

MCB4503/MCB5505: Virology

Course Description

This course is for graduate students and is designed to introduce you to the field of virology, and teach you the components of viruses, their replication strategies, and the human diseases caused by common and emerging pathogen. This course will also cover the importance of viruses in the maintenance of human health (e.g. the virome, gut homeostasis, and involvement in the development of non-viral disorders) and how viruses can be manipulated by scientists for the treatment of disease.

Course Goals

Upon completion of this course, you should have a solid knowledge of the basic characteristics of viruses and know the mechanisms of infection and replication for each type of viral genome. You should also be able to name pathogens belonging to each viral genome category and be able to describe the disease, infection, and transmission characteristics of these pathogens.

Instructor

Dr. Melissa Jones
Assistant Professor
Department of Microbiology and Cell Science

Contact Information

Phone: 352-392-5923
Email: Through Canvas

Office Hours

Dr. Jones will have office hours weekly on Tuesday from 12-1pm via **Zoom**. If you need to speak to Dr. Jones privately, send an email to schedule an appointment. When emailing to request an appointment, provide **three** potential days/times for the meeting, and Dr. Jones will select one and confirm the selected time. You **must reply to the confirmation email** to finalize the appointment. One-on-one meetings can be held in person or via phone or Zoom.

Communication

Questions regarding course material should be submitted to TAs or the FAQ board of the Canvas page. If those means of communication do not answer the question, then email Dr. Jones your question. Please email Dr. Jones directly for any matters specific to the student (e.g., illness). Dr. Jones typically responds to emails within 48 hours.

Prerequisites

Microbiology, Genetics, Biochemistry, or Molecular Biology course

Teaching Assistants

Names and email addresses can be found on the course Canvas page and in the announcement that designates TA assignments (which will be posted a few days after add/drop). Given the large size of this class, students will be assigned to a specific TA after the drop/add period. Please reach out to your TAs if you have questions about course content or material. TAs cannot provide extensions to exam or assignment due dates. All of those requests should be sent to Dr. Jones.

Required Textbook

Flint, S. J., Racaniello, V. R., Rall, G. F., Hatziioannou, T., & Skalka, A. M. (2020). *Principles of virology: Volume 1 (5th Edition)*

Students are allowed to use previous editions of the required text. However, it is the student's responsibility to find the corresponding text sections in older editions. Chapter and page designations will only be provided for the edition noted above.

If you are interested in a thorough accessory textbook for referencing virology topics, Fields Virology is a wonderful resource. Field's Virology is **NOT** required. Print versions are quite expensive, but this text is available through the UF library online system. More details about the system are listed below and can be found on the course website.

Course Structure

As an online course, there will be a collection of modules that contain lectures, videos, podcasts, and written materials to be viewed by the student to facilitate learning of basic principles of virology. Students will be assessed through weekly quizzes, assignments, discussion board posts, and examinations.

Grading

Below is the breakdown of how the different course components are weighted. Beneath the tables are explanations about each component.

MCB 4503	
Quizzes (x14, 4 pts each)	56
Exams (x3, 90 pts each)	270
Class Assignment #1	30
Class Assignment #2	60
Class Assignment #3	30
Discussion Posts (x1, 15 pts each)	15
Study Guides (x3, 40 pts each)	120
Total Points Available	581

MCB 5505/MCB 4503 – Honors Students	
Quizzes (x14, 4 pts each)	56
Exams (x3, 90 pts each)	270
Class Assignment #1	30
Class Assignment #2	60
Class Assignment #3	30
Discussion Posts (x1, 15 pts each)	15
Study Guides (x3, 40 pts each)	120
Honors Assignments (x3, 25 pts each)	75
Total Points Available	656

Grading Scale

The cutoffs for letter grades will be as follows:

