

General Virology MICR 4351 – CRN 13252 Fall 2017
INSTRUCTOR: Dr. Kyle L. Johnson, Department of Biological Sciences
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OFFICE HOURS: MW, 1:00 p.m. – 2:00 p.m.
LECTURE: MW, 3:00-4:20 p.m., CRBL C305
TEXTBOOK: Podcasts from This Week in Virology (<http://www.microbe.tv/twiv>)
and papers from the primary literature will be used in place of a textbook

COURSE OBJECTIVES

This course provides an integrated approach to studying molecular virology and the pathogenesis of animal viruses. Our objectives are:

1. To understand the molecular mechanisms of cell attachment and entry, viral genome replication, transcription, translation, and assembly of virus particles, including the virus-host interactions involved in these processes, and the basic mechanisms of viral pathogenesis
2. To develop familiarity with and understanding of standard methods and procedures used in virology research
3. To develop key scientific writing skills to facilitate communication with colleagues in academic and professional settings
4. To build a foundation of basic scientific principles in order to interpret the key issues facing the fields of virology and public health

COURSE GOALS

1. Learn the fundamental concepts of molecular virology
2. Learn to critically evaluate papers from the current virology literature
3. Apply the concepts you've learned
4. Extrapolate information and facts from what you already know
5. Communicate your understanding of virology both orally and in writing

COURSE APPROACH

Each 90-minute class session will combine my lectures with cooperative learning activities. These activities are designed to give you the opportunity to participate in the learning process. In the first class session we will form groups of 5 students based on functional roles that you will help define. You will remain a member of your group for the duration of the semester. We will use the groups for class discussions, group-learning exercises, and problem-solving assignments. The in-class activities will give each of you the opportunity to discuss issues that are posed to the class and may include course material from your textbook or new material not presented to you beforehand.

BLACKBOARD. I will post all course materials on Blackboard. It is your responsibility to download anything required for the class session and to bring it with you to class. I strongly recommend that you visit the course Blackboard site before each class. RATs will be given on Blackboard.

THIS WEEK IN VIROLOGY (TWiV). This Week in Virology is a podcast about viruses presented by several noted science professors, mostly virologists, from universities

across the U.S. The goal of these innovative programs is to have informal conversations about viruses that are accessible to anyone, regardless of their backgrounds. We will use TWiV in place of a textbook this semester. You can access TWiV at <http://www.microbe.tv/twiv> - download the episodes or subscribe to TWiV on iTunes, RSS feed, or by email.

RESPONDUS LOCKDOWN BROWSER. The Respondus Lockdown Browser is designed to prevent the use of external online sources during an exam. This helps the student focus on the exam without any external distractions. Students will be required to download Respondus Lockdown Browser prior to the exam, update both your computer software and the Respondus Lockdown Browser, and participate in a practice exam BEFORE the Data Interpretation Exam. On the date of the exam, the student should:

1. Bring a laptop to the classroom.
2. Sign in to the UTEP Secure Wi-Fi network.
3. Start the Respondus Lockdown Browser.
4. Log in to your UTEP Blackboard Account.
5. Access the exam at the announced time.

THE UNIVERSITY WRITING CENTER (<http://academics.utep.edu/writingcenter>). The UWC is located in room 227 of the Library. They offer writing assistance to all students, free of charge. The Center's services include help with analyzing your audience; understanding different types of writing (e.g., response papers, research reports, summaries, and arguments); brainstorming ideas and organizing your thoughts; finding the right words to express yourselves; deciding on the best way to revise your drafts; learning how to correct grammatical errors; and properly documenting your sources (this information comes from the UWC website).

CLASS POLICIES

MISSED EXAMS. If you know ahead of time that you will not be able to take an exam on the scheduled date, notify me as soon as possible and I will allow you to take the exam early, with no penalty. If you miss an exam and you can provide PROOF for your reasonable absence, the exam will be rescheduled at my convenience but must be taken before the graded exam is distributed to the class. If you miss the exam, and you cannot provide proof for your absence, you will NOT be allowed to make it up.

LATE HOMEWORK. Homework packets are due at the beginning of class ONLY on the due date (see schedule) WITH NO EXCEPTIONS. LATE homework will NOT be accepted. Drafts and final copies of homework assignments must be typewritten in a legible font and will be accepted ONLY in class (NEVER by e-mail). Failure to turn an assignment in on time will result in an automatic zero.

HONORS AND GRADUATE CREDIT. Please see me by September 11 if you wish to take this course for honors credit. In addition to the class requirements outlined below, I will assign a research paper on a topic relevant to current virology. An outline of your paper must be approved by November 16, and the paper is due no later than November 30.

