



# Course Specifications

**Revised November 2019**

<b>Course Title:</b>	<b>Virology</b>
<b>Course Code:</b>	<b>4012412-2</b>
<b>Program:</b>	<b>BSc Microbiology</b>
<b>Department:</b>	<b>Department of Biology</b>
<b>College:</b>	<b>Faculty of Applied Science</b>
<b>Institution:</b>	<b>UM AL – QURA UNIVERSITY</b>
<b>Revision Date</b>	<b>November 2019</b>

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## A. Course Identification

<b>1. Credit hours:</b> <b>3 hours</b>
<b>2. Course type</b>
a. University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Others <input type="checkbox"/>
b. Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/>
<b>3. Level/year at which this course is offered:</b> <b>2<sup>nd</sup> Year / Level 4</b>
<b>4. Pre-requisites for this course (if any):</b> <b>Introductory Microbiology 4012401-4</b>
<b>5. Co-requisites for this course (if any):</b>

### 6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	30	50 %
2	Blended		-
3	E-learning		-
4	Correspondence		-
5	Other	30	50 %

### 7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
<b>Contact Hours</b>		
1	Lecture	30
2	Laboratory/Studio	-
3	Tutorial	-
4	Practical/Field work/Internship	6
5	Others (specify)	30
	<b>Total</b>	<b>66</b>
<b>Other Learning Hours*</b>		
1	Study	30
2	Assignments	8
3	Library	15
4	Projects/Research Essays/Theses	10
5	Others (specify)	-
	<b>Total</b>	<b>63</b>

\* The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

## B. Course Objectives and Learning Outcomes

### 1. Course Description

This course is designed for students in applied microbiology and general biology which covers an introduction to the field of virology and examines the important aspect and fundamentals of Virology including, virus structure, viral replication cycles, virus classification, architecture and nomenclature, laboratory diagnosis of virus, how viruses enter and spread in the host cells, host resistance to viruses and viral epidemiology.

### 2. Course Main Objective

❖ **After completing this course student should be able to:**

1. Review the history and principles of virology.
2. List the general properties of viruses
3. Write the different types of viruses
4. Describe the basic structure of viruses.
5. Differentiate between viruses and other microorganisms.
6. State the characteristics used to classify viruses.
7. List the taxonomic groups of viruses.
8. Describe the process of viral replication and reproduction.
9. Summarize the common plants virus diseases.
10. Discuss the economic importance of animal and plant viruses.
11. Describe the symptom infection by some human viruses
12. Discuss how viruses are transmitted and the application of control measures.

Summarize the different methods for isolation and purification of viruses

### 3. Course Learning Outcomes

CLOs		Aligned PLOs
1	<p><b>Knowledge:</b></p> <p>❖ Upon successful completion of this course The student will be able to:</p> <ol style="list-style-type: none"> <li>1. Define the virology term</li> <li>2. List the economic important for the viruses</li> <li>3. List the general properties of viruses</li> <li>4. Describe the reproduction method of the viruses</li> <li>5. Write the different types of viruses</li> <li>6. Describe the basic structure of viruses.</li> <li>7. Differentiate between viruses and other microorganisms.</li> <li>8. State the principle used to classify viruses.</li> <li>9. List the taxonomic groups of viruses.</li> <li>10. Describe the process of viral replication and reproduction.</li> <li>11. Summarize the symptom plant virus diseases.</li> <li>12. Describe the symptom infection by some human viruses</li> </ol>	
2	<p><b>Skills:</b></p> <p>2.1 <b>Cognitive skills to be developed</b></p> <p>❖ Having successfully completed the course students should be able to:</p> <ol style="list-style-type: none"> <li>1. Describe the basic structure of viruses.</li> <li>2. Interpret why viruses can't life outside the hosts</li> <li>3. Describe the process of viral replication.</li> <li>4. Discuss how viruses are transmitted to the host.</li> </ol>	

