

# MBSB 604 Virus-Cell Interactions and Immunity Syllabus

2<sup>nd</sup> Semester Academic Year 2023

## Course coordinator

Instructor	Email
Chutima Thepparit, Ph.D.	Chutima.thp@mahidol.edu

## Instructors

Pilaipan Puthavathana, Ph.D., Prof.  
Alita Kongchanagul, Ph.D., Asst. Prof.  
Ampa Suksatu, Ph.D., Asst. Prof.  
Arpaporn Sutipatanasomboon, Ph.D.  
Chutima Thepparit, Ph.D.  
Duangnapa Kovanich, Ph.D.  
Promsin Masrinoul, Ph.D.

## General Information

**Credit:** 3(3-0-6)  
**Curriculum:** Doctor of Philosophy Program in Systems Biosciences (Elective course)  
**Semester offering:** Second semester  
**Prerequisite:** None  
**Course level:** Intermediate

## Course description

Introduction to virology, Virus replication: attachment and entry, Virus replication and expression: RNA viruses, DNA viruses, reverse transcription and integration, Virus-host interactome, Intracellular trafficking, virus assembly, maturation and release, Viral pathogenesis, Cellular responses to viral infection (innate immunity and adaptive immunity), Antiviral agents, Virotherapy, Introduction to vaccinology, Vaccine design, and development

## Course Learning Outcomes (CLOs)

Upon completion of this course, students are able to:

1. Demonstrate core principles and comprehensive knowledge of fundamentals in virology, virus-host interactome, viral pathogenesis, cellular responses to viral infection.
2. Identify implications of virus-host interactome, antiviral agents, virotherapy, and vaccine design and development.
3. Critically evaluate and present recent published literature in the related field.

4. Formulate research questions or creative problems with integration of fundamental principles and knowledge in a manner appropriate to the virus-cell interactions and immunity discipline.

### Program Learning Outcomes (PLOs)

Upon completion of the Systems Biosciences program, students are able to:

1. Comply with ethical codes of conduct both personally and professionally.
2. Demonstrate core principles and comprehensive knowledge in systems biosciences.
3. Integrate innovative concepts and ideas from various disciplines.
4. Critically evaluate and solve sophisticated problems in systems biosciences.
5. Independently synthesize new knowledge with originality.
6. Demonstrate responsibility, interpersonal and team skills, and leadership, both individually and in groups.
7. Analyze statistical data and scientific information from relevant databases and information technology applications.
8. Effectively communicate relevant knowledge and research findings both orally and in writing to different audiences.

### Constructive Alignment of Course Content to CLOs and Program ELOs

Lecture no.	Topic	CLOs	PLOs
1	Viruses: A comprehension of their impact and implications	1	1, 2, 6
2	Virus entry and virus replication and expression: DNA viruses	1	1, 2, 6
3	Virus replication and expression: RNA viruses	1	1, 2, 6
4	Virus replication and expression: reverse transcription and integration	1	1, 2, 6
5	Viral pathogenesis	1	1, 2, 6
6	Intracellular trafficking, virus assembly, maturation, and release	1	1, 2, 6
7	Plant virus	1	1,2,6
8	Antiviral agents	2, 3	1, 2, 4, 6
9	Virus-host interactome	2,3	1, 2, 4, 6, 7
10	Virotherapy	2, 3, 4	1, 2, 6, 7
11	Cellular responses to viral infection I	1,3	1, 2, 4, 6
12	Cellular responses to viral infection II	1,3	1, 2, 4, 6
13	Introduction to vaccinology	3, 4	1, 2, 4, 6
14	Vaccine design and development	3, 4	1-4, 6, 7
15	Assignment presentation and discussion	1, 2, 3, 4	1-4, 6-8

## Course Schedule 2023

No.	Day	Date	Topic	Lecturer
1	Tue*	6 Feb 24	Viruses: A comprehension of their impact and implications	Pilaipan
2	Fri	9 Feb 24	Virus entry and virus replication and expression: DNA viruses	Promsin
3	Tue*	13 Feb 24	Virus replication and expression: RNA viruses	Ampa
	Wed	14 Feb 24	Self-study	
4	Fri	16 Feb 24	Intracellular trafficking, virus assembly, maturation, and release	Chutima
5	Mon	19 Feb 24	Virus replication and expression: reverse transcription and integration	Ampa
6	Tue*	20 Feb 24	Viral pathogenesis	Ampa
7	Fri	23 Feb 24	Plant virus	Arpaporn
	Mon	26 Feb 24	Holiday	
8	Tue*	27 Feb 24	Virus-host interactome	Duangnapa
9	Wed	28 Feb 24	Antiviral agents	Chutima
10	Fri	1 Mar 24	Virotherapy	Promsin
11	Mon	4 Mar 24	Cellular responses to viral infection I	Alita
12	Wed	6 Mar 24	Cellular responses to viral infection II	Alita
	Fri	8 Mar 24	Self-study	
13	Mon	11 Mar 24	Viral vaccine I	Promsin
14	Wed	13 Mar 24	Viral vaccine II	Promsin
	Fri	15 Mar 24	Self-study	
15	Mon	18 Mar 24	Assignment presentation and discussion	All

Monday, Tuesday\*, Wednesday, and Friday, Time 13:00-16:00, Online lecture

### Assignments

1. Reading or problem-solving assignments from instructors
2. Paper discussions
3. Presentation

### Assessment Criteria

Assessment Criteria	Assessment Method	Assessment Criteria
Assignment (70%)	1) In-class/Take-home assignments	1) Punctual assignment submission 2) Creativity 3) Sequencing of information 4) Content accuracy 5) Supporting evidence

Assessment Criteria	Assessment Method	Assessment Criteria
<b>Attendance/participation (10%)</b>	1) Direct observation	6) Grammar and originality
	2) Group activities and discussion	1) Attendance and punctuality
<b>Presentation (20%)</b>	1) Presentations	2) Participation
	2) Group discussion	3) Distracting behaviors
		4) General attitude towards learning
		1) Organization
		2) Content
		3) Subject knowledge/ answering questions
		4) Presentation style

Students must receive a score of 60% or more to pass the course. Student's achievement will be graded using symbols: A, B+, B, C+, C and F based on the following criteria;

Percentage	Grade	Description
≥ 80%	A	Excellent
75-79.99%	B+	Good
70-74.99%	B	Fairly good
65-69.99%	C+	Fair
60-64.99%	C	Poor
< 60%	F	Fail

However, a final grade will be adjusted based on frequency distribution of student's scores from the whole course.

### Appeal Procedure

Should the students have any appeal regarding the assessments or grade, inquiry can be made to the instructors and/or the course coordinator immediately either by direct contact, telephone or email.

### Course Reading Materials

#### 1. Textbooks and Core Instructional Materials

1. Flint S.J. Principles of Virology. Fourth Edition. ASM press. (2015)

#### 2. Essential Documents and Information

1. <http://www.ncbi.nlm.nih.gov/pubmed>
2. <http://www.cdc.gov/vaccines/pubs/pinkbook/index.html>

#### 3. Recommended Documents and Information

1. <http://www.virology.ws/> These materials may be found on the google classroom.

## General Inquiry

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