

# Virology BIMM114

## Winter 2020

**Location:** Center Hall (CENTR) 119

**Date/Time:** Mondays, Wednesdays and Fridays from 12:00pm-12:50pm

**Instructor:** Matt Daugherty

Office hours: Wednesday 2:00pm-3:00pm in Tata Hall 3101

Email: [MDDaugherty@UCSD.edu](mailto:MDDaugherty@UCSD.edu) (Put BIMM114 in the subject line!)

### Course Summary:

Viruses are responsible for numerous human illnesses and millions of deaths annually. Some of the most feared, widespread and devastating human diseases such as smallpox, influenza, dengue fever, yellow fever, measles and AIDS (Acquired immunodeficiency syndrome) are caused by viruses. Similarly, viruses cause a number of recently emerging diseases, including Ebola hemorrhagic fever, severe acute respiratory syndrome (SARS), Zika virus infection and influenza pandemics. In addition, viruses infect animals, plants and insects of importance to humans, where they can have tremendous consequences for the world economy and environment. During this quarter, we will explore the complex biology of viruses, their life cycle and pathogenesis, how they evade the immune system and how they often disable or kill their host. We will cover the history of virology, general principles of viral infections, and specifics of viral families with emphasis on individual viruses that have changed human history, are currently major health burden and/or represent a serious threat for mankind.

**Prerequisites:** BIMM100 (Molecular Biology), and its prerequisites.

**Course website:** Available on Canvas

### Textbook:

The **required** textbook is *Fundamentals of Molecular Virology, 2nd edition* by Nicholas Acheson. Mandatory reading assignments, indicated on the schedule, are associated with every lecture. The reading assignments should be completed before the corresponding lecture. This will significantly contribute to your understanding of the lecture, even if you did not understand all the material the first time you read it. Do not be discouraged. It is normal for new understandings to develop over multiple exposures to any novel material. Research in psychology has shown that students who read before coming to lectures gain far more from the lecture than those who do not. Further reading material from outside sources will be posted on the Canvas website and announced in class.

An eBook of the textbook is available as a purchasing option for this course. The digital course materials are provided through Canvas and are free for the first two weeks of classes. After two weeks, your student account will be charged unless you opt out. If you decide to opt out you must complete the process by Saturday, January 18<sup>th</sup> 2020. More information can be found here:

<https://ucsandiegobookstore.com/t2-inclusiveAccess.aspx>

### Lectures:

Lectures will provide information not contained in the reading and are important to get a perspective on the most important aspects of each topic that will be evaluated in the exams. Please note that the indicated schedule and readings may be modified somewhat during the quarter, and any changes will be announced in lecture. Lecture slides will be posted on the class website <24 hours after the lecture, with all attempts to make them available before class. However, these notes are not intended to replace lecture, as there will likely be material presented in class that does not appear in the lecture slides. You will be responsible for information provided in lecture in addition to the material assigned in the text.

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**Podcast:** This course will be available at [podcast.ucsd.edu](http://podcast.ucsd.edu)

### Classroom etiquette:

Because this is a lecture class, minimizing distractions is important. Please have respect for your classmates and the instructor by silencing cell phones and other electronic devices, not talking, and minimizing other distracting activities in class.

### Office hours with Dr. Daugherty:

Wednesday 2:00pm-3:00pm in Tata Hall 3101. Office hours will be held every week except the first week of class and when there has been an exam that day. I would be happy to talk with you about the class, virology in general, science and your studies.

### Email communication:

Please put BIMM114 in the subject and remember to include your first and last name in the body of the email. I will not respond to any questions regarding the content of the exams by email or answer lengthy questions on course material, or schedule a meeting with you or anything else that can be done in person before/after class or during office hours. I will address questions about the course material during office hours.