Grading Scale			
	Percentage		Percentage
A	93.0 - 100%	C	72.0 - 75.99%
A-	89.0 - 92.99%	C-	69.0 - 71.99%
B+	86.0 - 88.99%	D+	66.0 - 68.99%
B	82.0 - 85.99%	D	62.0 - 65.99%
B-	79.0 - 81.99%	D-	59.0 - 61.99%
C+	76.0 - 78.99%	E	58.99% and below

**Grade rounding will be done as outlined above.

**UFs current grading policies can be found at <https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/>

Quizzes

There will be a short quiz assigned each week, 10 days given to complete them. Any quizzes submitted after the posted due date will have points deducted from the final score for being late. Quizzes are due

by 11:59 pm EST of the assigned due date and the quizzes must be completed by that time. Please allow adequate time to take the quiz before 11:59 pm EST. Be aware that if a quiz is started before 11:59 pm EST but not completed until after that time, it WILL be marked late. Quizzes are open book and open note and should be viewed as an opportunity to review the material and focus your study for the larger examinations. Quiz questions will not be used on the exams, but the same material will be covered.

Syllabus/Intro Quiz

Important information about the course is found in the syllabus and it is required that each student read the syllabus to find answers to commonly asked questions and information about various aspects of the class. This quiz also covers the plagiarism lecture found under the “Start Here” link. Information from this video is also on the introductory quiz. This **mandatory syllabus/intro quiz** must be taken and passed with an 80% before access to the first module will be granted.

Examinations

There will be three mandatory exams in this course. There will also be a cumulative, but optional, final given during exam week. The score from the optional final may be used to replace a lower exam grade from one of the previous exams. If all four exams are taken by the student, the highest three scores will be used to calculate the final grade. Therefore, if you do poorly on an exam during the semester, you can improve your grade by doing better on the final exam. Exams will be open for a 72-hour window and must be taken within that time period. Make-up of missed exams will follow UF policy. Further information regarding make-up exams, assignments, and other work can be found at: <https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>.

Exam Policy

All exams are proctored online using HonorLock.

Assignments

There are three general class assignments given during the semester. The purpose of these assignments is to deepen your understanding of either the field of virology or specific viruses. Class Assignments #1 and #3 will be the same for all students. For Class Assignment #2, each student will choose one pathogenic **virus** that they will then use to complete the assignment. This virus may be a pathogen of humans, plants, or animals. It is suggested that students pick well-characterized or heavily studied viruses as this will make the task of finding information about the virus significantly easier. Upon completion of any class assignment, students will upload documents to Canvas. These are NOT group assignments and students are expected to complete them individually. The Turn-It-In feature on Canvas automatically compares all assignment submissions and checks for plagiarism of both published material and submitted assignments. **Plagiarism of outside material or other students will not be tolerated.** To avoid accidental plagiarism, refer to the video posted in the introductory module which can be accessed through the “Start Here” link on the course Canvas Page.

Graduate Student and Honors Student Writing Assignments

For students enrolled in the graduate level course (MCB 5505) or in the Honors section of the undergraduate course, throughout the semester these students will be assigned scientific papers to read and analyze. Students will be provided with guidelines for how analysis of the papers should be completed. During the semester, students will submit, 1-2 page reports on the topics covered and reports will be submitted through Canvas.

Discussion Board Posts

All students are expected to participate in their group's discussion board assignments. Posts are graded on a pass/fail basis and should be a minimum of 5 sentences. A 5-10 sentence response is typical. Each student must post in the discussion before they will be allowed to see responses from other students. "Ghost posts" (i.e., posting one word or a period so other student responses can be viewed) will receive an automatic failing grade. Specifics about the parameters for responses will be provided with each assignment prior to the opening of the post.

Study Guides

Prior to each exam a study guide assignment will be posted. Each study guide will be broken into sections by module and each section will contain 8-10 statements/questions. Each student within the group will be assigned one section. The groups will combine their sections and submit ONE document before the due date. This will be a peer-graded assignment where the members of a group will grade all the other members on their participation in the assignment and the content submitted. After all the assignments are submitted Dr. Jones will post the study guides from the best 3-4 groups. These will serve as your study guides for the exam.

