**Comparative Virology   11:126:407 Fall, 2021**

**Grades and Course Requirements**

A total of **400** points are possible:

Exams 1-3 and Final Exam: **100** points each – **we count the best 3 out of the 4: 300** total points.

Project and write-up – **100** points. This year’s class projects are student-led discussions described below and explained further the first day of class.

**Note: We allow you to drop an exam, so we do not give make-up exams for any reason other than catastrophic circumstances such as prolonged illness, for which we will require documentation. You may choose to skip an exam for any reason such as illness, conflict with other exams, family issues, etc., but we strongly disrecommend skipping an exam because you think you’re going to do badly. You may be skipping the easiest exam we give.**

**Also, any student who has a high enough point total on the first three exams plus the project score to be guaranteed an A for the course grade will be informed of that on the last regular day of class (well before the final exam) and won’t have to take the final. The Final Exam is comprehensive, but will emphasize the latter portion of the course.**

**Class Projects: Student-led Presentations and discussions**

We will stop lecturing 20 minutes before the end of each class period to allow time for student-led discussions. Each student in the course will do a short presentation and lead a discussion on a topic involving SARS-CoV-2/COVID-19. These topic areas have already been chosen and the tentative schedule is attached. They are meant to cover many aspects of the SARS-CoV-2 virus and the COVID-19 pandemic. There are many high-quality resources available for each of the topics, so you should have no problem finding information. Please check in with us to make sure you’re on the right track with your background search and the presentation.

The presentation itself should be **no more than 6 minutes long**, allowing plenty of time for follow-up questions and discussion. The discussion is meant to be a major part of the project, and you should be prepared to help lead it. We will help lead as well. To facilitate the discussion, you should have a few questions that you think are interesting for further discussion, for example questions that are important but have not been answered by the research to date.

**Paper summarizing discussion topic**

Each student will also provide a 4-5 page, double-spaced paper summarizing the presentation, with additional background material, and will provide copies of material used for the presentation (e.g., PowerPoint slides or video, etc.). At least 5 references are required, in the approved format as described below. A minimum of two of the references must be from [refereed journal articles](https://guides.lib.vt.edu/c.php?g=134398&p=880869).  A good place to start is by looking your topic up on [Google Scholar](https://scholar.google.com/). All of the relevant information in your paper should be referenced and cited. In other words, if you make a statement that is not based on information that is common knowledge or that was covered in class, the reference for the statement should be cited in your paper, and we should be able to find the information (see note\* about plagiarism below). **Your presentation outline and resources must be cleared with Dr. Hillman or Dr. Tumer no later than one week before the presentation. If you have PowerPoint or video files, those files containing the presentation must be provided to Dr. Hillman or Dr. Tumer by 4:30 PM the day before the presentation.** Presentations will be graded on organization, quality of information, and delivery, and on the quality of the accompanying paper.

**Format for references in papers:**

Hillman, B. I., Foglia, R., and Yuan, W. 2000. Satellite and defective RNAs of *Cryphonectria hypovirus 3*, a virus species in the Family *Hypoviridae* with a single open reading frame. *Virology* 276, 181-189.

Hudak, K., Wang, P. and Tumer, N. E. 2000. Pokeweed antiviral protein inhibits translation of capped mRNAs independently of ribosome depurination by acting directly on the RNA template. *RNA* 6, 1-12.

Citation in text to references should be of the form: (Hillman *et al*., 2000; Hudak *et al*., 2000), for example.

**\*Note about plagiarism**: Plagiarism is representing words or ideas that are not original as if they were your own original words for a given work. Included in plagiarism, incidentally, is self-plagiarism: an example is representing something you wrote previously for another publication or assignment (for example, for another course) as if it were done as an original work for an unrelated publication or assignment (for example, this course). **If you want to use part of a paper you wrote previously for another course assignment, check with us first**. You are all aware that internet searches and resources such as Turnitin make it very easy to detect even single sentences that were written by someone else. The possible benefit to you of incrementally supplementing your grade by a few points through plagiarism or other forms of cheating is really not worth the risk of failing this course. If you have question about what plagiarism is, please check with us.

**Text and resources for the course:**

**Text**: The text we use is [Understanding Viruses](https://www.amazon.com/Understanding-Viruses-Teri-Shors/dp/1284025926) by Teri Shors (Jones and Bartlett) as primary text. We don’t follow it closely, but recommend it so that you have a stable resource. We recommend the Third Edition, but the Second Edition is OK as well.  These can be purchased relatively inexpensively online.

For those of you who may see a career in virology or a related field, especially regarding human disease, [Principles of Virology](https://www.wiley.com/en-us/Principles%2Bof%2BVirology%2C%2BMulti%2BVolume%2C%2B5th%2BEdition-p-9781683673583) by Flint and others is excellent. It’s more expensive than Shors’ book, but has been out for a year and can be bought used.

**Some useful web sites:**

Many terrific online resources are available now, below are a few:

**General**

[www.microbe.tv/twiv](http://www.microbe.tv/twiv%22%20%5Ct%20%22_blank) This is the best general resource, link to courses and podcasts

<http://www.virology.net> Originally excellent, now dated and not really maintained

<http://www.virology.wisc.edu/> Large virology faculty, links to several good resources

<https://www.youtube.com/user/profvrr> Prof. Racaniello links to his and other courses

**The Microbe TV website developed and maintained by Prof. Vincent Racaniello is particularly useful. It contains more than 800 (and counting) episodes of This Week in Virology (TWiV) and links to his course lectures. You should use that site and its resources liberally throughout the semester.**

**Virus Taxonomy and Nomenclature**

Chris Upton, Viral Bioinformatics Research Centre <https://4virology.net/>

International Committee for the Taxonomy of Viruses (ICTV) <https://talk.ictvonline.org/>

**Virus Structure**

VIPER <http://viperdb.scripps.edu/>

**Virus Sequence Information**

National Center for Biotechnology Information (NCBI) <http://www.ncbi.nlm.nih.gov/>

 <https://www.ncbi.nlm.nih.gov/genome/viruses/>

**Coronavirus**

Johns Hopkins University Coronavirus Center <https://coronavirus.jhu.edu/>

This site has been among the best since the beginning of the pandemic.