CLOs		Aligned PLOs
	5. Explain the different methods for isolation and purification of viruses. 6. Differentiate between viruses and other microorganisms 7. Summarize the general properties of viruses 8. Compare between the plant and animal viruses regarding the structure. 9. write the principle or the basis for classification viruses. 13. List the taxonomic groups of viruses according Baltimore. 14. Describe the process of viral replication and reproduction. 15. Summarize the common plants virus diseases. 16. Discuss the economic importance of animal and plant viruses. 17. Describe the symptom infection by some human viruses 18. Write the rapid methods used for detection of human viruses. 19. Predict from the symptoms type the virus.	
2.2.	<b>Psychomotor Skills</b> <ul style="list-style-type: none"> <li>❖ Upon successful completion of this course, the student is expected to be able to:               <ol style="list-style-type: none"> <li>1. Practice the basic Lab. Skills.</li> <li>2- Diagram the virus structure</li> <li>3-Draw virus replication</li> <li>4-Demonstrate the symptoms of different viruses</li> </ol> </li> </ul>	
<b>3</b>	<b>Competence:</b>	
3.1	<ul style="list-style-type: none"> <li>❖ Upon successful completion of this course, the student is expected to be able to:               <ul style="list-style-type: none"> <li>• Developing oral presentations.</li> <li>• Communicating personal ideas and thoughts.</li> <li>• Work independently and as part of a team to finish some assignments.</li> <li>• Communicate results of work to others.</li> <li>• Use of needed precautions when dealing with pathogen microorganisms</li> <li>• Demonstrate professional attitudes and behaviors towards others.</li> <li>• Propose the smart questions</li> <li>• Understand and dissecting the problem so that it is fully solved understood.</li> <li>• Demonstrate the assertiveness for his decision.</li> <li>• Demonstrate his capability for the responsibility and Accountability</li> <li>• Show Effective verbal communication with clarity and must be characterize with the following interpersonal attributes; (verbal communication, Non-verbal communication, good listening for the others, questioning, good manners, problem solving, Social awareness,self-management, responsibility and accountability)</li> <li>• Enhancing the ability of students to use computers and internet.</li> <li>• Interpret the laboratory data.</li> <li>• Know how to write a report.</li> </ul> </li> </ul>	

## C. Course Content

### 1 Topics to be Covered

Topic	No of Weeks	Contact hours
<b>❖ General Virology</b> - Brief outline on discovery of viruses - Nomenclature and classification of viruses - Distinctive properties of viruses - Morphology and ultra-structure - Capsids and their arrangements - Types and structures of viral envelopes. - Viral genome composition. - Virus related agents (viroids, prions, satellites).	2	4
<b>❖ Bacterial Viruses</b> -General Properties of bacterial viruses - Bacteriophage structural organization. - Life cycle. - Bacteriophage typing. - Application in bacterial genetics.	3	6
<b>❖ Plant Viruses</b> -General Properties of bacterial viruses - Classification and nomenclature. - Effects of viruses on plants; appearance of plants. - Histology, physiology and cytology of infected plants. - Common virus diseases of plants. - Life cycle and type species of plant viruses. - Prevention of crop loss due to virus infection	3	6
<b>❖ Animal Viruses</b> -General Properties of bacterial viruses - Classification and nomenclature of animal human viruses - Epidemiology, lifecycle, pathogenicity. - Examples of certain important viral disease - Viral vaccines, interferon and antiviral drugs.	3	6
<b>❖ General Methods of Diagnosis of the viruses</b> - Cultivation of viruses in embryonated eggs, - Experimental animals, and cell cultures - Serological methods - ELISA Assay of viruses - Infectivity assay (plaque method) - Infectivity assay of plant viruses. PCR technique for virus detection	3	6
	<b>14 weeks</b>	<b>26 hrs</b>

#### D. Teaching and Assessment

##### 1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	<b>Knowledge</b>		
1.1	<b>❖</b> Upon successful completion of this course The student will be able to: 1. Define the virology term 2. List the economic important for the viruses 3. List the general properties of viruses	-The methodology includes a combination of lectures by the lecturer, seminar presentation by the	- Periodical exam (1) (10%) - Periodical exam (2) (10%) - Report and activity (10%)

