

MICRO 301, GENERAL MEDICAL MICROBIOLOGY, FALL 2011

Moon Lee, Ph.D. Harbor-UCLA Medical Center
(310)222-1846, mlee@LABioMed.org

Office: BIOS 120, x3-2084
TR, 7:45 – 8:45am; 12:25-1:25 pm

LECTURE SCHEDULE

<u>Date</u>	<u>Topic</u>	<u>Reading</u>
September 22	Specimen Collection and Processing	Chp. 6
September 27	Specimen Examination and Cultivation	Chp. 6-8
September 29	Microbial Normal Flora	Chp. 2
October 4	Principles of Disease and Epidemiology Viral Case Study 1 Report due (20 points)	Chp. 2
October 6	Host Defense: Non-specific	Chp. 2
October 11	Host Defense: Non-specific Viral Case Study 2 Report due (20 points)	Chp. 2
October 13	Host Defense: Specific	Chp. 2
October 18	Host Defense: Specific Bacterial Case Study 1 Report due (20 points)	Chp. 2
October 20	Host Defense: Specific	Chp. 2
October 25	MIDTERM EXAM (100 points)	
October 27	Mechanism of Pathogenesis	Chp. 2
November 1	Mechanism of Pathogenesis	Chp. 2
November 3	Antimicrobial Agents Bacterial Case Study 2 Report due (20 points)	Chp. 12
November 8	The Microbes – Viruses	Chp. 29
November 10	The Microbes – Viruses	Chp. 29
November 15	The Microbes: Bacteria	Chp.14-26
November 17	The Microbes: Bacteria	Chp.14-26
November 22	The Microbes: Fungi Fungal Case Study 1 Report due (20 points)	Chp. 27
November 24	Thanksgiving Day Holiday	
November 29	The Microbes – Fungi	Chp. 27
December 1	The Microbes: Parasites	Chp. 28
December 6	FINAL EXAM (200 points), TUESDAY, 8:00-10:30a.m.	

Chapter **Reading** in *Textbook of Diagnostic Microbiology, Fourth Edition*, by CR Mahon, DC Lehman, G Manuselis (2011)

Additional **Case Study** reading available in *Medical Microbiology, Sixth Edition* by P. R. Murray et al. (2009) on Limited Loan in Kennedy Memorial Library

Class materials available at: <http://instructional1.calstatela.edu/mlee28>

Websites of Interest:

American Society of Virology (ASV): <http://www.asv.org/>

American Society of Microbiology (ASM): <http://www.asm.org/>

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

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

Course Prerequisite: The completion of MICR 300 (General Microbiology) with a grade of C or better.

Course Objectives: Upon completion of the course, the student will have a basic understanding of the following topics:

- 1) Normal microbial flora
- 2) Collection and cultivation of clinical specimens
- 3) Selection, use and content of microbiological culture media
- 4) Host-parasite relationships, microbial pathogenesis and host defense mechanisms
- 5) Viruses, bacteria, fungi and parasites involved in causing human disease
- 6) Antimicrobial therapy
- 7) Creative critical thinking skills

Attendance: Lecture attendance is highly recommended with the understanding that students are responsible for all information presented. Laboratory attendance is mandatory and a requirement for the Course. Case Study Reports will be turned in at lecture.

Grading: Course grades will be determined by percentage according to the following guidelines:
90-100% = A; 80-89% = B, 70-79% = C, 60-69% = D, <59% = F.

The lab and the lecture will each count for 50% of the Course Final Grade with points distributed as:

Lecture:	Midterm Exam	-	100 Points	
	Case Study Reports	-	100 Points	
	Final Exam	-	<u>200 Points</u>	
	<i>Lecture Total</i>	=	<i>400 Points</i>	(50% of Course Grade)
Lab:	Midterm Exam	-	100 Points	
	Flow charts	-	30 Points	
	Lab write-up	-	50 Points	
	Lab pop quizzes	-	70 Points	
	Final Exam	-	<u>150 Points</u>	
	<i>Lab Total</i>	=	<i>400 Points</i>	(50 % of Course Grade)

Academic Honesty: Cheating (deceit, trickery, artifice) and plagiarism (steal and pass off the ideals or words of another as one's own) are in violation of the spirit of learning at the University. A student in violation of this policy in any assignment related to this course will be subject to the options specified in the CSULA policy statement.

The Getzels / Helmholtz / Poincare 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.

GENERAL MEDICAL MICROBIOLOGY
MICROBIOLOGY 301
Fall, 2011

LABORATORY SCHEDULE

September 22	Effectiveness of Handscrubbing
September 27	Microscopes / Differential Staining / General Purpose Media
September 29	Microscopes / Special Staining / Differential and Selective Media
October 4	Skin normal flora - primary isolation
October 6	Skin normal flora – biochemicals
October 11	Skin normal flora - read biochemicals
October 13	Naso/oropharynx normal flora - primary isolation Naso/oropharynx normal flora – biochemicals Flow chart for Skin normal flora due (10 points)
October 18	Naso/oropharynx normal flora - read biochemicals
October 20	GI tract normal flora - primary isolation GI tract normal flora – biochemicals Flow chart for Naso/oropharynx normal flora due (10 points)
October 25	GI tract normal flora - read biochemicals
October 27	Sensitivity testing (Kirby Bauer and MIC) Flow chart for GI tract normal flora due (10 points)
November 1	MIDTERM EXAM (100 points)
November 3	Immunology – Precipitation (Ouchterlony); Agglutination (Mononucleosis Test, ABO & Rh typing) Sensitivity testing (MBC)
November 8	Read Ouchterlony plates; Micropipettor practice; Immunology/Virology – AIDS ELISA Lab Report for Precipitation due (10 points)
November 10	Immunology/Virology - begin AIDS Western Blot Lab Report for Agglutination due (10 points)
November 15	Immunology/Virology – finish AIDS Western Blot Transformation; Mycology isolation Lab Report for ELISA due (15 points)
November 17	Phage titer; <i>Candida</i> identification (Germ tube cryovial; CHROMagar <i>Candida</i>) Lab Report for Western Blot due (15 points)
November 22	Mycomounts of Mycology isolation
November 24	<i>Thanksgiving Day Holiday</i>
November 29	Parasitology (Protozoans, Helminths)
December 1	FINAL EXAM (150 points)

*Each student will need a bound notebook to write and record data and results for each lab exercise. However, only the Lab Report on the Immunology exercises (Precipitation, Agglutination, ELISA, Western Blot) will be written up and graded using the following outline:

- I. Background/General Information
- II. Protocol/Experimental Design
- III. Results
- IV. Conclusions

*Pop quizzes (70 total points) will be given at various times in the quarter at the beginning of class to evaluate your lab preparation and work. There will be no make-up for missed quizzes.