General Virology
MCB 4503/5505
Syllabus subject to change

Course Description: This course is for undergraduate students and is designed to introduce you to the field of virology. We will cover the components of viruses, their replication strategies, and the human diseases caused by common and emerging pathogens. Additional topics include viruses of other organisms, including plants and microbes. This course will also cover the importance of viruses in maintenance of human health (e.g. the virome, gut homeostasis), how viruses can be manipulated by scientists for the treatment of disease, and economic and environmental impacts of viruses.

Course Goals: Upon completion of this course, you should have a solid knowledge of the basic characteristics of viruses, including the mechanisms of infection and replication for each type of viral genome. You should also be able to name viruses belonging to each viral genome category and be able to describe replication strategies, along with disease and transmission characteristics if applicable.

Instructor:
Dr. Sarah Doore
Assistant Professor
Dept. of Microbiology and Cell Science
Phone: 352-846-0953
Email: messaging through Canvas is preferred; send accommodation letters to sdoore@ufl.edu

Office Hours: Office hours will be held via Zoom on **Tuesdays** from **2 to 3 PM EST** or by appointment. When emailing to request an appointment, provide **three** potential days/times for the meeting and your instructor will select one. Meetings can be held in person or via phone or Zoom.

Communication: Questions should be submitted to TAs or the FAQ board of the Canvas page prior to messaging your instructor with a question. Instructor typically responds to these within 48hrs.

Prerequisites: Microbiology, Genetics, Biochemistry or Molecular Biology course

Teaching Assistants: Names and email addresses can be found on the course Canvas page.

Required Textbook: Principles of Virology: Volume I, 5th edition (2020) Authors: S. Jane Flint, Vincent R. Racaniello, Glenn F. Rall, Anna Marie Skalka, Lynn W. Enquist; ISBN 978-1-683-67284-5 (print) or 978-1-683-67360-6 (electronic). There is a copy of the textbook for *in-library use* through Course Reserves at the UF Marston Science Library. Check ARES at https://ares.uflib.ufl.edu/ares/ares.dll for more information.

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 are only guaranteed for the edition noted above. If you are interested in a thorough accessory textbook, Fields Virology is a wonderful resource. Fields 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 which 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 quizzes, assignments, discussion posts, study guides, and examinations. The quizzes and study guides are designed to serve as a review of key material and focus your study for the larger examinations.

Grading: Below is the breakdown for point values of each of the different course components.

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

MCB 5505 / MCB 4503 Honors	
Assignment	Points
Quizzes (x14, 4 pts each)	56
Exams (x3, 90 pts each)	270
Study Guides (x3, 40 pts each)	120
Class assignment #1	60
Class assignment #2	30
Class assignment #3	30
Discussion post	15
Article analysis (x3, 25 pts each)	75
Total Points	656

Grading scale: The cutoffs for letter grades are as follows:

	Percentage		Percentage
A	93.0 – 100.0	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.
**Canvas does not always calculate grades correctly. It is recommended that you calculate your own percentage to be sure you know your accurate grade.

You can find UF's grading policies at https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/

Quizzes: There will be a short quiz assigned each week, with 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 11:59pm 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 11:59pm EST but not completed until after that time, it WILL be marked late. For each day the quiz is late, 10% will be deducted from the total score.

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 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. Therefore, a **mandatory syllabus 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 final given during exam week. The final is optional and the score from the final may be used to replace a lower 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 by Honorlock. Instructions for scheduling your proctored exam may be found on the homepage of the course and are also provided on the Canvas Orientation Modules.

Assignments: At the beginning of the semester each student will choose one virus that they will use to complete specific assignments over the course of the semester. It is suggested that students pick well characterized or heavily studied viruses as this will make the task of finding information about them significantly easier. All assignments are individual projects used to expand your knowledge base of a particular virus. Completed assignments will be uploaded as documents to Canvas. These are NOT group assignments and students are expected to write their reports 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 is not tolerated.

Honors writing assignments: Throughout the semester, honors and graduate students will be assigned peer-reviewed papers to read and analyze. There are provided guidelines for how analysis of the papers should be completed. During the semester, students will submit 1-2 page reports on the topics covered. These reports will be submitted through Canvas.

Discussion Board: All students are expected to participate in their group's discussion board assignment. 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 prior to opening the post. Keep in mind that this is NOT a group assignment, but rather a way of better facilitating discussion through smaller groups.

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. Doore will post the study guides from the best 3-4 groups. These will serve as your study guides for the exam.

Student Groups: Depending on the size of this course, the class will be divided into groups of approximately 10 students, with each group assigned to a specific TA. The purpose of these groups is to aid in timely answering of questions regarding assignments and course content. For questions regarding the course material, please contact your TA for clarification or explanation. If you 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 to the instructor directly.

Artificial Intelligence: There are situations and assignments in which the limited use of AI is acceptable. Please keep in mind that the Honor Code (see below, "Academic Honesty") applies for all components of the course, including any use of AI. For example, using AI to suggest a virus to write about and list its defining characteristics is fine. Using AI to write a paper and then submitting that paper without fact-checking or proofreading is <u>not</u> fine. You are expected to do your own research, analyze the quality of resources, and communicate your findings. If you use AI, please indicate where and how, cite the tool used, and/or include quotes from the exchange.

Readings: Each week there will be "required" and "suggested" or "optional" portions of the textbook assigned. Required readings are important for you to know but are not 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 2 points of extra credit per exam. Dr. Doore 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 assignment submission 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 or quiz is late, 10% will be deducted from the total score**.

