BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE, PILANI, Hyderabad campus
FIRST SEMESTER 2023-2024

11th August, 2023

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 F217
Course Title : Pharmaceutical Microbiology
Instructor-in-Charge : D. Sriram
Lab Instructor: D. Sriram & others (please refer timetable)

1. Course description: 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, asepsis 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 disease and role of microbes in pharmaceutical industry.

2a. Course learning outcomes: At the end of the course student can **learn the relationship between microbes and our lives**; not only for the familiar harmful effect of certain microorganisms, such as disease but also their beneficial effects.

3. Text book:

TB. Microbiology: An Introduction [Eighth edition] by Tortora, Funke and Case, 2004, Publishers: PEARSON Benjamin Cummings

4. Reference books:

R1. Pharmaceutical Microbiology, Hugo & Russel, Blackwell Publishing, 6th or 7th edition, 2005.
R2. Tutorial Pharmacy, Cooper & Gunn's 6th Edition, CBS Publishers, 2000.
R3. Microbiology a Laboratory Manual: J.G. Cappuccino & N. Sherman,1983, Addison-Wesley Publishing Company, Reading Massachusetts.

5. Course plan:

a) *Theory component*

Lect #	Learning objectives	Topics to be covered	Reference Chapter # (Book)
1	The science of microbiology	Introduction, importance, classification, observing microorganism etc.	3 (TB);
2-12	Prokaryotic and eukaryotic cells	Structure and function in general	4 TB,
13-14	The growth of micro organisms	Media requirements, growth curve, preserving bacterial culture, obtaining pure culture etc.	7 (TB)
15-16	The viruses	The ultimate parasites, classification of viruses, bacteriophages, animal viruses	13 (TB)
17-19	Medicinally important microorganisms	Various bacteria, fungi, protozoa and virus	3-6 (RB 1)
20	Sterilization techniques	The way microorganisms die, physical controls on microorganisms	7 (TB)
21	Antiseptics, disinfectants and preservatives	Chemical controls on Microorganisms, examples of chemicals, mechanism of action and their evaluation	7 (TB) 31(RB 2)

22-23	Microorganisms and human disease	Microbial mechanism of human pathogenicity	15 (TB)
24-25	Defending the body's interior	Nonspecific defenses, specific defenses, preventing disease	16, 17, 18 (TB)
26	Disorders associated with various systems	Microbial diseases of skin, CNS, RT, GIT, immune system etc.	19,21-26(TB)
27	Antimicrobial drugs	Targets of antimicrobial drugs, classification with structures, mechanism of action etc.	20 (TB)
28-29	Applied microbiology	Production of antibiotics, vaccines, dextran, in drug synthesis etc.	33 (RB 2)
30-31	Miscellaneous	Sterility testing, pyrogen testing, evaluation of antimicrobial drugs	Various sources

b) ***Lab Components:*** [LIST OF EXPERIMENTS]

1 Introduction about biosafety, & instruments used in microbiological experiments
2 Preparation, sterilization of culture media
3 Isolation of pure cultures from mixed culture
4 Microscopic examination of stained bacteria- Gram's staining
5 Bacterial motility by hanging drop method
6 Effect of Environmental factors upon microorganisms-Temperature, Osmotic pressure, pH, and UV light
7 *In-vitro* antibacterial screening [various methods] (a) Zone of inhibition and (b) Minimum inhibitory concentration (MIC) &
8 other antimicrobial screening [*In-vivo*, fungal, viral]
9 Evaluation of disinfectants (Phenol coefficient value)
10 Test for sterility of eye drops/IV injection
11 Test for pyrogen for IV injection
12 New experiment

Evaluation scheme:

EC No.	Evaluation component	Duration	Weightage (%)	Date & Time	Remarks
1.	Mid semester exam	90 min	30	11/10 - 9.30 - 11.00AM	CB
2.	Surprise quiz [3-4]	15 min each	15	Class hours	OB
3.	Lab components	-	10		OB
4.	Seminar	-	5	In November	OB
5.	Compre. exam.	180 min	40	12/12 FN	CB

7. Chamber consultation hour: To be announced in the class.
6. Notices: Notices concerning the course will be displayed on the Google class room
8. Make-up policy: Generally, make-up will be considered for regular students only (80% attendance IN LECTURE CLASSES).
Academic honesty and integrity policy: Academic honesty and integrity are to be maintained by all the students throughout the semester and no type of academic dishonesty is acceptable.

Instructor-in-charge,
PHA F217