



Department of Biology

College of Education

Salahaddin University

Subject: General Virology

Course Book – (Year: 4)

Lecturer's name: Assist. Prof. Dr. Sazan Qadir

Maulud

Academic Year: 2023-2024

Course Book

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| 1. Course name | General Virology |
| 2. Lecturer in charge | Sazan Qadir Maulud |
| 3. Department/ College | Biology Dept./ College of Education |
| 4. Contact | e-mail: sazan.maulud@su.edu.krd Tel: +964 7504687617 |
| 5. Time (in hours) per week | Theory: 4 hrs practice: 2 hrs |
| 6. Office hours | Approximately 6 Hours per week |
| 7. Course code | EdB0409 |
| 8. Teacher's academic profile | <p>-MSc in Microbiology, University of Salahaddin, College of Education, Biology Dept. 2003-2006</p> <p>Thesis Title: The Effect of Some Medicinal Plant Extracts on Curing Plasmids of <i>Klebsiella pneumoniae</i> Isolated From Different Environments</p> <p>-PhD in Molecular Virology, University of Salahaddin, Education College, Biology Dept. 2009-2014</p> <p>Thesis Title: Molecular Diagnosis of <i>Herpes simplex virus type-2</i> and Use of the Viral UL43, UL35, and ICP22 Proteins as a Candidate for Vaccine Development</p> <p>-Employment History</p> <p>-2000 B.Sc. in Biology, University of Salahaddin, Biology Dept. First at college.</p> <p>-2001 Date of first appointment in Salahaddin University – Biology Dept.</p> <p>-2006 Assist. Lecturer in Salahaddin University- Biology Dept.</p> <p>-2014 Lecturer in Salahaddin University- Biology Dept.</p> <p>-Publications</p> |

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| | <p>- Khider, A.K. and Maulud, S.Q. "Potential of Aqueous Extracts of <i>Allium sativum</i>, <i>Mentha spicata</i>, <i>Myrtus communis</i> and <i>Thymus vulgaris</i> as Antimicrobials and Curing of Antibiotic Resistant Genes in <i>Klebsiella pneumoniae</i>. Journal of Academia, volume 2, 16-26, 2012.</p> <p>- Khadija kh Mustafa, Sazan Q. M., Pshteewan A. H. "Detection of <i>Sphingomonas paucimobilis</i> and antibacterial activity of <i>Prosopis farcta</i> extracts on it". Karbala International Journal of Modern Science, (2017).</p> <p>- Dlshad A. H., Sazan Q. M., Rastee H.S., Beston F. N. "Seroprevalence and Genotypic Distribution Patterns of Hepatitis C Virus among Infected Patients from Erbil Province: Kurdistan/Iraq" Diyala Journal of Medicine, Vol.14.Issue 1, April 2018</p> <p>-Skills and Qualifications:</p> <p>Computer skill: Microsoft Office (Windows, Word, Excel, PowerPoint), using Email and Internet</p> <p>Language: Kurdish, Arabic, English</p> <p>-Main Teaching Areas</p> <p>Microbiology, Pathogenic Bacteria, Mycology, Virology, Molecular Biology</p> <p>-Activities Performed During my Attendance in University:-</p> <ol style="list-style-type: none">1. Preparation of seminar before graduation from university.2. Preparation of MSc Research under supervision of Dr. Adel Kamal Khdir /Professor in Microbiology. (Salahaddin Univ.) <p>Evaluation: very Good.</p> <ol style="list-style-type: none">3-Training Course of English Language in 20094- Training Course of Computer in Computer Dep.2009.5- Teaching Method training 2009. |
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| | <p>6-Tissue culture workshop 2010, Faculty of Health and Science/ Koya University.</p> <p>7- GelDoc-It®2 Imager workshop 2012, Faculty of Health and Science/ Koya University.</p> <p>8- End note work shop 2013, biology Dep.</p> <p>9-Preparation of PhD Research under supervision of Dr. Muyad Ibrahim Sawa/Professor in Virology, and Dr. Shwan Kamal Rachid /Professor in Molecular Infection. (Koya Univ.) Evaluation: Excellent.</p> <p>10.SPSS workshop 2016, in Computer Department-college of Education/Salahaddin University</p> |
| 9. Keywords | General Virology, academic profile, course book |
| <p>10. Course overview:</p> <p>Virology is a fascinating and rapidly developing subject, and is worthy of study purely because viruses are interesting! Furthermore, virology is a branch of science that is of immense relevance to mankind for a host of reasons, not least of which the threats to human health are caused by viruses, such as HIV, hepatitis B virus, papillomaviruses, measles and influenza viruses, to mention just a few. Evidence for the existence of very small infectious agents was first provided in the late 19th century by two scientists working independently: Martinus Beijerinck in Holland and Dimitri Ivanovski in Russia. Beijerinck called the agent a 'virus' and the term has been in use ever since. Viruses are the smallest infectious agents (ranging from about 20 nm to about 300 nm in diameter) and contain only one kind of nucleic acid (RNA or DNA) as their genome.</p> <p>This course provides an introduction to the field of virology. The course emphasizes the intrinsic properties of viruses that cause human disease and their interaction with cells, their structure, classification and evolution, their ways to infect and exploit host cells for virus reproduction, their interaction with host organism physiology and immunity, the diseases they cause, the techniques to isolate and culture them, and their use in research and therapy. Virology is considered to be a subfield of microbiology.</p> | |
| <p>11. Course objective:</p> | |