Library access: The university library has access to most 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 UF libraries website: http://library.health.ufl.edu. However, the student must be on the UF network (on campus or through the UF VPN remotely) to do this. Instructions for accessing the UF VPN will be 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). 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, 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 Help 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 the UF Police Department website or call 352-392-1111 (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.

Week - Date	Topic	Assignments
Week 1 August 23	Virology basics: • What are viruses • History of virus discovery • Virus classification • Overview of replication	Syllabus and intro quiz – course content will not unlock unless this is taken and passed with a score of at least 80% Week 1 Quiz assigned
Week 2 August 30	Viral replication: • Overview of the Baltimore Scheme • General strategies of genome replication • Infection cycles • Mechanisms of evolution	Week 1 Quiz **due** Week 2 Quiz assigned Class assignment #1: Virus species write-up assigned
Week 3 September 6	Mechanisms of attachment and entry: • Binding to host receptors • Mechanism of direct genome entry • Mechanism of receptor-mediated endocytosis • Mechanism of membrane fusion	Week 2 Quiz **due** Week 3 Quiz assigned Honors assignment #1 assigned

Week 4
September 13
	ss(+)RNA viruses:
	• Infection cycle and replication strategies of picorna- and alphaviruses
	• Epidemiology and disease of:
	  ○ Norovirus
	  ○ Zika
	  ○ Coronavirus
	  ○ Dengue
		Week 3 Quiz **due**
		
		Week 4 Quiz assigned

Week 5 September 20	Group VI reverse transcribing ssRNA viruses and integration: • Infection cycle and replication strategies of HIV and lentiviruses • Epidemiology and disease of HIV • Endogenous retroviruses	Week 4 Quiz **due** Week 5 Quiz assigned Honors assignment #2 assigned Exam 1 Review Session

Week 6
September 27
	ss(-)RNA viruses:
	• Infection cycle and replication strategies of vesicular stomatitis virus and influenza
	• Epidemiology and disease of:
	  ○ Influenza
	  ○ Rabies
	  ○ Mumps
	  ○ Ebola
		EXAM #1 WINDOW: SEP 29 – OCT 1
		
		Week 5 Quiz **due**
		Honors assignment #1 **due**
		
		Week 6 Quiz assigned
		Class assignment #2: A Tale of Two Pandemics assigned

Week 7 October 4	dsRNA and ssDNA viruses: • Infection cycle and replication strategies of reo-, circo-, and parvoviruses • Epidemiology and disease of: ○ Rotavirus	Week 6 Quiz **due** Honors assignment #2 **due**

	○ Fifth disease	Week 7 Quiz assigned
Week 8 October 11	Group VII reverse transcribing dsDNA viruses • Infection cycle and replication strategies of hepadna- and caulimoviruses • Epidemiology and disease of: ○ Hepatitis C virus ○ Cauliflower mosaic virus	Week 7 Quiz **due** Class assignment #2: A Tale of Two Pandemics **due** Week 8 Quiz assigned Honors assignment #3 assigned
Week 9 October 18	dsDNA viruses: • Infection cycle and replication of pox, herpes, adenovirus, and tailed bacteriophage • Epidemiology and disease of: ○ Poxviruses ○ Herpesviruses ○ Adenovirus	Week 8 Quiz **due** Week 9 Quiz assigned Exam 2 Review Session
Week 10 October 25	Oncogenic viruses and tumor virology • Overview of cancer and tumors • Infection cycle and replication of oncogenic viruses • Mechanisms of transformation and characteristics of cancer cells	**EXAM #2 WINDOW: OCT 27 – OCT 29** Week 9 Quiz **due** Honors assignment #3 **due** Week 10 Quiz assigned
Week 11 November 1	Vaccines and antivirals • Overview of vaccines and vaccine types • Specific vaccines for: ○ MMR ○ Influenza ○ HPV ○ SARS-CoV-2 • Research and development of antivirals • Specific antivirals for: ○ Influenza ○ Herpes ○ HIV ○ SARS-CoV-2	Week 10 Quiz **due** Week 11 Quiz assigned Class assignment #3 assigned
Week 12 November 8	Virus therapy and oncolytic viruses • Overview of viruses used for: ○ gene therapy ○ phage therapy ○ viral vectors ○ oncolytic therapy • Mechanisms of treatment • Current areas of research and future directions	Week 11 Quiz **due** Class assignment #1: Virus Species Write-up **due** Week 12 Quiz assigned Discussion post assigned
Week 13 November 15	Viruses of microbes • Bacterial viruses • Giant viruses	Week 12 Quiz **due**

	• Archaeal viruses • Extremophile viruses	Week 13 Quiz assigned
Week 14 November 22	Bacteriophages and the virome • Ecology and horizontal gene transfer mediated by dsDNA phages • Auxiliary metabolic genes • Effect of phages on biogeochemical nutrient cycling • ssDNA viruses in the microbiome and implications for human health	Week 13 Quiz **due** Discussion post **due** Week 14 Quiz assigned Exam 3 review session
Week 15 November 28	Make-up week (Week 14 continued) Exam 3	**EXAM #3 WINDOW: DEC 1 – DEC 3** Week 14 Quiz **due**
Exam Week December 6	Final exam - optional	**FINAL EXAM WINDOW: DEC 9 – DEC 12**