Virology BIMM114
Winter 2022

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, measles and AIDS (Acquired immunodeficiency syndrome) are caused by viruses. More recently, viruses cause a number of new emerging diseases, including COVID-19, Ebola hemorrhagic fever and Zika virus infection. 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.

Date/Time: Tuesdays and Thursdays 2:00-3:20pm

Location and Zoom details:
This course will be taught in person (when possible) and over Zoom.
The first four lectures will be entirely over Zoom.
The Zoom link for the course will be available on Canvas. **You will need to sign in through your UCSD account**. If you do not have a UCSD account, please let me know and I will add your domain specifically to Zoom.
The in-person location will be **Pepper Canyon Hall 109 (PCYNH 109).** I will announce over Canvas when I will begin teaching in person.

Instructor:
Matt Daugherty
Email: MDDaugherty@UCSD.edu (Please put BIMM114 in the subject line so I see your email)
Office hours: Thursday 4:00pm-5:00pm.
Location: Natural Sciences Building, room TBD.
For at least the first two weeks, I will hold office hours over Zoom. The link is available on Canvas.

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.

Your digital course materials are provided by the UC San Diego Bookstore through Canvas and are free for the first two weeks of classes. After two weeks, your student account will be charged a special reduced price unless you opt out. If you decide to opt out you must complete the process by **January 15th, 2022** and you will be responsible for sourcing the materials elsewhere.
For any questions about billing please contact textbooks@ucsd.edu.
For any questions about using your eBook please reference RedShelf Solve.

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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 to the class website either before class or immediately afterwards. 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. All lectures will be recorded and posted to the course website as soon after the lecture as they become available. You will be responsible for information provided in lecture in addition to the material assigned in the text.

Synchronous and asynchronous components:
Most lectures will be synchronous in person (when possible) and on Zoom during the designated class time period and all lectures will be recorded and available for asynchronous viewing following the scheduled lecture time. Synchronous lecture attendance is not mandatory but highly encouraged as there will be opportunities for discussion of material or questions. Zoom details are on Canvas. Remember that **you need to be signed in through your UCSD account to join the Zoom sessions**. Also remember that **all lectures will be recorded.**

Discussion sections will be synchronous in person and/or over Zoom during the designated time period. Discussion section attendance is not mandatory, but highly encouraged.

Three quizzes will be given on Canvas asynchronously at the end of week 2 (1/14), week 5 (2/4), and week 9 (3/4). Quizzes will be posted Friday evening and are due by Sunday at 11:59pm. A missed quiz will result in a zero.

Two midterm exams will be given on Canvas synchronously during the class lecture time period. The final exam will be given synchronously on Canvas as designated in the schedule of classes. A missed exam for which there is no documented extenuating circumstance will result in a zero.

Office Hours will be in person and/or over Zoom synchronously. Zoom links will be on the class calendar in Canvas.

Questions during lecture:
Opportunities will be given midway and at the end of each lecture to ask questions. When lectures are in person, I will prioritize questions from students in the classroom. For Zoom, please use the "raise your hand" feature in zoom and I will call on you. I will also unlock the chat during these times for people that would prefer to type a question. If I cannot answer the question in that time, the IAs will attempt to answer your question in the order the question appears in the chat.

Office hours with Dr. Daugherty:
Thursday 4:00pm-5:00pm. The first two weeks will be over zoom. Depending on campus re-opening, I will begin holding office hours in person. 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.

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

IA	Email	Office hours	Location
Lennice Castro	lkcastro@ucsd.edu	Monday 10 - 11am	NSB 2nd floor patio
Katelyn Nguyen	ktn002@ucsd.edu	Monday 3 - 4pm	NSB, 5th floor 'kitchen'
Brian Dinh	btdinh@ucsd.edu	Tuesday 4 - 5pm	Middle of Muir (MOM) Café
Miles Corley	mcorley@ucsd.edu	Wednesday 11am - 12pm	Mandeville coffee cart
Caesar De-la-fuente	cdelafue@ucsd.edu	Thursday 12 - 1pm	Muir Biology, Room 2230

Office hours for at least the first two weeks will be over Zoom. If and when campus re-opens, office hours will be held in the location listed above.

