

MICR 4100 01 30526

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GENERAL VIROLOGY

Tentative course schedule (subject to change)

MWF 8:00 AM - 8:50 AM, FA218

Office: BIOS 262;

WM, 9:00 -11:00 AM; OR by appointment

Date	Lecture	Chapter & Questions
Jan. 23 M	Lec. 1 - Introduction; Lecture Course Syllabus	
25 W	Lec. 2 - Introduction to viruses	
27 F	Lec. 3 - <i>cont.</i> Introduction to viruses	
30 M	Lec. 4 - Historical background	1, 2
Feb. 1 W	Lec. 5 - History (<i>Knowledge</i>);	1, 2
3 F	Lec. 6 - Virus and Host Infection	1, 2 (13)
6 M	Lec. 7 - <i>cont.</i> Virus and Host Infection, Viral Diseases;	3, 4
Feb. 8 W	Lec. 8 - Patterns of Human Virus Disease	3, 4
10 F	Lec. 9 - Virus Structure and Classification	5
Feb. 13 M	Lec. 10 - Virus Replication Cycle	6
15 W	Lec. 11 - Host Defense Mechanisms: Vaccine	8
17 F	Lec. 12 - <i>cont.</i> Host Defense :Interferon, Antiviral Drugs	8
20 M	Lec. 13 - Positive-sense RNA Viruses: <i>Picornavirus, Flavivirus</i>	14
Feb. 22 W	Lec. 14 - <i>cont.</i> Positive-sense RNA Viruses: <i>Flavivirus</i>	14
24 F	Lec. 15 - Positive-sense RNA Viruses: <i>Togavirus,</i>	14
Feb. 27 M	Lec. 16 - Positive-sense RNA Viruses: <i>Togavirus, Coronavirus</i>	14
March 1 W	Lec. 17 - Review session for the first midterm	
3 F	Lec. 18 - First Midterm Exam	
6 M	Lec. 19 - Negative-sense RNA Viruses (Monopartite): <i>Rhabdovirus,</i>	15
March 8 W	Lec. 20 - <i>Paramyxovirus, Filovirus, Bornavirus</i>	15
10 F	Lec. 21 - Negative-sense RNA Viruses (Multiparite): <i>Orthomyxovirus</i>	15
13 M	Lec. 22 - Multipartite: <i>Orthomyxovirus</i>	15
March 15 W	Lec. 23 - Ambi-sense RNA Viruses: <i>Bunyavirus, Phlebovirus, Arenavirus</i>	15
17 F	Lec. 24 - <i>cont.</i> Ambi-sense RNA Viruses: <i>Bunyavirus, Phlebovirus, Arenavirus</i>	15
20 M	Lec. 25 - Double-stranded RNA Viruses: <i>Reovirus;</i>	15
March 22 W	Lec. 26 - Subviral Pathogens: <i>Hepatitis Delta Virus, Viroid, Prion ; Life on the Edge</i>	15
24 F	Lec. 27 - Review session for the second midterm	
27 M	No Lecture - Spring Break	
March 29 W	No Lecture - Spring Break	
31 F	No Lecture - Spring Break	
3 M	Lec. 28 - Second Midterm Exam	
April 5 W	Lec. 29 - Medium-Sized DNA Viruses: <i>Adenovius</i>	16
7 F	Lec. 30 - Single-Stranded DNA Viruses : <i>Parvovirus</i>	16
10 M	Lec. 31 - Small-Sized DNA Viruses: <i>Papovavirus;</i>	16
April 12 W	Lec. 32 - <i>cont.</i> Small-Sized DNA Viruses: <i>Papovavirus;</i>	16
14 F	Lec. 33 - Introduction to large DNA viruses	
17 M	Lec. 34 - Large-sized DNA viruses : <i>Herpesvirus</i>	16
April 19 W	Lec. 35 - Cytoplasmic DNA Viruses: <i>Poxirus</i>	18
21 F	Lec. 36 - Reverse Transcribing Viruses: <i>Retrovirus;</i>	19
24 M	Lec. 37 - Reverse Transcribing Viruses: <i>Hepadnavirus;</i>	21
May 26 W	Lec. 38 - The Future (Imagination)	25
28 F	Lec. 39 - Control of Viral infection, Serological tests	

	1 M	Lec. 40 - Student Group Presentations (case studies #1 through #3)
May	3 W	Lec. 41 - Student Group Presentations (case studies #4 through #6)
	5 F	Lec. 42 - Student Group Presentations (case studies #7 through #9)
	8 M	Lec. 43 - Student Group Presentations (case studies #10 through #12)
May	10 W	Lec. 44 - Student Group Presentations (case studies #13 through #15)
	12 F	Lec. 45 – Review session
May	19 F	Third (Final) Exam, Friday, 7:00am -9:00am

Reading Chapter & Questions in *Basic Virology, Third Edition (2008)* by Edward K. Wagner, Martinez J. Hewlett, David C. Bloom, and David Camerini (Blackwell Publishing).