### Instructional assistants:

We have a great set of IAs for the class this year. They are:

IA	Email	Office hours	Location
Chris Beierschmitt	<a href="mailto:cbeiersc@ucsd.edu">cbeiersc@ucsd.edu</a>	Mondays 2:00 - 3:00pm	Mandeville coffee cart
Connon Lennan	<a href="mailto:clennan@ucsd.edu">clennan@ucsd.edu</a>	Fridays 2:00 - 3:00pm	HSS 1145L
Jaxon Wagner	<a href="mailto:jdww035@ucsd.edu">jdww035@ucsd.edu</a>	Mondays 3:00 - 4:00pm	NSB, 5 <sup>th</sup> floor 'kitchen'
Xaver Audhya	<a href="mailto:xaudhya@ucsd.edu">xaudhya@ucsd.edu</a>	Thursdays 3:00 - 4:00pm	NSB, 5 <sup>th</sup> floor 'kitchen'

Please make sure you include "BIMM 114" in all email correspondence.

### Discussion sections:

Discussion sections are a valuable part of this course, and attendance will be worth 5% of your final grade. These sections serve to clarify, emphasize and expand points that have been introduced in lecture. The IAs will craft each meeting to include opportunities for problem-solving, discussion, and expansion on particularly timely topics. There will be no sections the first week of class, the week of January 20 or the week of February 17. Please attend the section you are assigned to due to space limitations in the classroom and so that the IAs can assess attendance.

Section	Day	Time	Room	IA
A01	Mon	4:00 - 4:50pm	CENTR 217B*	Chris
A02	Mon	5:00 - 5:50pm	CENTR 217B*	Chris
A03	Mon	6:00 - 6:50pm	CENTR 217B*	Xav
A04	Mon	7:00 - 7:50pm	CENTR 217B*	Xav
A05	Mon	8:00 - 8:50pm	CENTR 217B*	Connor
A06	Fri	4:00 - 4:50pm	SOLIS 105	Jaxon
A07	Fri	5:00 - 5:50pm	SOLIS 105	Jaxon

\* - starting the week of January 27, these sections will be held in CENTR 217A.

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#### Clickers:

To enrich your learning experience through class participation, I will use clickers in lectures. You are required to purchase an iClicker remote (available in bookstore) and register it online for in-class participation. We will start using clickers in the second or third week, so please register your clicker before January 13th. You will be graded for participation, not based on correct answers, although I encourage you to take the questions seriously as they are examples of questions I might ask on an exam. Participation in clicker questions will count for up to 5% of your final grade, with points being scaled according to how many questions you answer throughout the quarter. You will be allowed to miss 20% of the clicker questions and still get full credit. Please remember that bringing a clicker for a classmate is considered cheating and both students will receive a failing grade in the class and be referred to the Office of Academic Integrity for administrative discipline.

#### Films:

There will be two films that will be required viewing in this course that need to be viewed on your own time. Links to these are posted in a "films/podcasts" folder on Canvas and say "required" next to them. There are also links to some additional films/podcasts provided purely for your own interest, but not required. Films will be available online, streaming from library reserves or directly from the producer's web site. When accessing films through UCSD library reserves, you *must* access the films from within the UCSD protected network, or use a VPN if you are off campus.

#### Review sessions:

I am attempting to schedule review sessions to be held from 5:00pm - 7:00pm the Tuesday before each of the two midterms and the Tuesday before the final exam. When I have confirmation of times and rooms, details will be updated on this syllabus and will be announced on the course website.

#### Exams and grading:

Your performance in the course will be evaluated by two in-class midterm exams, the final exam, iClicker participation and section attendance. Exam and grading policies are as follows: Exams will consist of fill in the blank, short answer, multiple choice, and short essay questions. Pens and an ID card (student ID or driver's license) will be required at every exam. There are no scheduled make-up exams. Failure to take the exam will result in a zero. Extraordinary circumstances preventing you from taking an exam must be discussed in >24 hours in advance with the Student Affairs Office (1128 Pacific Hall) and Professor Daugherty. If exceptions are made for these special circumstances, the make-up will be an ORAL or ESSAY exam given by Professor Daugherty. There will be only one final given, I am sorry but it is impossible to accommodate those with multiple finals on the same day.