Student Groups

Given the large size of this course (400+ students), the class will be divided into groups of approximately 5 students, and these student groups will be assigned to a specific TA. Groups are randomly assigned and you cannot request group members. The purpose of these groups is to aid in the timely answering of questions regarding assignments and course content. For questions regarding the course material, please contact your TA for clarification or explanation. If your question cannot be answered, then the TA will forward it to the instructor. TAs can also clarify due dates or assignment descriptions. TAs can NOT grant deadline extensions or alter grades. These requests must be placed with Dr. Jones.

In addition, student groups will also be used for Discussion Post and Study Guide assignments. The Discussion posts are NOT group assignments, but rather a way of better facilitating discussion through the use of smaller groups. The study guides are group assignments. These groups will remain the same throughout the semester.

Readings

Each week "required" and "suggested" portions of the textbook will be assigned. Required readings will be portions of the textbook that are important for you to know but may not be thoroughly covered in lectures. Exam questions will be taken from these sections. Suggested readings will reiterate what is covered in lectures and are provided to help further your understanding of the material covered.

Extra Credit Assignments

Prior to each exam, students will be allowed to submit exam questions for extra credit. Dr. Jones will compile these questions and make them available to the entire class as a practice test.

Due Dates

All assignments are due by 11:59 pm EST on the specified due date. Any assignment submitted after 11:59 pm EST on the due date will be marked as late, even if the assignment was started (e.g., a quiz) prior to the final submission time. Canvas documents submission times based on the time zone in which the University resides and time stamps submissions accordingly. Therefore, students who reside outside

EST will need to ensure their assignments are submitted by 11:59 pm EST and **NOT** their local time. **For each day an assignment is late, 10% will be deducted from the score.**

Library access

The university library has access to the majority of medical and scientific journals as well as a variety of virology and microbiology textbooks in electronic format. UF students can access these resources through the UF libraries website (<http://library.health.ufl.edu>). However, students must be on the UF network (on-campus or remotely through the UF VPN). Instructions for accessing the UF VPN are provided on the course Canvas page.

Attendance and Make-up Policy

Given the asynchronous, online nature of this course, formal attendance will not be taken. However, it is expected that students watch each posted lecture and complete all readings, assignments, quizzes and exams. Exam and assignment make-ups and extensions will only be provided for reasons that constitute an excused absence include: Family emergencies (e.g. death or serious injury in the immediate family), special curricular requirements, military obligations, severe weather conditions, religious holidays, and participation in official university activities. For all absences, documentation **MUST** be provided (doctor's note, notification of military service, etc.). Further information regarding make-up exams, assignments, and other work can be found at: <https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>

Students With Disabilities

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the Disability Resource Center (<https://disability.ufl.edu/get-started/>). It is important for students to share their accommodation letter with their instructor and discuss their access needs as early as possible in the semester.

Online Course Evaluation Process

Student assessment of instruction is an important part of efforts to improve teaching and learning. At the end of the semester, students are expected to provide professional and respectful feedback on the quality of instruction in this course using a standard set of university and college criteria. These evaluations are conducted online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Evaluations are typically open for students to complete during the last two or three weeks of the semester; students will be notified of the specific times when they are open. Evaluations can be completed through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summary results of these assessments are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

Academic Honesty

As a student at the University of Florida, you have committed yourself and are bound to uphold the Honor Code, which includes the following pledge: "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity by abiding by the Honor Code." You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit at the University of Florida, the

following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment."

It is assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks (e.g., assignments, papers, quizzes, exams). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct to the appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see:

<http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code>.

In-Class Recordings

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are: (1) for personal educational use, (2) in connection with a complaint to the university, or (3) evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited.

A "class lecture" is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of that presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include student presentations, academic exercises involving solely student participation, assessments (quizzes, tests, exams), private conversations between students in the class, or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To "publish" means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third-party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

Software Use

All faculty, staff, and students of the university are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against university policies and rules, disciplinary action will be taken as appropriate.