This course is designed for undergraduate students who are learning about virology for the first time. The purpose of this course is to provide a foundation for the understanding of viruses that cause human disease. The objective of the Science of Virology course is to describe at the molecular level the replication strategies of representative DNA and RNA viruses and the effects of virus infection on cell growth control and survival. Emphasis is placed on developing an understanding of the experimental systems used to elucidate individual steps in virus life cycles and their interactions with host cells. Host cell-virus interactions leading to production of progeny virus and interactions involved in establishing and maintaining long term interactions, such as latency and oncogenesis. Also present the historical perspectives of virology, to introduce the idea that viruses whether pathogenic or benign are important members of the biosphere and have an important impact on our daily and future activities.

12. Student's obligation

Students are expected to attend all classes. The official college attendance policy is followed. Attendance in each class is counted from the first day the student is eligible to attend the class as given on the student's assessment sheet registration card or student change notice. Student may obtain an excuse for the emergency absence from the dean of students upon presentation of satisfactory documentation.

13. Forms of teaching

1- Different forms of teaching will be used to reach the objectives of the course: power point presentations, definitions and description images, summary of conclusions, classification of materials and any other illustrations, besides worksheet will be designed to let the chance for practicing on several aspects of the course in the classroom.

2-Using white board

3-Classroom discussions about the lecture subjects and student questions.

14. Assessment scheme

1. The students are required to do two closed book exams during the academic year.
2. Weekly quiz.
3. Attendance
4. Comprehensive final examination equal to

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| Exam1 | 40% |
| Exam2 | 40% |
| Homework/ Reports/ Quizzes /Discussion/attendance as assigned | 20% |
| Total | 100% |

15. Student learning outcome:

This course will provide a comparative overview of virus life cycles and strategies viruses use to infect and replicate in hosts. We will discuss virus structure and classification and the molecular basis of viral reproduction, evolution, assembly, and virus-host interactions.

In the end of the course, it expects the students will be able to:

- 1- Define common terms used in virology and the history of virology.
- 2- Identify all the possible methods for diagnosis of virus, the special techniques by which we can replicate viruses, laboratory diagnosis of viruses using different techniques (such as: Molecular, immunological etc..)
- 3-Identify International classification of viruses; know the taxonomy of human viruses that cause disease
- 4-Understanding the main and new emerging threats of viral diseases eg. HIV, influenza
- 5- How to combat viral infections.
- 6- Understanding the relationships between virus and the other Kingdoms.
- 7- Compare different virus replication strategies and genome coding strategies
- 8- Have good knowledge of the prevention, control and eradication of viral diseases
- 9- Think critically in terms of their learning and research.

