BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE, PILANI

INSTRUCTION DIVISION

FIRST SEMESTER - 2015-2016

03/08/2015

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, Anuradha, Santosh, Pallavi Singh, Shruti R.

1.Description of Course : Introduction and classification of microbes; structure and physiology of microbial cell; infection & immunity; host parasite relationship; physical chemical methods of controlling microbes; experiments for isolation, cultivation, microbial diseases; antimicrobial chemotherapy and pharmaceutical application; sterilization and disinfection techniques.

2. Scope & Objective of the Course:

This course deals with the structure, physiology and growth of microorganisms, with the emphasis on the study of selected microbial diseases, causes , prevention and role of microorganisms in the pharmaceutical industry.

3. Text Book (TB) :

Microbiology: An Introduction [Ninth edition] by Tortora, Funke and Case, 2006, Publishers: Pearson Benjamin Cummings.

4. Reference Books (RB):

1. Pharmaceutical Microbiology, Hugo & Russel, Blackwell Publishing, 6^{th}/ 7^{th} Ed. 2005.

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

3. Microbiology a Laboratory Manual: J.G. Cappuccino & N.Sherman,1983, Addison-Wesley Publishing Company, Reading Massachusetts.

5. Course Plan :

a) *Theory Component*

Lect. No.	Learning Objectives	Topics to be covered	Reference Chapter # (Books)
1-3	The science of microbiology	Introduction, importance and classification of microorganismes. Staining techniques.	3 (TB)
4-6	Prokaryotic and eukaryotic cells	Structure and function in general	4 TB
7-9	Microbial growth	Media requirements, culture media, growth curve, preserving bacterial culture, obtaining pure culture etc.	6 (TB)
10-13	The viruses	The ultimate parasites, classification of viruses, bacteriophages & animal viruses	13 (TB)
14-15	Sterilization techniques	The way microorganisms die, physical controls on microorganisms	7 (TB)
16-18	Antiseptics , disinfectants and preservatives	Chemical controls on Microorganisms, examples of chemicals, mechanism of action and their evaluation	7 (TB) & 30(RB 2)
19-20	Microbial Genetics	Introduction of genetic material & genetic exchange among microorganisms	8 (TB)
21-25	Defending the body's interior	Nonspecific defenses & specific defenses	16, 17 (TB)
26-30	Disorders associated with various systems	Microbial diseases of Skin, CNS, RT, GIT, immune system etc.	19, 21-26 (TB)
31-34	Antimicrobial drugs	Medicinally important microorganisms , Targets of antimicrobial drugs, Classification with structures, mechanism of action etc.	3-6 (RB 1) & 20 (TB)
35-37	Applied microbiology	Production of antibiotics and Vaccines etc.	32 & 33 (RB 2)
38-40	Miscellaneous	Sterility testing, pyrogen testing, Evaluation/screening of antimicrobial drugs (*in-vitro* and *in vivo*)	23 (RB 1) & Class notes

b) *Lab Component:* [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) Minimum inhibitory concentration (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-term test	90 min	30	6/10 8:00 - 9:30 AM	CB
2.	Surprise quiz (s)		10		CB
3	Lab components	-	20		
4	Assignment(s)*	-	05		
5	Compre. Exams.	3 hrs	35	3/12 FN	OB + CB

* - To be announced in the class.

Weightage of lab components :

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

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

7. Notices: Notices concerning the course will be displayed on the Notice Board of the Pharmacy Group.

8. Make-up policy: Generally make-up will be considered for regular students only.

Instructor-in-Charge

PHA F213/C241