Campus Helping Resources

Students experiencing crises or personal problems that interfere with their general well-being are encouraged to utilize the university's counseling resources. Both the Counseling Center and Student Mental Health Services provide confidential counseling services at no cost for currently enrolled

students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance.

- U Matter, We Care: If you or someone you know is in distress, please contact umatter@ufl.edu, 352-392-1575, or visit U Matter, We Care website to refer or report a concern and a team member will reach out to the student in distress.
- Counseling and Wellness Center: Visit the Counseling and Wellness Center website or call 352-392-1575 for information on crisis services as well as non-crisis services.
- Student Health Care Center: Call 352-392-1161 for 24/7 information to help you find the care you need, or visit the Student Health Care Center website.
- University Police Department: Visit UF Police Department website or call 352-392-1111 (or 9-1-1 for emergencies).
- UF Health Shands Emergency Room / Trauma Center: For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road, Gainesville, FL 32608; Visit the UF Health Emergency Room and Trauma Center website.
- GatorWell Health Promotion Services: For prevention services focused on optimal wellbeing, including Wellness Coaching for Academic Success, visit the GatorWell website or call 352-273-4450.

Academic Resources

- E-learning technical support: Contact the UF Computing Help Desk at 352-392-4357 or via e-mail at helpdesk@ufl.edu.
- Career Connections Center: Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services.
- Library Support: Various ways to receive assistance with respect to using the libraries or finding resources.
- Teaching Center: Broward Hall, 352-392-2010 or to make an appointment 352- 392-6420. General study skills and tutoring.
- Writing Studio: 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers.
- Student Complaints On-Campus: Visit the Student Honor Code and Student Conduct Code webpage for more information.
- On-Line Students Complaints: View the Distance Learning Student Complaint Process.

Course Overview

Week - Date	Topic	Assignments
Week 1 January 9	Virology Overview: <ul style="list-style-type: none"> ● Introduction to Viruses ● Virus Structure and Classification ● History of Viruses ● Viral Pathogenesis 	Syllabus and Course Intro Quiz (not graded) - course content will not open until this is taken and passed (80% or better) Week 1 Quiz assigned
Week 2 January 16	Overview of Viral replication: <ul style="list-style-type: none"> ● Infectious Cycle Overview ● Growth Cycle and MOI ● The Baltimore Scheme ● Viral Genomes ● Overview of RNA and DNA Genome Replication 	Week 1 Quiz due Week 2 Quiz assigned Discussion Board #1 assigned
Week 3 January 23	Viral Attachment and Entry: <ul style="list-style-type: none"> ● Overview of Viral Evolution ● Structure of Viral Particles ● Viral Attachment ● Viral Entry ● Viral Uncoating 	Week 2 Quiz due Week 3 Quiz assigned Honors Student Assignment #1 assigned
Week 4 January 30	SS (+) RNA viruses: <ul style="list-style-type: none"> ● Replication of ss(+) RNA viruses ● Epidemiology and Disease of: <ul style="list-style-type: none"> • Norovirus • non-Polio Enteroviruses • Coronavirus • Dengue and ADE 	Week 3 Quiz due Discussion Board #1 due Week 4 Quiz assigned Study Guide #1 assigned Exam 1 review Session
Week 5 February 6	SS (-) RNA viruses: <ul style="list-style-type: none"> ● Replication of ss(-) RNA viruses ● Epidemiology and Disease of: <ul style="list-style-type: none"> • Influenza • Rabies • Measles • Ebola virus 	Week 4 Quiz due Honors Student Assignment #1 due Study Guide #1 due Week 5 Quiz assigned Class Assignment #1: The Tale of 2 Pandemics assigned EXAM #1 window: Fri-Sat
Week 6 February 13	dsRNA viruses: <ul style="list-style-type: none"> ● Replication of dsRNA viruses ● Rotavirus Disease ● Blue tongue virus Disease 	Week 5 Quiz due Honors Student Assignment #2 assigned Week 6 Quiz assigned
Week 7 February 20	Retroviruses and RT DNA viruses: <ul style="list-style-type: none"> ● History and replication of retroviruses ● HIV Infection ● Infectious cycle of retroviruses ● HIV disease and epidemiology ● Replication of gapped dsDNA viruses ● Hepatitis B Disease 	Week 6 Quiz due Class Assignment #1: The Tale of 2 Pandemics due Week 7 Quiz assigned