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
	<ol style="list-style-type: none"> <li>4. Describe the reproduction method of the viruses</li> <li>5. Write the different types of viruses</li> <li>6. Describe the basic structure of viruses.</li> <li>7. Differentiate between viruses and other microorganisms.</li> <li>8. State the principle used to classify viruses.</li> <li>9. List the taxonomic groups of viruses.</li> <li>10. Describe the process of viral replication and reproduction.</li> <li>11. Summarize the symptom plant virus diseases.</li> <li>12. Describe the symptom infection by some human viruses.</li> </ol>	<p>students and web-interactions. Students will be given opportunity to understand the role of important microorganisms in different applications and human service.</p> <p>-At the end of the programme, students will be divided into groups for seminar presentation on important areas of the course to assess their understanding and comprehension of the course.</p> <p>-All students will be involved in on-line learning process and each student is required to create an E-mail address to facilitate student web interactions.</p> <p>-Using images and movies</p> <p>Encouraging students to collect the new information about what the new in virology</p> <p>-Enable the reference books and scientific sites concerning virology in internet.</p>	<p>- Mid- term theoretical exam (20%)</p> <p>Final exam (50%)</p>
<b>2.0</b>	<b>Skills</b>		
2.1	<p><b>Cognitive skills</b></p> <ul style="list-style-type: none"> <li>❖ Having successfully completed the course students should be able to: <ul style="list-style-type: none"> <li>• Describe the basic structure of viruses.</li> <li>• Interpret why viruses can't life outside the hosts</li> <li>• Describe the process of viral replication.</li> <li>• Discuss how viruses are transmitted to the host.</li> <li>• Explain the different methods for isolation and purification of viruses.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Lectures.</li> <li>• Brain storming.</li> <li>• Discussion.</li> </ul>	<ul style="list-style-type: none"> <li>• Exam must contain questions that can measure these skills.</li> <li>• Quiz and exams.</li> <li>• Discussions after the lecture.</li> </ul>

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
	<ul style="list-style-type: none"> <li>Differentiate between viruses and other microorganisms</li> <li>Summarize the general properties of viruses</li> <li>Compare between the plant and animal viruses regarding the structure.</li> <li>write the principle or the basis for classification viruses.</li> <li>List the taxonomic groups of viruses according Baltimore.</li> <li>Describe the process of viral replication and reproduction.</li> <li>Summarize the common plants virus diseases.</li> <li>Discuss the economic importance of animal and plant viruses.</li> <li>Describe the symptom infection by some human viruses</li> <li>Write the rapid methods used for detection of human viruses.</li> <li>Predict from the symptoms type the virus.</li> </ul>		
2.2	<p><b>Psychomotor Skills</b></p> <ul style="list-style-type: none"> <li>Having successfully completed the course students should be able to:               <ol style="list-style-type: none"> <li>practice the basic Lab. Skills.</li> <li>diagram the virus structure</li> <li>draw virus replication</li> <li>demonstrate the symptoms of different viruses</li> </ol> </li> </ul>	Follow up the students during collection of some virus infected plants samples from the environment	<ul style="list-style-type: none"> <li>Giving additional marks for the students they collect different viral infected plants from the environment</li> <li>Practical exam.</li> </ul>
3.0	<b>Competence</b>		
3.1	<ul style="list-style-type: none"> <li>Having successfully completed the course students should be able to:               <ul style="list-style-type: none"> <li>Developing oral presentations.</li> <li>Communicating personal ideas and thoughts.</li> <li>Work independently and as part of a team to finish some assignments.</li> <li>Communicate results of work to others.</li> <li>Use of needed precautions when dealing with pathogen microorganisms</li> <li>Demonstrate professional attitudes and behaviors towards others.</li> <li>Propose the smart questions</li> <li>Understand and dissecting the problem so that it is fully solved</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Open class discussions with students for minutes during lectures</li> <li>certain topics of the course.</li> <li>Case Study</li> <li>Active learning</li> <li>Small group discussion</li> </ul>	<ul style="list-style-type: none"> <li>Oral exams.</li> <li>Evaluate the efforts of each student in preparing the report.</li> <li>Evaluate the scientific values of reports.</li> <li>Evaluate the work in team</li> <li>Evaluation of students presentations</li> <li>Homework (preparing a report on some topics related to the course</li> <li>depending on web sites).</li> <li>Seminars presentation</li> </ul>



Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
	<p>understood.</p> <ul style="list-style-type: none"> <li>• Demonstrate the assertiveness for his decision.</li> <li>• Demonstrate his capability for the responsibility and Accountability</li> <li>• Show Effective verbal communication with clarity and must be characterize with the following interpersonal attributes; (verbal communication, Non-verbal communication, good listening for the others, questioning, good manners, problem solving, Social awareness, self-management, responsibility and accountability)</li> <li>• Enhancing the ability of students to use computers and internet.</li> <li>• Interpret the laboratory data.</li> <li>• Know how to write a report.</li> </ul>		

