

Microbiology and Immunology 3200B: Virology

Draft - Course description

Virology elucidates the complexities of viruses, informing strategies for disease prevention, vaccine development, and therapeutic interventions, playing a pivotal role in advancing public health and medical research. Lectures will focus on the understanding of viral genomes, structures, and replication and students will participate in a collaborative inquiry-based term project.

Antirequisite(s): the former Microbiology and Immunology 3100A

Prerequisite(s): Biochemistry 2280A, Biology 2581A/B and Microbiology and Immunology 2500A/B.

Pre- or Corequisite(s): it is recommended, but not required, that Biochemistry 3381A be taken previously

Extra Information: 3 lecture hours

Course Weight: 0.5 course

Draft - Course Summary:

Upon successful completion of this course, students will be able to:

- examine key aspects of viruses and emerging viruses, infectious cycles, viral structure, and replication
- explore how cutting-edge methodologies are being used to study viruses
- evaluate different types of intrinsic and innate immune defenses against viral infections
- describe the science of pandemics and their impact on various health sectors
- explore the interdisciplinary approaches used to address infectious diseases
- evaluate the effectiveness of vaccines and antivirals in viral prevention and treatment
- develop critical thinking and problem-solving skills through collaborative brainstorming and decision-making
- apply knowledge of biology, medicine, and social sciences to real-world challenges, and
- collaborate with peers on a term project to develop communication and teamwork skills.

Draft - Anticipated Grading Structure:

- Midterm test – multiple choice and short answer (25%)
- Final Exam – multiple choice and short answer (35%)
- Term Project (flipped classroom) – written report, oral presentation, participation (40%). Breakdown:
 - Report (critical thinking, problem-solving, creativity and innovation skills from the think tank exercises): students will collaboratively write a 10-15-page report for their inquiry-based Term Project (20%)
 - Participation, professionalism, and engagement in the project phases and teamwork abilities: students will provide insights regarding the contributions of each team member in their group. The Course Instructor will review students' perspectives and, in consultation with TAs, assign a grade reflective of each student's professional engagement in the Term Project (10%)
 - Presentation: each student will present their term project individually to members of different groups (10%)

Draft Course Schedule

Week #	Day #	Topic	Instructor
1	1	Intro to course and lecture on “The Science of Pandemics”	Dr. Stephen Barr
2	2	The Science of Pandemics – continued	Dr. Stephen Barr
	3	Emerging Viruses	Dr. Stephen Barr
2	4	The Infectious Cycle	Dr. Stephen Barr
	5	Flipped Classroom – Think Tank Session	Dr. Stephen Barr + TAs
	6	Virology Methodologies	Dr. Stephen Barr
3	7	Genomes and Genetics	Dr. Stephen Barr
	8	Structure of Viruses	Dr. Stephen Barr
	9	Flipped Classroom – Think Tank Session	Dr. Stephen Barr + TAs
4	10	Attachment and Entry	Dr. Stephen Barr
	11	Synthesis of RNA from RNA	Dr. Stephen Barr
	12	Transcription and RNA Processing	Dr. Stephen Barr
5	13	Flipped Classroom – Think Tank Session	TAs
	14	Viral DNA Replication	Dr. Stephen Barr
	15	Reverse Transcription and Integration	Dr. Stephen Barr
6	16	Assembly of Viruses	Dr. Stephen Barr
	17	Flipped Classroom – Think Tank Session	TAs
	18	The Infected Cell	Dr. Stephen Barr
7	19	Infection Basics	Dr. Stephen Barr
	20	Intrinsic and Innate Defenses	Dr. Stephen Barr
	21	Flipped Classroom – Think Tank Session	Dr. Stephen Barr + TAs
8	22	Unusual Infectious Agents	Dr. Stephen Barr
	23	HIV/AIDS	Dr. Stephen Barr
	24	Anatomy of the COVID-19 Pandemic	Dr. Stephen Barr
9	25	Flipped Classroom – Think Tank Session	Dr. Stephen Barr + TAs
	26	Flipped Classroom – Think Tank Session	TAs
	27	Flipped Classroom – Think Tank Session	TAs
10	28	Flipped Classroom – Think Tank Session	TAs
	29	Flipped Classroom – Think Tank Session	TAs
	30	Flipped Classroom – Think Tank Session	TAs
11	31	Flipped Classroom – Think Tank Session	TAs
	32	Think Tank Project Presentations	Dr. Stephen Barr + TAs
	33	Think Tank Project Presentations	Dr. Stephen Barr + TAs
12	34	Think Tank Project Presentations	Dr. Stephen Barr + TAs
	35	Think Tank Project Presentations	Dr. Stephen Barr + TAs
	36	Think Tank Project Presentations	Dr. Stephen Barr + TAs
13	37	Think Tank Project Presentations	Dr. Stephen Barr + TAs
	38	Think Tank Project Presentations	Dr. Stephen Barr + TAs