Course Syllabus – IMS 520

Course Information

Course Number: IMS 520 SP25
Course Name: Virology
Term: SP 2025
Start Date: 04/08/2025
End Date: 06/27/2025
Credits: 3.0

Meeting Days / Times

Tuesdays and Thursdays, 9:45-11:15am PT / 12:45-2:15pm ET
(See Calendar in Canvas for the most up-to-date schedule.)

Location
CA: Graduate Office Dining Room (Hazen Theory Building)
FL: B387

Course Managers

Role	Last Name	First Name	Email Address
Course Director	de la Torre	Juan Carlos	juanct@scripps.edu
Course Director	Law	Mansun	mlaw@scripps.edu
Course Director	Martins	Mauricio	mmartins@scripps.edu
TA	Cusic	Renee	rcusic@scripps.edu
TA	Zhou	Ruifeng	ruifzhou@scripps.edu

Course Description

This is a twelve-week course intended for students who wish to improve their knowledge of the fundamental principles of virology. It will focus on human viruses associated with clinically relevant diseases. Subject matter will include basic aspects of virus structure, evolution, and cell entry mechanisms, as well as the role of host immune responses, development of vaccines and antiviral drugs, and the use of viral vectors for biomedical applications.

Program Learning Outcomes

By the end of the program, students will have accomplished these objectives:
PLO1: Original Research – graduate students are expected to develop the skills critical for generating high-quality research output. This would include absorbing, recalling, and contextualizing scientific knowledge, evaluating scientific information and data, creating testable hypotheses and investigating hypotheses, mastering scientific tools and techniques, displaying ethical behavior, and receiving and giving feedback.

PLO2: Communication – graduate students are expected to demonstrate the oral, written, and media skills to effectively communicate the impact of a study or a body of work to the greater scientific community and to the public at large using a number of methods.
PLO3: Critical Thinking – graduate students are expected to develop a self-directed process to analyze information, form opinions or judgments, and use this process to improve the quality of their scientific thoughts, navigate problems, and make informed decisions.
PLO4: Intellectual Curiosity – graduate students are expected to acquire the capacity to build their intellectual curiosity and demonstrate problem solving approaches that serve their professional growth and ability to impact a field.
PLO5: Career and Professional Development – graduate students are expected to develop a variety of transferable skillsets throughout their graduate experience, including management and leadership, inclusiveness, resilience, scientific rigor, collaboration, accountability, time management, teamwork, networking, and career planning.

Course Learning Outcomes

Upon completion of this course students will be able to:
CLO1: Understand the link between viruses and the impact on public health.
CLO2: Acquire knowledge on the spread and evolution of emerging viral pathogens.
CLO3: Become familiar with basic aspects of virus structure.
CLO4: Describe virus-host cell interactions for both enveloped and non-enveloped viruses.
CLO5: Know essential aspects of immune responses against viruses in infection and vaccination.
CLO6: Be introduced to modern antiviral drug and viral vector development.
CLO7: Be able to describe clinically relevant viral families.

Background Preparation (Prerequisites)

Previous course work in microbiology, cell biology and biochemistry would be helpful.

Course Materials

Useful to consult:

Flint, Racaniello, Rall, Hatziioannou & Skalka (2020). Principles of Virology - Volume I: Molecular Biology; Volume II: Pathogenesis and Control (5th Edition). ISBN: 978-1683673606 / 978-1683673590. 4th edition can be accessed HERE.

Oldstone (2020). Viruses, Plagues, and History: Past, Present, and Future. ISBN: 978-0190056780.

Course Requirements

Students are expected to participate actively in the class.

Exam will be in the form of critical review of virology literature, presentations and discussion. Students will research independently and collaboratively on diverse topics on paradigm-shifting virology concepts and major human viral diseases.

Attendance Statement

Students are expected to attend all classes. Students who are unable to attend class must seek permission for an excused absence from the course director or teaching assistant. Unapproved absences or late attendance for three or more classes may result in a lower grade or an "incomplete" for the course. If a student has to miss a class, he or she should arrange to get notes from a fellow student and is strongly encouraged to meet with the teaching assistant to obtain the missed material.

Scientific and Professional Ethics

The work you do in this course must be your own, unless expressly instructed as part of the collaborative effort of the research project. Feel free to build on, react to, criticize, and analyze the ideas of others but, when you do, make it known whose ideas you are working with. You must explicitly acknowledge when your work builds on someone else's ideas, including ideas of classmates, professors, and authors you read. If you ever have questions about drawing the line between others' work and your own, ask the course professor who will give you clear guidance. The use of artificial intelligence chatbots (e.g., ChatGPT) in the preparation or writing of scientific reports is prohibited.