## 2. Assessment Tasks for Students

5. Schedule of Assessment Tasks for Students During the Semester				
Assessment	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Exam duration	Proportion of Final Assessment
1	Periodical Exam (s)	4	15 min	10 %
2	Mid Term Exam (Theoretic)	8	60 min	30 %
3	Mid Term Exam (practical)	--	--	--
4	Reports and essay	11	--	20 %
5	Final Practical Exam	--	--	--
6	Final Exam	16	120 min	40 %
<b>Total Marks</b>				<b>100%</b>

\*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

## E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

Office hours: 10hrs.

## F. Learning Resources and Facilities

### 1. Learning Resources

<b>Required Textbooks</b>	<ul style="list-style-type: none"> <li>Principles of Virology: 2004. 2nd ed. S. J. Flint, et al. ASM Press.</li> <li>Plant virology 3rd edition. R.E.F., Matthews (2006).</li> </ul>
<b>Essential References Materials</b>	<ul style="list-style-type: none"> <li>John B. Carter, Venetia A. Saunders, (2007) Virology: principles and applications .John Wiley and Sons– 358 pages</li> </ul>
<b>Electronic Materials</b>	<a href="http://microbiology.columbia.edu/virology.html">http://microbiology.columbia.edu/virology.html</a>
<b>Other Learning Materials</b>	<ul style="list-style-type: none"> <li>PPT prepared by Prof. Gamal E. H. Osman.</li> </ul>

### 2. Facilities Required

Item	Resources
<b>Accommodation</b> (Classrooms, laboratories, demonstration rooms/labs, etc.)	<ul style="list-style-type: none"> <li>Class room is already provided with data show</li> <li>The area of class room is suitable concerning the number of enrolled students (68) and air conditioned</li> </ul>
<b>Technology Resources</b> (AV, data show, Smart Board, software, etc.)	<ul style="list-style-type: none"> <li>Digital lab containing 15 computers.</li> </ul>
<b>Other Resources</b> (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	<ul style="list-style-type: none"> <li>Incubators, autoclaves, measuring equipment, water bath, digital balances, pH meters, safety facilities.</li> <li>Availability of some reference microorganisms strains</li> <li>Different media</li> <li>All chemicals and reagents that needed</li> <li>Availability all slides of plant and animal organs</li> </ul>

## G. Course Quality Evaluation

<b>1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching</b> <ul style="list-style-type: none"> <li>Questionaries</li> <li>Open discussion in the class room at the end of the lectures.</li> </ul>
<b>2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department</b> <ul style="list-style-type: none"> <li>Revision of student answer paper by another staff member.</li> <li>Analysis the grades of students.</li> </ul>
<b>3. Processes for Improvement of Teaching</b> <ul style="list-style-type: none"> <li>Preparing the course as PPT.</li> <li>Using scientific movies.</li> <li>Coupling the theoretical part with laboratory part</li> <li>Periodical revision of course content.</li> </ul>
<b>4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent faculty member of a sample of student work, periodic exchange and remarking of a sample of assignments with a faculty member in another institution)</b> <ul style="list-style-type: none"> <li>After the agreement of Department and Faculty administrations</li> </ul>
<b>5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.</b>

- [Periodical revision by Quality Assurance Units in the Department and institution](#)

**Evaluation areas** (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

**Evaluators** (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

**Assessment Methods** (Direct, Indirect)

## H. Specification Approval Data

<b>Prepared by faculty staff:</b> <b>1. Prof. Gamal E. H. Osman.</b> <b>2. Dr. Khaled Elbanna.</b>	<b>Signature:</b>
<b>Date Report Completed: 1.04.2018</b>	
<b>Revised by:</b> <b>1. Dr. Khaled Elbanna.</b> <b>2. Dr. Hussein H. Abulreesh.</b> <b>3. Dr. Shady M. ElShehawy.</b>	<b>Signature:</b>
<b>Date: 1.04.2018</b>	
<b>Program Chair</b> <b>Dr. Hussein H. Abulreesh.</b>	<b>Signature:</b>
<b>Dean</b>	<b>Signature:</b>
<b>Date:</b>	