Discussion sections:
Discussion sections are a valuable part of this course and serve to clarify, emphasize and expand points that have been introduced in lecture. The IAs will craft each meeting to include opportunities for review, discussion, and expansion on particularly timely topics. There will be **no sections the first week of class**. Please attend the section you are assigned to so that the class sizes are manageable for the IAs. All sections will be held in person in TM102 and/or on Zoom. Zoom links will be on the class calendar in Canvas.

Section	Day	Time	Room	IA
A01	Mon	2:00 - 2:50pm	TM102	Lennice
A02	Mon	3:00 - 3:50pm	TM102	Lennice
A03	Mon	4:00 - 4:50pm	TM102	Brian
A04	Fri	8:00 - 8:50am	TM102	Miles
A05	Fri	9:00 - 9:50am	TM102	Katelyn
A06	Fri	10:00 - 10:50am	TM102	Caesar

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 will hold the following review sessions before exams. I will not prepare anything special for these, they are simply an opportunity for you to ask any remaining questions you have before the exam that you have not had answered in discussion section or office hours:

1st midterm review: Friday January 21, 3 – 4pm. Zoom link will be on Canvas
2nd midterm review: Wednesday February 16, 3 – 4pm. Location/Zoom TBD
Final exam review: Tuesday March 15, 2 – 3:30pm. Location/Zoom TBD

Quizzes, exams and grading:
Your performance in the course will be evaluated by three quizzes, two in-class midterm exams and the final exam. Regardless of whether lectures are in-person or over Zoom, all quizzes and exams will be given over Canvas to make sure everyone has the same opportunity to do well. Quizzes and exams will consist of fill in the blank, short answer, multiple choice, and short essay questions.

Quizzes and exams will be open book and open note. However, you may not consult other students or the internet (outside of your online textbook or material on the course website). It is important to remember that open book and open note exams still require that you study. The questions will be harder than what would be found on a closed-book exam and the exam will still need to be completed in the same amount of time. If you plan to look up every answer, you will run out of time so please make sure you study for the exam.

There are no scheduled make-up quizzes or exams. Failure to take the quiz/exam will result in a zero. Extraordinary circumstances preventing you from taking an exam must be discussed >24 hours in advance with the Student Affairs Office (vcsa@ucsd.edu) 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.

Quizzes: Quizzes will be given at the end of weeks 2, 5, and 9. Quizzes will be posted on Canvas by Friday evening and need to be completed by Sunday at 11:59pm. You will have 30 min to complete the quiz once you begin it. Each quiz will be worth 3% of your grade. Everyone who completes all three quizzes will have 1% automatically added to their grade.

Midterm I: Given during class time on January 25. Worth 25% of your grade. Will cover all lecture and reading material assigned for lectures 1-6.

Midterm II: Given during class time on February 17. Worth 25% of your grade. Will predominantly cover lecture and reading material assigned for lectures 8-13, but materials from lectures 1-6 will need to be remembered for this exam.

Final: Given on **March 17 3:00pm – 6:00pm**. Worth 40% of your grade. Covering all lecture and reading material assigned the entire class with emphasis on material and reading assigned for lectures 15-20.

Extra credit: You will be able to earn up to 3% extra credit on your final grade by completing either of the extra credit assignments described below before the last day of class. Extra credit will be assigned as determined by Dr. Daugherty.

Option #1: Viruses In The News! To encourage you to apply your newfound virology knowledge to things you read/hear in the news, please identify an article from a credible popular news source about emerging viruses other than SARS-CoV-2 and email 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 2021 or 2022. Please do not use primary scientific literature (see below) as I want stories that have been published in the popular press. 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 on Twitter.