16. Course Reading List and References

1. Fundamentals of Molecular Virology, 2nd Edition by Nicholas H. Acheson, John Wiley & Sons, Inc. 2011
- 2- "Principles of Virology" Flint S.J., Enquist L.W., Racaniello V.R., Skalka A.M. 2008, 3rd edition, ASM Press.
- 3-"Fields Virology" David M. Knipe, PhD, Peter M. Howley, MD, Diane E Griffin MD, PhD, Robert A Lamb, PhD, ScD, Malcolm A Martin MD, Bernard Roizman ScD, and Stephen E Straus, MD. 2007, 5th edition, Lippincott Williams & Wilkins.

4-“Basic Virology” Edward K. Wagner, Martínez J. Hewlett, David C. Bloom, David Camerini.2007, 3rd edition, Wiley-Blackwell.

5-“Introduction to Modern Virology” N.J. Dimmock, A.J. Easton, K.N. Leppard. 2007, 6th edition, Wiley-Blackwell.

6- “Understanding viruses” Teri Shors. 2nd ed. Burlington: Jones & Bartlett Learning, cop. 2013.

| 17. The Topics | Lecture Date |
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| <p>Week 1: -Introduction and General characters of viruses (History, definition, and importance of study)</p> <p>-Viral structure</p> <p>Virus structure and morphology</p> <p>composition and function of viral structure</p> | 2 hours |
| <p>Week 2: Virus Architecture and Nomenclature</p> <p>Viral shape (Symmetry) and different figure of virus</p> <p>Classification of Animal Viruses (ICV and Baltimore scheme)</p> | 2 hours |
| <p>Week 3: Virus replication Strategies</p> <p>Principal events involved in replication: Adsorption, penetration, uncoating nucleic acid and protein synthesis, assembly, maturation and release.</p> | 2 hours |
| <p>Week 4: Chemical and physical agent reaction</p> <p>To discuss the effect of pH, temperature, Heat, cold and salts upon Viral activities.</p> <p>-Viral Immunopathology-Viral Immune response and viral evasion Mechanisms</p> | 2 hours |
| <p>Week 5: Laboratory Diagnosis of Virus Infections (Method of Diagnosis)</p> <p>-Direct method</p> <p>-In Direct method</p> <p>-Serological and molecular method</p> | 2 hours |

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| Week 6 : Double stranded DNA Virus (Adenoviruses, Herpesviruses, Poxviruses) | 2 hours |
| Week 7 : Single strand DNA viruses (+ sense) DNA (e.g., Parvoviruses) | 2 hours |
| Week 8 : Positive single strand (+)ssRNA viruses (+ sense) RNA (e.g. Picornaviruses, Togaviruses) | 2 hours |
| Week 9 : Double strand RNA viruses (e.g., Reoviruses) | 2 hours |
| Week 10 : Negative single strand (-)ssRNA viruses (- antisense) RNA (e.g. Orthomyxoviruses, Rhabdoviruses) | 2 hours |
| Week 11 : Single strand RNA-RT viruses (+ sense) RNA with DNA intermediate in life-cycle (e.g. Retroviruses) | 2 hours |
| Week 12 : Double strand DNA-RT viruses (e.g., Hepadnaviruses) | 2 hours |
| Week 13 : Viral Persistence: Chronic & Latent Virus Infections, Effect of Host Age. | 2 hours |
| Week 14 : Antiviral Chemotherapy, Viral Vaccines. | 2 hours |
| Week 15 : Viral Evasion Mechanism | 2 hours |
| 19. Examinations: | |
| 1. Complete the following blanks. | |
| 2. True or false. | |
| 3. Multiple choices. | |
| 4. Match the tow following columns. | |
| 5-Count the following. | |
| 6-Explain or discuss or mention the following. | |

7-Write about the following.

8- Draw and Label.

9- Write the differences between the following

10- Count only with example