Rutgers University Coronavirus Information Site – our local site <https://coronavirus.rutgers.edu/>

World Health Organization (WHO) <https://www.who.int/>

U.S. Centers for Disease Control and Prevention (CDC) <https://www.cdc.gov/>

**Viruses that you should be familiar with by the end of the course:**

*Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2; Coronaviridae)*

*Severe acute respiratory syndrome coronavirus (SARS-CoV; Coronaviridae)*

*Middle East respiratory syndrome coronavirus (MERS-CoV, Coronaviridae)*

*Poliovirus (Picornaviridae)*

*Zika virus (Flaviviridae)*

*Hepatitis C virus (Flaviviridae)*

*Tobacco mosaic virus (Tobamovirus)*

*Brome mosaic virus (Bromoviridae)*

*Tobacco etch virus (Potyviridae)*

*Rabies virus (Rhabdoviridae)*

*Measles virus (Paramyxoviridae)*

*Ebola virus (Filoviridae)*

*Hantavirus (Bunyaviridae)*

*Influenza virus (Orthomyxoviridae)*

*Bluetongue virus (Reoviridae)*

*Rotavirus (Reoviridae)*

*Human immunodeficiency virus 1 (Retroviridae)*

*Cauliflower mosaic virus (Pararetrovirus – Caulimoviridae)*

*Hepatitis B virus (Hepadnaviridae)*

*Tomato yellow leaf curl virus (Geminiviridae)*

*Human adenovirus 1 (Adenoviridae)*

*Simian virus 40 (Polyomaviridae)*

*Human herpesvirus 1 and 2 (=Herpes simplex 1 and Herpes simplex 2)*

*Human herpesvirus 3* (= *Varicella-zoster virus*, chicken pox; *Herpesviridae*)

*Smallpox virus (Poxviridae)*

*Vaccinia virus (Poxviridae)*

*African Swine Fever Virus (Asfarviridae)*

*Baculovirus (Baculoviridae)*

*Potato spindle tuber viroid (Pospiviroid)*

Bovine spongiform encephalopathy (BSE) prion

**Some questions you should be able to answer by the end of the course:**

What are the major types of viruses described in this course? What are the main features of their replication, biology, and pathology?

What are some of the major weapons that viruses use to compromise and facilitate infection in their hosts?

What are some of the different mechanisms that various host organisms use to protect themselves against virus infection?

What are the major means by which viruses are transmitted from an infected host to a healthy host?

How do viruses move within different host organisms?

What are some of the major properties of virus structure and composition?

What are some of the major features of virus evolution?

**Comparative Virology   11:126:407 Fall, 2021**

**Room 100 Art History Hall, Douglass Campus**

**Tuesday Friday 11:00-12:20**

**TENTATIVE SCHEDULE JUNE 2021**

**BIH = Dr. Hillman lecture; NET = Dr. Tumer lecture**

1. Fri Sept. 3           BIH – Course Introduction and Introduction to Virology

2. Tue Sept. 7            BIH – Advances in Virology and Biology (History of Virology)

3. Fri Sept. 10          NET – Viral translation

4. Tue Sept. 14       NET – Viral genomes/replication

5. Fri Sept. 17         BIH – Composition Structure, and Taxonomy

6. Tue Sept. 21      BIH – Virus Methods and Techniques

7. Fri Sept. 24         NET – Virus Diagnostics – Mike Pierce

8. Tue Sept 28 BIH – Virus Ecology, Evolution, and Transmission 1

9.  Fri Oct.  1        **EXAM 1**

10. Tue Oct.  5         BIH – Virus Ecology, Evolution, and Transmission 2

11.  Fri Oct. 8     BIH – Virus Ecology, Evolution, and Transmission 3 – Dr. Dana Price

12.  Tue Oct. 12      BIH – RNA Viruses 1

13. Fri Oct. 15    BIH – RNA Viruses 2

14.  Tue Oct. 19       BIH – RNA Viruses 3/DNA Viruses 1

15.  Fri Oct. 22        BIH – DNA viruses 2

16.  Tue Oct. 26      BIH – DNA Viruses 3

17.  Fri Oct. 29       **QUIZ 2**

18.  Tue Nov.  2        BIH – Marine viruses 1 (Dr. Kay Bidle)

19. Fri  Nov. 5       BIH – Marine viruses 2 (Dr. Kim Thamatrakoln)

20. Tue   Nov. 9       NET – Picorna, Flavi, Alpha

21. Fri    Nov. 12       NET – Host resistance to viral infection

22. Tue   Nov. 16 NET – Retroviruses 1

28. Fri Nov. 19NET – Retroviruses 2

27. Tue   Nov. 23 **QUIZ 3**

23.  Tue   Nov. 30    NET – Retroviruses 3 and PDB analysis of HIV (Dr. Shuchi Duda)

24.  Fri   Dec. 3    NET – Bacteriophages/Toxins

25. Tue    Dec. 7     NET – Plant viruses

26.  Fri   Dec 10       BIH – Prions, viroids, satellites, defective viruses

**Final Exam: TBD, 100 Art History Hall**

Note: This schedule **will be modified** as the semester progresses. For example, we **will add and change student presentation dates** and **we may add invited** speakers. You will be given sufficient warning of any major changes. A course web site will be up by the end of the first week.