02/08/2016

Course Handout (Part-II)

In addition to Part I (General Handout for all courses appended to the time table) this portion gives further specific details regarding the course.

Course Number : PHA F213/ C241

Course Title : Microbiology

Instructor-in-Charge : Archana Khosa Kakkar

Co-Instructors : Deepali Gupta, Almesh Kadakol, Nisha Sharma, Shruti R, Anuradha, Pracheta Sengupta.

1.Description of the Course :

This course will provide an introduction to the study of microorganisms, their classification, structure and physiology, genetics, factors affecting growth, techniques of cultivation and isolation, mechanisms for their control, interactions with humans ,their role in disease and immunity and tests for sterility and antimicrobial inhibition.

Laboratory sessions include basic techniques for culturing and identifying microorganisms, observing the effect of various factors on their growth, sterilization techniques, evaluation of disinfectants and antimicrobial screening.

2. Learning objectives:

At the end of the course, the student will

- ✓ Be familiar with microbial diversity
- ✓ Characterize bacteria and viruses
- ✓ Have an understanding of microbial growth, factors affecting growth , techniques for isolation and cultivation of microorganisms.
- ✓ Have an understanding of physical and chemical methods for controlling or preventing bacterial growth.
- ✓ Describe the bacterial mechanisms of gene exchange.
- ✓ Have an understanding of physical and chemical methods for controlling or preventing bacterial growth.
- ✓ Discuss mechanisms of microbial pathogenicity and host resistance to microbes.
- ✓ Able to use appropriate aseptic techniques, microscopy, and biochemical testing to identify unknown bacteria.

3. Text Book (TB) :

Microbiology: An Introduction [Ninth edition/ higher] by Tortora, Funke and Case, 2006, Pearson Benjamin Cummings Publishing Company.

4. Reference Books (RB):

1. Pharmaceutical Microbiology, Hugo & Russel, Blackwell Publishing, 6th Ed, 2005.

2. Tutorial Pharmacy, Cooper & Gunn's, 6th Edition, CBS Publishers, 2000.

3. Microbiology a Laboratory Manual: J.G. Cappuccino & N.Sherman, 2001, Benjamin-Cummings Publishing Company.

5. Course Plan : a) *Theory Component*

Lect. No.	Learning Objectives	Topics to be covered	Ref. Chapter # (Text Book)
1-2	The science of microbiology	Introduction, importance and classification of microorganismes. Staining techniques.	1- 3
3-6	Prokaryotic and eukaryotic cells	Structure and function in general	4
7-10	Microbial growth	Media requirements, culture media, growth curve, preserving bacterial culture, obtaining pure culture	6
11-12	Physical methods of microbial control	Sterilization techniques	7
13-15	Chemical methods of microbial control	Antiseptics , disinfectants and preservatives	7
16-18	Viruses	General characteristics, Structure, Taxonomy, Isolation, cultivation and identification	13
19-20	Microbial Genetics	Genetic Transfer and Recombination in Bacteria	8
21-25	Defending the body's interior	Nonspecific defenses & specific defenses	16, 17
26-30	Disorders associated with various systems	Microbial diseases of Skin, CNS, Respiratory Tract, GIT, Immune system .	19, 21-26
31-34	Antimicrobial drugs	Targets of antimicrobial drugs, Classification with structures, mechanism of action etc.	20
35-37	Applied microbiology	Food preservation, Manufacture of antibiotics and vaccines, etc.	7 (RB1)32, 33 (RB 2)
38-40	Miscellaneous	Sterility testing, pyrogen testing, Evaluation/screening of antimicrobial drugs	Class notes

b) *Lab Components:* [List of experiments to be done]

1. Preparation & sterilization of culture media.
2. Isolation of pure cultures from mixed culture.
3. Microscopic examination of stained bacteria - Gram's staining etc.
4. Fermentation of carbohydrates.
5. Effect of following factors upon microorganisms- Temperature, Osmotic pressure, pH and UV light.
6. *In-vitro* antibacterial screening: (a) Zone of inhibition and (b) MIC
7. Evaluation of disinfectants (Phenol coefficient value).
8. Production of indole by bacteria.
9. Test for sterility.

Evaluation scheme:

S. No.	Evaluation Components	Duration	Weightage (%)	Date & Time	Remarks
1.	Mid-Sem test	1.5 hrs	25	7/10 2:00 - 3:30 PM	CB
2.	Quiz(zes)		10		CB
3	Lab component$	-	20		
4	Assignment(s)*	-	10		
5	Compre. Exams.	3 hrs	35	12/12 FN	OB + CB

* - *To be announced in the class.*

$ Day to day activities and viva – 10%, Lab Compre Exam - 10%

6. Chamber Consultation Hour: To be announced in the class.

7. Notices: Notice Board of the Pharmacy Department.

8. Make-up policy: Make-up are not generally given as a routine and will be considered for regular students only (80% attendance in lecture classes). It is solely dependent on the "genuineness" of the circumstances under which a student fails to appear in a scheduled evaluation component; however, prior permission should be sought from the instructor-in-charge.

Instructor-in-Charge

PHA F213/C241