Midterm I: Given in class on January 29. Worth 25% of your grade. Will cover all lecture and reading material assigned for lectures 1-9.

Midterm II: Given in class on February 19. Worth 25% of your grade. Will cover all lecture and reading material assigned for lectures 11-17.

Final: Given on **March 18 11:30am – 2:30pm**. Worth 40% of your grade. Covering all lecture and reading material assigned the entire class with emphasis on material and reading assigned for lectures 19-28.

Clickers/participation: Worth 5% of your grade. Starting in the second or third week of lectures, there will be questions during class that will be answered with your clicker. You will be graded for participation, not based on correct answers. Points will be scaled according to participation. You will be allowed to miss 20% of the clicker questions and still get full credit.

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Section participation: Attendance in review sections will be worth 5% of your grade. Starting in the second week, IAs will run discussion sections that will highlight and expand upon pertinent material from the previous week. IAs will assess attendance through written responses to short answer questions. You will be graded for participation, not based on your answers, as many questions may be open-ended. Due to Monday holidays, all sections will be canceled twice this quarter (week of Jan 20 and Feb 17). Therefore, everyone must attend at least six sections to earn maximal points.

Viruses In The News! To encourage you to apply your newfound virology knowledge to things you read/hear in the news, you can earn up to 5% extra credit on your final exam grade at any point in the quarter by identifying an article from a credible popular news source about emerging viruses and emailing me a brief (2-3 pages or 1000-2000 words) summary of the article, its relevance to the course, and why you found it interesting/newsworthy. Please include either the link to the article or the full article in your summary, and email this to me as a PDF including 'BIMM 114 – Viruses in the News' in the subject line of the email. The article should be from sometime in 2019 or 2020. Judging of merit in these cases is entirely subjective and will be primarily used to help decide grades on the borderline. Examples of credible popular news sources include (but are certainly not limited to): NPR, NY Times, National Geographic, and BBC, but does not include BuzzFeed, People magazine, or some random thing you heard someone say.

### **Grading policy:**

Grading is normalized to the highest score in the class (prior to any extra credit). 60-70% of that score will be a D, 70-80% will be a C, 80-90% will be a B and 90-100% of that an A. If everyone does well, then it would possible for the whole class to receive A's or at least a high B; however, given the challenging nature of the material, this is unlikely. You are not competing with your fellow students. There is no shortage of high grades for those who do well. It is my hope that everyone will study hard enough to demonstrate sufficient knowledge of Virology to earn an A or B. However, do not rely on your peers doing poorly...it is you against the material. If you have concern about your grade or performance on an exam you must address this with me within one week of the exam, no exceptions. DO WORK THAT YOU WILL BE PROUD OF AND STAND BY YOUR PERFORMANCE.

### **Regrading policy:**

Exams must be written in pen ONLY (no pencil) or will not be accepted for regrade. Exams written in pen but having writing masked by any form of white-out or correction tape will not be accepted for regrade. To submit a request for a regrade, you must:

1. Write a cover letter specifying which specific problem should be looked at and fully describe why you think the problem was wrongly graded. I will consider no more than three "potential" errors per exam.
2. Include your email address in your cover letter so that I can contact you regarding the decision on the regrade.
3. Attach the cover letter to the exam and deliver to Dr. Daugherty. The regrade request must be delivered within 1 week after the graded exams are returned. If you submit an exam for a regrade, I may choose to regrade the entire exam. If I think the grading was too generous, for the sake of accuracy I reserve the right to *lower* your score.
4. Please be advised that a random sampling of exams will be photocopied. If exams submitted for regrade are found to be altered, this will be considered a breach in academic honesty and will result in failure of the course.

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### Academic integrity:

Work on exams must be solely your own. Cheating will not be tolerated and will result in an F in the course, as well as any additional disciplinary actions as indicated by the policy to maintain academic honesty. Please note, letting someone cheat off of your exam is cheating!