Option #2: This Article Is Not Yet Peer-Reviewed! An exciting trend in science right now is the rise of "pre-print" servers in which articles are released to the public but have not yet been peer-reviewed. This can be a fantastic way to get results out quickly (which has been essential for the COVID-19 pandemic), but also results in results being released that may not be completely scientifically sound (which has been a problem during the COVID-19 pandemic). To encourage you to apply your newfound virology knowledge to the scientific literature, please identify an unpublished virology article from a pre-print server (either bioRxiv.org or medRxiv.org) and email me a brief (2-3 pages or 1000-2000 words) critique of the article, focusing on its importance, strengths and weaknesses. 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 – This Article Is Not Yet Peer-Reviewed' in the subject line of the email. The article should be from sometime in 2021 or 2022 and should not be published in a peer-reviewed journal.

Grading policy:
For each exam, grading is normalized to the highest score in the class. No quizzes or exams will be 'dropped', so every one of them will count toward your final grade. For final grades, 60-70% will be a D, 70-80% will be a C, 80-90% will be a B and 90-100% will be an A. You are not competing with your fellow students … it is you against the material. 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. 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:
To submit a request for a regrade, you must:

1. Write an email 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. The regrade request must be delivered within one 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.

Academic integrity:
Work on quizzes and exams must be solely your own. You may consult your textbook and your class notes but no other sources and you may not discuss with any other student. 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! We will be employing real-time exam monitoring as well as cheat-detection algorithms to confirm that everyone is doing this fairly.

Please review UCSD's Policy on Academic Integrity:
https://senate.ucsd.edu/Operating-Procedures/Senate-Manual/Appendices/2

Additional student resources and policies on discrimination and harassment:
Please see document titled "Student Resources for BIMM 114" in "Syllabus" folder on Canvas.

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How can I succeed in BIMM 114?

1. **Read** the assigned pages before lecture. You will understand the lectures better. 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 participate in discussion.
4. **Rewatch** lectures.
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 and ask questions.
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.
9. **Take quizzes seriously**. Though short, these will give you a sense for the types of questions that will be on exams.
10. **Prepare for exams.** Exams will be open book and open note but you will not have time to go and look for each answer. Make sure you study the materials so that you have enough time to finish the exam.

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Class schedule:

Date	Class	Topic	Relevant reading
Jan 4	1	Introduction, history & methods	pg. 2-11, 312-313
Jan 6	2	Structure and classification	pg. 11-40
Jan 11	3	Replication cycle	pg. 11-17 and Chapter 4
Jan 13	4	Replication cycle/Host defense	Chapters 4 & 33
Jan 18	5	Host defense	Chapter 34
Jan 20	6	Evolution and emerging viruses	pg. 40-44, outside reading*
Jan 25	7	**Midterm I, in class**	
Jan 27	8	+ssRNA: *Picornaviridae*	Chapter 11
Feb 1	9	+ssRNA: *Flavi-* and *Togaviridae*	Chapters 12 & 13
Feb 3	10	+ssRNA: *Coronaviridae* and SARS-CoV-2	Chapter 14
Feb 8	11	-ssRNA: *Paramyxo- and Filoviridae*	Chapters 15 & 16
Feb 10	12	-ssRNA: *Orthomyxoviridae*	Chapter 18
Feb 15	13	-ssRNA and dsRNA: *Bunya-* and *Reoviridae*	Chapters 17 & 19
Feb 17	14	**Midterm II, in class**	
Feb 22	15	dsDNA: *Polyoma-, Papilloma-* and *Adenoviridae*	Chapters 21, 22 & 23
Feb 24	16	Large dsDNA: *Herpes* - and *poxviridae*	Chapters 24 & 26
Mar 1	17	RT utilizing: *Hepadna-* and *retroviridae*	Chapters 30 & 28
Mar 3	18	*Retroviridae* and HIV	Chapters 28 & 29
Mar 8	19	Vaccinies/antiviral drugs	Chapters 35 & 36
Mar 10	20	Extra topics or class review	
Mar 17		**Final Exam, 3pm - 6pm**	

* - 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.

Note that lecture material may be presented outside of the days described above.