

Al al-Bayt University
Dept. of Biological Sciences
Summer, 2019

Virology (404339)

Instructor:

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Office hours:

Course description:

This Virology course is aimed at undergraduates students to provide a contemporary understanding of how viruses are built, how they infect and replicate in host cells, how they spread, evolve and cause disease, and how infection of a host can be prevented. This course will provide a balanced approach to virology, combining the molecular and clinical aspects of virology. While it is focused on human and animal viruses, it will also discuss bacteriophages and plant viruses, as well as unusual virus-like agents (prions, viroids, etc.). In addition to traditional topics, this course will explain new “hot” trends in Virology, including virus-based gene therapy; modern advances in vaccinology; “oncolytic” viruses to treat cancers; emerging viruses and their use in nanotechnology.

Course Goals:

At the end of this module, student will be able to:

- Differentiate the nature of viruses as particles or structures
- Describe the structure and function of viruses
- Describe the role of viruses in aiding our understanding of basic biological principles.
- Distinguish diverse characteristics of viruses – host range, target tissues, replication strategy, transmission, etc.
- Explain the various techniques for detecting and treating viral diseases
- Develop an awareness of the impact of viruses on society.
- Understanding the main and new emerging threats of viral diseases eg. HIV , influenza and Ebola
- Application of Viruses to Nanotechnology

Course outcomes

- List viruses that infect humans and cause disease
- Describe virus-cell interactions & pathogenesis of disease
- Explain molecular mechanisms of virus infection
- Discuss the tool used in the study of viruses
- Update information on emerging viruses
- Describe current state of HIV infection
- Define viruses associated with malignant tumours in human
- Describe the role of viruses in the community
- Explain how infectious is a virus
- Define controlling of virus disease by immunization: Vaccination
- Perform basic virology techniques (serology)

DISCUSSION SECTION

This section is intended to stimulate interest in viruses and the roles they play in our lives. We will view some informative films and discuss various human interest and hot topics. The weeks that “Viruses in the News” appears, you should come prepared with current topics in the media, newspapers, journals, etc. and bring these to class for discussion. There are 2 discussion sessions in which we will break into small groups to evaluate Case Studies of various viral outbreaks. You will earn points for participating in these case study activities.

GRADING

The final grade will be based on three exams and participation.

Exams: They will consist of multiple-choice questions and probably some short-answer essay-type questions covering the material since the previous exam.

Grading:

First exam	20%
Second exam	20%
Participation	10 %
Final exam	50 %

Course/ module components

week	Basic and support material to be covered
1	Introduction : course syllabus, assignment & literature review
	Introduction to viruses
	Virus structure and classification
2	Virus infectious cycle
	Mechanisms of Capsid Self-Assembly
	The infectious cycles
3	Genome and Genetics
	Viral Structure
	Attachment and Entry
4	RNA directed RNA Synthesis
	Viral DNA Replication
5	viruses in the news, HIV
	Viroid's
	Prions
6	Acute and Persistent Infections
	Vaccines
	Antiviral
7 & 8	Emerging viruses (HIV, H5N1, Ebola)
	Application of Viruses ()

*This syllabus is subject to change at anytime.

Attendance policy:

Absence from lectures shall not exceed 15%. Students who exceed the 15% limit without a medical or emergency excuse acceptable to and approved by the Dean of the faculty of science shall not be allowed to take the final examination and shall receive a mark of zero for the course.