Technology Requirements and Support

For issues related to Canvas, please contact the Graduate Office by email at: gradprgm@scripps.edu or by phone at: 858-784-8469.

Course Grading

Grading is in accordance with the academic policies of the Skaggs Graduate School. The breakdown of grading is as follows:

- Class contribution (20%) + Presentation of a virology topic (50%) + Participation in discussion (30%) = 100%

Letter Grade	Percent	GPA	Description
A	93-100	4.00	Outstanding achievement. Student performance demonstrates full command of the course subject matter and evinces a high level of originality and/or creativity that far surpasses course expectations.
A-	90-92	3.67	Excellent achievement. Student performance demonstrates thorough knowledge of the course subject matter and exceeds course expectations by completing all requirements in a superior manner.
B+	87-89	3.33	Very good work. Student performance demonstrates above-average comprehension of the course subject matter and exceeds course expectations on all tasks as defined in the course syllabus. There is notable insight and originality.
B	83-86	3.00	Satisfactory work. Student performance meets designated course expectations and demonstrates understanding of the course subject matter at an acceptable level.
B-	80-82	2.67	Marginal work. Student performance demonstrates incomplete understanding of course subject matter. There is limited perception and originality.

C+	77-79	2.33	Unsatisfactory work. Student performance demonstrates incomplete and inadequate understanding of course subject matter. There is severely limited or no perception or originality. Course will not count toward degree.
C	73-76	2.00	Unsatisfactory work. Student performance demonstrates incomplete and inadequate understanding of course subject matter. There is severely limited or no perception or originality. Course will not count toward degree.
P	73-100	0.00	Satisfactory work. Student performance demonstrated complete and adequate understanding of course subject matter. Course will count toward degree.
F	0-73	0.00	Unacceptable work/Failure. Student performance is unacceptably low level of knowledge and understanding of course subject matter. Course will not count toward degree. Student may continue in program only with permission of the Dean.
I		0.00	Incomplete is assigned when work is of passing quality but is incomplete for a pre-approved reason. Once an incomplete grade is assigned, it remains on student's permanent record until a grade is awarded.
W		0.00	Withdrew from the course with Dean's permission beyond the second week of the term.

- All courses will be recorded and maintained in the student's permanent academic record; only courses that apply towards the degree will appear on the academic transcript. Non-credit or audited courses will not appear on the transcript.
- 4 core courses taken for a letter grade (pass = B- or higher for a core course)
- 2 elective courses taken pass/fail (pass = A, B, C for an elective)

Course Summary

Date	Details
Tue Apr 8, 2025	Introduction to Virology I (General concepts / Viral pathogenesis: de la Torre)
Thu Apr 10, 2025	Introduction to Virology II (Viral entry and replication: Law)
Tue Apr 15, 2025	Application of Microscopy in Virology (Park)
Thu Apr 17, 2025	Interaction of viruses and small RNA (MacRae)
Tue Apr 22, 2025	Virus structure (Johnson)
Thu Apr 24, 2025	Antiviral drugs (Chatterjee)
Tue Apr 29, 2025	Arenaviruses (de la Torre)
Thu May 1, 2025	Viral Hepatitis (Law)
Tue May 6, 2025	Flaviviruses (Burke)
Thu May 8, 2025	HIV biology I (Martins)
Tue May 13, 2025	HIV biology II (Martins)
Thu May 15, 2025	Influenza virus (Wilson)
Fri May 16, 2025	Commencement (No Class)
Tue May 20, 2025	Systems Biology in Virology (Chanda)
Thu May 22, 2025	Virus Neutralizing Antibody (Burton)
Mon May 26, 2025	No Class (Memorial Day)
Tue May 27, 2025	Ebolaviruses (Murin)
Thu May 29, 2025	Viral Vectors (Martins)
Tue Jun 3, 2025	Critical Review: Training Session
Thu Jun 5, 2025	Critical Review
Tue Jun 10, 2025	Critical Review

Thu Jun 12, 2025	Critical Review
Tue Jun 17, 2025	Critical Review
Thu Jun 19, 2025	No Class (Juneteenth)
Tue Jun 24, 2025	Critical Review
Thu Jun 26, 2025	Critical Review