COURTESY. As a courtesy to your classmates, please give your full attention to all speakers and limit your in-class discussions to topics related to virology. Cell-phones and pagers must be turned off or set to silent mode for the duration of the class sessions. Tablet, laptop, and notebook computers are permitted ONLY if used for class-related activities – they must be turned OFF during exams. Please be on time for class – it disturbs the class when you arrive late.

ACADEMIC DISHONESTY. It is the official policy of the University of Texas at El Paso that academic dishonesty is a completely unacceptable mode of conduct and will not be tolerated in any form. Scholastic dishonesty includes, but is not limited to cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts. All persons involved in academic dishonesty will be disciplined in accordance with University regulations and procedures. Please see the Office of Student Conduct and Conflict Resolution (OSCCR) website at <http://sa.utep.edu/osccr/> for details.

DISABILITIES. If you have a disability and need classroom accommodations, please contact The Center for Accommodations and Support Services (CASS) at 747-5148, by email to cass@utep.edu, or go to Union Building East, Room 106. For additional information, please visit the CASS website at <http://www.utep.edu/CASS>. *CASS' Staff are the only individuals who can validate and if need be, authorize accommodations for students with disabilities.*

Absence and Drop Policy: It is your responsibility to attend class regularly. If you have a serious illness or a legitimate excuse (includes military personnel called to active duty or training) for being out of town, make arrangements with me before you leave. To receive an automatic “W”, students must drop or withdraw from this class by the **October 28** drop date, as indicated in the academic schedule.

GRADING SYSTEM

Your grade will be based on a comprehensive assessment of your skills and their development throughout the course of the semester, using the following criteria.

1. Quizzes. These will be given on Blackboard and are designed to test your knowledge of the material presented each day's TWiV assignments. The quizzes will ensure that you are keeping up with the class. A total of 25 quizzes will be given, but only the 20 highest scores will count toward your final grade. Each RAT is worth 5 points. Each RAT must be completed TWO HOURS before each day's class, that is by 8:00 am on class days. You will have two hours in which to take each RAT and will have access to it only once. The RATs that are due on Mondays will be available at 5 pm the previous Friday and those that are due on Wednesdays will be available at or before 5 pm on Monday. You may use your class notes and textbooks during each RAT.

2. Homework. Two individual homework assignments will be given. The homework is designed to promote critical thinking and written communication skills. Essential elements of each homework assignment include preparation of a written, nearly final draft, participation in the corresponding UWC workshop, and editing your draft to include the reviewers' comments, which also must be turned in on the due date.

Assignments will be posted on Blackboard and your completed assignment will be uploaded directly to Blackboard on the due date. Homework must be typewritten in a legible font. It will be graded for spelling, grammar, and content. Homework will be accepted ONLY on the due date, WITH NO EXCEPTIONS. LATE homework will NOT be accepted and failure to turn in an on-time assignment will result in a score of zero.

3. In-class Exercises. You will be divided into small groups of four members each. These are problem-based learning sessions, which will take place in your small groups. They focus on your ability to integrate basic science to the solution of research or clinical problems and will encourage you to work together, to develop critical thinking, to improve communication skills, and to get to know one another better. These exercises are open-book: bring any notes or texts you might find helpful.

4. Final Paper. Each GROUP will collaborate to prepare a 4-page final paper worth 200 points. The paper will involve synthesis of the materials that each group member develops during the course of the homework assignments. It is due IN CLASS on November 24.

5. Exams. A total of four exams will be given during the semester, each worth 100 points. This includes a comprehensive final exam during finals week. However, only the THREE highest exam scores will count toward your final grade and the fourth score will be discarded. The exams will test your understanding of all of the materials covered in the textbook, in class, and on homework assignments, and your ability to APPLY the concepts you have learned. Expect that up to 25% of each exam could include material from the previous exam. Exams may combine multiple-choice and short-answer questions.

In summary,

| | | |
|--------------------|--|----------------|
| Quizzes | 200 points (20 quizzes/10 pts each) | |
| Homework | 100 points (2 assignments/50 pts each) | = 20% of total |
| In-class exercises | 100 points | |
| Final Paper | 200 points | = 20% |
| Exams | 300 points (3 exams/100 pts each) | = 30% |
| <hr/> | <hr/> | |
| Total | 1000 points | |

where, A = 900 – 1000
 B = 800 - 899
 C = 700 – 799
 D = 600 – 699
 F = 599 and below

Grading is NOT based on a curve. You will each EARN a grade that reflects the effort you put into the course and the knowledge you have gained.

