridae; Swine and Avian influenza;. Prion diseases: Kuru, Creutzfeld-Jakob disease; Preventing viral infections with bioterrorist potential.	Interactive exposure of the material according to the analytical program, using powerpoint presentations and didactic films.	2 hours/lecture
8.2. Practical Classes	**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,	2 hours/practical class

	presentations of bulletins of analysis, discussion with students.	
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. **Laboratory diagnose of eruptive fever.** Plaques method; Immunofluorescence tests.	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 respiratory 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 sexual transmitted diseases**. Herpesviruses.	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
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	2 hours/practical class

	analysis, discussion with students.	
8. Diagnose of HIV/AIDS: Serological techniques of screening 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. **Molecular diagnose.** PCR. Detection of HIV infection within the serological window, in newborn from sero-positive mothers, detection of viral load and monitoring of treatment.	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 A and B: Methods of HBs Ag detection. Markers of HBV infectivity.	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. Diagnose of hepatitis D. D. 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. Diagnosticul de laborator în hepatitele virale cu transmitere enterica. Algoritmul diagnosticului hepatitei A si 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. Algoritmul de screening HPV; Diagnosticul molecular ADN-HPV si determinarea genotipurilor	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

14. Algorithm for the diagnostis 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

Bibliography for lectures and practical classes

"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 Kluweer Lippincot Williams, 2007

9. Correlation between department activity and expectation of epistemic community members, professional associations and employers in representative fields

Professional training of the third-year student in the Virology Discipline follows three main coordinates: correct virological diagnosis and monitoring of therapeutic schemes, understanding the significance of the results of virological diagnosis, and preparation of the future doctor in order to communicate well /adequately with the future employer (including notions of legislation in the field, professional ethics, methodology of scientific research)
The course and practical classes are consistent to the general training required by a doctor at graduation and are related to the Curriculum of training in residency (medical microbiology, infectious diseases, epidemiology)

10. Evaluation

3. Activity type	**8.1. Evaluation criteria** Attendance at the practical classes, involvement in the activities, clinical cases presentations, partial evaluations	**8.2. Methods of evaluation** **EXAM**	**8.3. percentage (%) out of final grade**
Lecture		Written Exam	**70%**
		Clinical Cases presentations	**10%**
		Evaluation during the semester and Practical Exam	**20%**
Minimum performance standards			

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:
12.04.2021

Course titular
Signature

Prof. dr Simona Ruta

Conf. dr Camelia Sultana

Practical classes titular
Signature

Dr Aura Temereanca

Dr Stefania Marineata

Dr Adelina Rosca

Dr Cornel Popescu

Dr Simona Paraschiv

Dr Carmen Cristescu

Date

Department Director
Signature

Prof. Dr. Adrian Streinu-Cercel