Class materials available on: **Moodle.calstatela.edu**

Course Prerequisite – Courses to be taken prior to this class:

MICR 3300 (Microbial Genetics) **OR** BIOL 340 (Gen. Genetics) & MICR 300A (Gen. Micro).

The knowledge of nucleic acid and biosynthesis is necessary for an understanding of virus biology and replication. You must be familiar with the structure and synthesis of DNA, RNA and proteins. Any recent biochemistry or cell biology textbook, including Chapter 13 (Viruses Use Cellular Processes to Express their Genetic Information) in *Basic Virology*, may be used to review.

Course Objectives – To learn and understand:

1. Virus biology and replication
2. Virus disease, transmission, prevention and treatment
3. Host cell response to viral infection
4. Role of viruses in biology
5. Creative Problem Solving (Knowledge)
6. Critical thinking Skills (Truth)

This course is on the biology and replication of viruses. We will compare major groups of animal viruses and their differing strategies for replication. We will examine viral diseases and their epidemiology. The goal of education is to develop an ability to learn and think independently to arrive at truth.

Text – REQUIRED: *Basic Virology, Third Edition* by EK Wagner, MJ Hewlett, DC Bloom, and D Camerini (2008) will be the text for the class. It is an introductory text that covers the biology, replication strategy, and disease process of viruses. It is supported by website: www.blackwellpublishing.com/wagner.

REFERENCE: *Medical Microbiology*, by P. R. Murray et al. is for the Case Study reports.

Both books are available on 2 hour Reserve Loan in the Kennedy Memorial Library

Additional useful internet websites are listed in *Basic Virology* Appendix.

Evaluation of Student Learning

I. Written Examination – Three interval (one hour) examinations will be given. Tentative dates for the first two examinations are given in the course schedule. Exact dates will be announced in advance. The Final Examination is Friday, May 19. Each examination will be 100 points and cover lecture material, assigned text chapter reading + questions, and Case Study reports. Format of the examinations will be objective (multiple choice, true-false, identification) and short essay (similar to text chapter questions). They will challenge you to synthesize the knowledge you learned and to arrive at new concepts.

Make-Up Examination – A comprehensive make-up examination will be given to anyone missing any one of the first two examinations **due to a serious reason**. If you are unable to take an examination, please notify the instructor before if possible or as soon as possible. The instructor must be contacted within one week of the scheduled examination in order to take the make-up examination. The make-up examination will be about one week after the scheduled examination. The relevant telephone and e-mail address are on the first page to notify the instructor.

2. **Case Study Group** - Each student will be put into a group and given a patient medical case history along with relevant questions (taken from *Medical Microbiology*). This will be to learn and understand the viral diseases. The student group will give a 15 minutes Case Study presentation to the class and write a report (5-6 pages) on the accompanying questions. Evaluation will be based on the quality of the oral presentation and of the written report (content = 30 pts., communication = 20 pts.; 50 pts. each for oral and written report = 100 pts.). More information will be given later.

Grade Assignment – A total of 400 points is possible. Grades in the course will be based on having earned the following points:

400 – 360 (100-90%)	A	EXAMINATIONS	=	300
359 – 320 (89-80%)	B			
319 – 280 (79-70%)	C	CASE STUDY	=	100
279 – 240 (69-60%)	D		_____	
below 240 (<60%)	F	TOTAL		400

COURSE POLICIES

Attendance: Lecture attendance is left to the prerogative of the student, with the understanding that all information presented is the student's responsibility. Failure to come to class, however, will result in fewer participation points for the in class questions and case studies and that will have a negative impact on your grade. Please allow **48 hours** to receive responses to email inquiries.

Assignments and Exams: A “0” will be assigned for any missed exams, homework assignments, etc. unless the absence is satisfactorily justified (e.g. doctor’s note). There will be no make-up assignments or exams. **Assignments turned in late will not be accepted!**

Drop Policy: The Drop/Incomplete policy explained in the University General Catalogue will be strictly followed.

Academic Honesty: Students are expected to read and abide by the University's Academic Honesty Policy, which can be found at <http://www.calstatela.edu/academic/senate/handbook/ch5a.htm> and www.calstatela.edu/JudicialAffairs. Students who violate this policy will be subject to disciplinary action, and may receive a failing grade in the course for a single violation.

ADA Statement: Reasonable accommodation will be provided to any student who is registered with the Office of Students with Disabilities and requests needed accommodation. Make sure the Office staff contact me directly at jazirehi@gmail.com

Extra Credit: Participation in class discussion is strongly encouraged; extra credit (up to 30 points) will be given to participating students.