Please note that the exact date on which we will discuss each topic is subject to change, depending on the pace of the course.

| # | Date | TOPIC(S) | References |
|----|------------|--|--------------|
| 1 | Aug. 28 | Introduction | |
| 2 | Aug. 30 | | |
| -- | Sept. 4 | Labor Day - no classes | |
| 3 | Sept. 6 | Genomes and genetics | TWiV 49; |
| 4 | Sept. 11 | Virus structure | TWiV 39; (1) |
| 5 | Sept. 13 | Attachment and entry | TWiV 46; (2) |
| 6 | Sept. 18 | | TWiV 166 |
| 7 | Sept. 20 | Synthesis of RNA from RNA templates (RNA replication) | TWiV 60; |
| 8 | Sept. 25 | | |
| 9 | Sept. 27 | Reverse transcription and integration | TWiV 66; |
| 10 | Oct. 2 | | |
| 11 | Oct. 4 | EXAM 1 | |
| 12 | Oct. 9 | Synthesis of RNA from DNA templates (transcription) | TWiV 162; |
| 13 | Oct. 11 | | |
| 14 | Oct. 16 | Replication of DNA genomes | TWiV 96; |
| 15 | Oct. 18 | | TWiV 106; |
| 16 | Oct. 23 | Processing of viral pre-mRNA | |
| 17 | Oct. 25 | | |
| 18 | Oct. 30 | Protein synthesis | |
| 19 | Nov. 1 | | |
| 20 | Nov. 6 | EXAM 2 | |
| 21 | Nov. 8 | Intracellular trafficking | |
| 22 | Nov. 13 | | |
| 23 | Nov. 15 | UWC Workshop 3 (Paper draft due) | |
| 24 | Nov. 20 | Assembly, exit, and maturation | |
| 25 | Nov. 22 | | |
| -- | Nov. 23-24 | Thanksgiving Break – no classes | |
| 26 | Nov. 27 | The infected cell | |
| 27 | Nov. 29 | | |
| 28 | Dec. 4 | Current Topics in Virology | |
| 29 | Dec. 6 | EXAM 3 | |
| 30 | Dec. 11 | FINAL EXAM, 1:00 – 3:45 p.m. | |

DUE DATES FOR HOMEWORK, QUIZZES, AND EXAMS

| Session | Date | Assignment Due |
|---------|------------|--|
| 1 | Aug. 28 | |
| 2 | Aug. 30 | Quiz 1 |
| -- | Sept. 4 | Labor Day - no classes |
| 3 | Sept. 6 | Quiz 2 |
| 4 | Sept. 11 | Quiz 3 |
| 5 | Sept. 13 | Quiz 4 |
| 6 | Sept. 18 | Quiz 5 |
| 7 | Sept. 20 | Quiz 6 |
| 8 | Sept. 25 | Quiz 7; |
| 9 | Sept. 27 | Quiz 8 |
| 10 | Oct. 2 | |
| 11 | Oct. 4 | Quiz 9 |
| 12 | Oct. 9 | Quiz 10 |
| 13 | Oct. 11 | Quiz 11 |
| 14 | Oct. 16 | Quiz 12 HW 1 paper due; EXAM 1 |
| 15 | Oct. 18 | Quiz 13 |
| 16 | Oct. 23 | Quiz 14 |
| 17 | Oct. 25 | Quiz 15 |
| 18 | Oct. 30 | |
| 19 | Nov. 1 | Quiz 16; Writing Workshop in class; HW2 draft due |
| 20 | Nov. 6 | Quiz 17; EXAM 2 |
| 21 | Nov. 8 | Quiz 18; Homework 2 due |
| 22 | Nov. 13 | Quiz 19 |
| 23 | Nov. 15 | Quiz 20 |
| 24 | Nov. 20 | Quiz 21 |
| 25 | Nov. 22 | Quiz 22 |
| -- | Nov. 23-24 | Thanksgiving Break – no classes |
| 26 | Nov. 27 | Quiz 23 |
| 27 | Nov. 29 | Quiz 24 |
| 28 | Dec. 4 | Quiz 25; Final paper due in class |
| 29 | Dec. 6 | EXAM 3 |
| 30 | Dec. 11 | FINAL EXAM |

Reading List

1. **Prasad BV, Schmid MF.** 2012. Principles of virus structural organization. *Adv Exp Med Biol* **726**:17-47.
2. **Gardner MR, Kattenhorn LM, Kondur HR, von Schaewen M, Dorfman T, Chiang JJ, Haworth KG, Decker JM, Alpert MD, Bailey CC, Neale ES, Jr., Fellingner CH, Joshi VR, Fuchs SP, Martinez-Navio JM, Quinlan BD, Yao AY, Mouquet H, Gorman J, Zhang B, Poignard P, Nussenzweig MC, Burton DR, Kwong PD, Piatak M, Jr., Lifson JD, Gao G, Desrosiers RC, Evans DT, Hahn BH, Ploss A, Cannon PM, Seaman MS, Farzan M.** 2015. AAV-expressed eCD4-Ig provides durable protection from multiple SHIV challenges. *Nature* **519**:87-91.