Please review UCSD's Policy on Academic Integrity:

<http://senate.ucsd.edu/Operating-Procedures/Senate-Manual/Appendices/2>

### How can I succeed in BIMM 114?

1. **Read** the assigned pages before lecture. You will understand the lectures better. You will learn more from the clicker questions. The lecture will be based upon the reading, but there will not be enough time to cover every detail in class. Nevertheless, you are accountable for all reading on the exams. If you bump into material that is too technically challenging, *don't get bogged down*. Skip it (temporarily). Return to the most difficult material later.
2. **Outline** the important points as you read on index cards or a notebook. This will help you remember the flow of information and contextualize the details.
3. **Come** to class and sit toward the front. Participate in clicker questions and discussion.
4. **Listen** to the podcast.
5. **Review** your notes and the lecture slides. Slides will NOT contain the instructor's notes. They will contain announcements, illustrations, diagrams, and photos which augment the lecture. They will be posted after each lecture. You are accountable for everything in the lecture slides.
6. **Study in groups**. You are encouraged to study with other students in the course. However, work on exams must be solely your own. See "Academic Integrity" statement above.
7. **Go** to your discussion section and office hours. There will be opportunities to review the material, ask questions, and work on problem sets.
8. **Engage** with the material. If you are curious and invested in learning about virology, you have a much higher chance of absorbing and retaining the material and getting a good grade.

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## Class schedule:

Date	Session	Topic	Relevant reading
Jan 6	1	Introduction & history	pg. 2-9, 312-313
Jan 8	2	Methods	pg. 9-11
Jan 10	3	Structure	pg. 18-27
Jan 13	4	Classification	pg. 31-40
Jan 15	5	Replication cycle	pg. 11-17, 26-30 and Chapter 4
Jan 17	6	Replication cycle II	pg. 11-17, 26-30 and Chapter 4
Jan 20	No class	Martin Luther King, Jr. holiday	
Jan 22	7	Host defense	Chapter 33
Jan 24	8	Host defense II	Chapter 34
Jan 27	9	Evolution	pg. 40-44, outside reading*
<b>Jan 29</b>	<b>10</b>	<b>Midterm I</b>	
Jan 31	11	+ss RNA: Picornaviruses	Chapter 11
Feb 3	12	+ss RNA: Flaviviruses	Chapter 12
Feb 5	13	+ss RNA: Toga- and coronaviruses	Chapter 13 & 14
Feb 7	14	-ss RNA: Paramyxo- and filoviruses	Chapter 15 & 16
Feb 10	15	-ss RNA: Arena and bunyaviruses	Chapter 17
Feb 12	16	-ss RNA: Orthomyxoviruses	Chapter 18
Feb 14	17	ds RNA: Reoviruses	Chapter 19
Feb 17	No class	Presidents' Day holiday	
<b>Feb 19</b>	<b>18</b>	<b>Midterm II</b>	
Feb 21	19	Small dsDNA: Polyoma- and papillomaviruses	Chapter 21 & 22
Feb 24	20	Large dsDNA: Adeno- and herpesviruses	Chapter 23 & 24
Feb 26	21	Large dsDNA: Poxviruses	Chapter 26
Feb 28	22	Hepatitis B virus (HBV)	Chapter 30
Mar 2	23	Retroviruses	Chapter 28
Mar 4	24	Human immunodeficiency virus (HIV)	Chapter 29
Mar 6	25	Vaccinies/antiviral drugs	Chapter 35 & 36
Mar 9	26	Ebola outbreaks and vaccine development	Outside reading*
Mar 11	27	Dengue and Zika: global emergence and vaccines	Outside reading*
Mar 13	28	Genetic susceptibility to viral infection	Outside reading*
<b>Mar 18</b>	<b>Final exam - 11:30am - 2:30 pm</b>		

\* - outside reading will be posted on the course website the week before the class for which it is assigned

**Please note the dates of the midterms and final. There will be no make-up exams possible.**