GETZELS/HELMHOLTZ/POINCARÉ STEPS TO CREATIVE PROBLEM SOLVING

1. First Insight:

Ask a question.
Entry level questions. I wonder why? I wonder if?
Inquiry methods used to initiate insight and understanding of concepts.

2. Saturation:

Research and inquiry into existing information.
One is focused on research methods and finds everything that they can that is relevant.
At this time one may find things they do not expect.

3. Incubation:

This stage can vary in terms of time and the quality of the research and questions asked in the prior stage.
Requires wait time and redundant activities.
Good time to take a shower, and do dishes!

4. “Ah-Ha” moment of creativity:

The moment of insight.
The quality of the insight depends on the quality of the questions, the nature of the research, etc.

A state that is fragile, all at once, Eureka! I have found it!
Joy/relief are experienced.

5. Verification:

The stage of putting the solution into concrete form while checking it for error and usefulness.

Where one's investment in the process pays off. Scrutiny and testing are used to prove something.

A must in the scientific community.

Thus we have an approximate structure of five stages in the creative process.

Background information on this creativity model:

Successive steps in the creative process, were not categorized until late in the nineteenth century, when the German physiologist and physicist Herman Helmholtz described his own scientific discoveries in terms of three specific stages. He named the first stage of research *saturation*; the second, mulling-over stage *incubation*; and the third stage, the sudden solution, *illumination*. French mathematician Henri Poincare added a fourth stage, *verification*.

In the early 1960's, the American psychologist Jacob Getzels contributed the important ideal of a stage that precedes Helmholtz's saturation: a preliminary stage of problem finding or formulating. Getzels pointed out that creativity is not just solving problems of the kind that already exist or that continually arise in human life. Creative individuals often actively search out and discover problems to solve that no one else has perceived. Another American psychologist, George Kneller, named Getzels' preliminary stage *first insight* – a term that encompassed both problem solving (of existing problems) and problem finding (asking new and searching questions).

B. Edwards *Drawing on the Artist Within: An Inspirational and Practical Guide to Increasing Your Creative Powers, 1986.*

“The formulation of a problem is often more essential than its solution, which may be merely a matter of mathematical or experimental skill. To raise new questions, new possibilities, to regard old questions from a new angle, requires creative imagination and marks real advances in science.”

A. Einstein and L. Infeld *The Evolution of Physics, 1938.*

A TAXONOMY OF CRITICAL THINKING SKILLS

“Many people would sooner die than think. In fact they do.”

Bertrand Russell (quoted in *Macmillan Publishers, 1989*)

1. Verbal Reasoning Skills

The skills listed under this rubric include those that are needed to comprehend and defend against the persuasive techniques that are embedded in everyday language (also known as natural language). Thinking and language are closely constructs, and the skills included in this section recognize the reciprocal relationship between language and thought in which an individual's thoughts determine the language used to express them, and the language that is used shapes the thoughts.

2. Argument Analysis Skills

An argument is a set of statements with at least one conclusion and one reason that supports the conclusion. In real life settings, arguments are complex with reasons that run counter to the conclusion, stated and unstated assumptions, irrelevant information, and intermediate steps.

Arguments are found in commercials, political speeches, textbooks, and anywhere else where reasons are presented in an attempt to get the reader or listener to believe that the conclusion is true. The skills of identifying conclusions, rating the quality of reasons, and determining the overall strength of an argument should be sharpened in college course work.

3. Skills in Thinking as Hypothesis Testing

The rationale for this category is that much of our day-to-day thinking is like the scientific method of hypothesis testing. In many of our everyday interactions, people function like intuitive scientists in order to explain, predict, and control the events in their life. The skills used in thinking as hypothesis testing are the same ones that are used in scientific reasoning – the accumulation of observations, formulation of beliefs or hypotheses, and then using the information collected to decide if it confirms or disconfirms the hypotheses.

4. Using Likelihood and Uncertainty

Because very few events in life can be known with certainty, the correct use of probability and likelihood plays a critical role in almost every decision. Huff's (1954) tiny, popular book *How to Lie With Statistics* is still widely quoted because it explains how easy it is to mislead someone who does not understand basic concepts in probability. The critical thinking skills that are subsumed under this heading are an important dimension of a college-level critical thinking taxonomy.

5. Decision Making and Problem Solving Skills

In some sense, all of the critical thinking skills are used to make decisions and solve problems, but the ones that are included here involve the generation and selection of alternatives and judging among them. Many of these skills are especially useful in quantitative reasoning problems.

Taken together these five categories define an organizational rubric for a skills approach in critical thinking. They have face validity and can be easily communicated to the general public and students and offer one possible answer to the question of what college students need to know and be able to do to compete and cooperate in the world's marketplace and function as effective citizens in a democratic society.

D. F. Halpern *Thought and Knowledge: An Introduction to Critical Thinking, 2002.*