<p>Week 8 February 27</p>	<p>ssDNA and dsDNA virus replication:</p> <ul style="list-style-type: none"> ● ssDNA virus replication ● Parvoviruses Disease ● dsDNA virus replication ● Herpes Infectious Cycle ● Pox Infectious Cycle 	<p>Week 7 Quiz due Honors Student Assignment #2 due</p> <p>Week 8 Quiz assigned Class Assignment #2: Viral Pathogen Write-up assigned</p>
<p>Week 9 March 6</p>	<p>dsDNA virus infection and disease:</p> <ul style="list-style-type: none"> ● Persistent Viral Infection ● Disease of: <ul style="list-style-type: none"> • Herpes Simplex Viruses • Epstein Barr Virus • Varicella Zoster Virus 	<p>Week 8 Quiz due</p> <p>Week 9 Quiz assigned Study Guide #2 assigned</p> <p>Exam 2 Review Session</p>
<p>Week 10 March 20</p>	<p>Oncogenic viruses and tumor virology:</p> <ul style="list-style-type: none"> ● Cancer Biology 101 ● Cellular Transformation and cancer ● History of Oncoviruses ● Human papillomavirus Disease 	<p>Week 9 Quiz due Study Guide #2 due</p> <p>Week 10 Quiz assigned Honors Student Assignment #3 assigned</p> <p>EXAM #2 window: Fri-Sat</p>
<p>Week 11 March 27</p>	<p>Gene therapy and Oncolytic viruses:</p> <ul style="list-style-type: none"> ● Introduction to gene therapy ● Engineering viruses to treat disease ● Adenoviruses and other viral vectors ● Oncolytic viruses 	<p>Week 10 Quiz due Class Assignment #2: Viral Pathogen Write-up due</p> <p>Week 11 Quiz assigned</p>
<p>Week 12 April 3</p>	<p>Vaccines and antiviral medications:</p> <ul style="list-style-type: none"> ● Viral vaccines ● Vaccines and Antiviral Drugs ● Hepatitis C Disease ● Influenza Antiviral Drugs 	<p>Week 11 Quiz due Honors Student Assignment #3 due</p> <p>Class Assignment #3: Viruses in the News assigned</p> <p>Week 12 Quiz assigned</p>
<p>Week 13 April 10</p>	<p>Viruses of Microbes:</p> <ul style="list-style-type: none"> ● Viruses of Bacteria and Phage Therapy ● The Microbiome ● The Virome 	<p>Week 12 Quiz due</p> <p>Week 13 Quiz assigned</p>
<p>Week 14 April 17</p>	<p>The role of viruses in non-viral diseases:</p> <ul style="list-style-type: none"> ● Enteric viruses in Chronic Intestinal Disorders ● Viruses and Type I Diabetes ● Viruses and Neurodegenerative Disorders 	<p>Week 13 Quiz due Class Assignment #3 due</p> <p>Week 14 Quiz assigned Study Guide #3 assigned</p> <p>Exam 3 review Session</p>
<p>Week 15 April 24</p>	<p>Exam 3</p>	<p>Week 14 Quiz due Study Guide #3 due</p> <p>Exam #3 window: Tues - Wed</p>
<p>Exam Week May 1</p>	<p>Final Exam (OPTIONAL)</p>	<p>Final Exam window: Tues - Thurs</p>