

Course Syllabus – IMS 520

Course Information

Course Number: IMS 520 SP21

Course Name: Virology

Term: SP 2021

Start Date: 04/06/2021

End Date: 06/25/2021

Credits: 3.0

Meeting Days / Times

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

Location

Online via Zoom

Course Managers

Role	Last Name	First Name	Email Address
Instructor	Law	Mansun	mLaw@scripps.edu
Instructor	Nemerow	Glen	gnemerow@scripps.edu
TA	Fang	Jingru	jfang@scripps.edu
TA	Mori	Luisa	lmori@scripps.edu

Course Description

This is a ten-week course intended for students who wish to improve their knowledge of the fundamental principles of virology. It will focus on human RNA and DNA viruses associated with emerging diseases. Subject matter will include basic aspects of virus structure, evolution, and cell entry mechanisms as well as the role of host immune responses, implications for anti-viral and vaccine development, and the use of viral vectors for gene transfer.

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 civilizations.

CLO2: Acquire knowledge on the spread and evolution of emerging viral pathogens.

CLO3: Identify the types of viruses involved in emerging diseases.

CLO4: Have a good understanding of basic aspects of virus structure.

CLO5: Describe virus host cell interactions for both enveloped and non-enveloped viruses.

CLO6: Describe several virus families important in human diseases and viral pathogenesis studies.

CLO7: Have a good knowledge of adaptive immune responses in vaccine research.

CLO8: Have a good knowledge of modern antiviral drug and viral vector development.

Background Preparation (Prerequisites)

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

Course Materials

Useful to consult:

Flint, Racaniello, Rall, Hatzioannou & 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. 2nd edition.

Course Requirements

Students are expected to participate actively in the class.

Midterm and final exams will be in the form of written reports and short presentations. Students will research independently and collaboratively on diverse topics of a major human viral disease (2020/2021 class: COVID).

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. Missed extra-credit quizzes will not be available for re-taking.

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.

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:

- Midterm class contribution, research report and presentation: 50%
- Final class contribution, research report and presentation: 50%

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	0-72	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 Schedule:

Date	Details
Tue Apr 6, 2021	Introduction to Virology (Law)
Thu Apr 8, 2021	Spread and evolution of severe viruses during human outbreaks (Andersen)
Tue Apr 13, 2021	Virus structure I (Johnson)
Thu Apr 15, 2021	Virus structure II (Johnson)
Tue Apr 20, 2021	Virus entry: non-enveloped virus (Nemerow)
Thu Apr 22, 2021	Virus egress and entry: enveloped virus (Law)
Tue Apr 27, 2021	Antiviral drugs (Chatterjee)
Thu Apr 29, 2021	Influenza virus (Wilson)
Tue May 4, 2021	Emerging paramyxoviruses (Norris/Saphire)
Wed May 5, 2021	Mid Term Exam Report
Thu May 6, 2021	Mid Term Exam Presentation
Tue May 11, 2021	Interaction of viruses and small RNA (MacRae)
Thu May 13, 2021	Viral vectors (Nemerow)
Tue May 18, 2021	Innate immunity against viruses (Paust)
Thu May 20, 2021	Cellular immunity / Vaccine (Martins)
Tue May 25, 2021	Humoral immunity / Vaccine (Burton)
Thu May 27, 2021	Arenaviruses and Lassa fever (de la Torre)
Tue Jun 1, 2021	Persistent viral infection and immune exhaustion (Teijaro)
Thu Jun 3, 2021	Retroviruses and HIV (Valente)
Tue Jun 8, 2021	Viral hepatitis (Law)
Wed Jun 9, 2021	Final Exam Report
Thu Jun 10, 2021	Final Exam presentation