

**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**

**Course Title : Microbiology**

**Instructor-in-Charge : D. Sriram**

**Instructor: E Madhu Rekha, Anjali G, Shruti G**

**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, 6<sup>th</sup> or 7<sup>th</sup> edition, 2005.

**R2.** Tutorial Pharmacy, Cooper & Gunn's 6<sup>th</sup> Edition, CBS Publisheres, 2000.

**R3.** Microbiology a Laboratory Manual: J.G. Cappuccino & N.Sherman, 1983, Addison-Wesley Publishing Company, Reading Massachuttes.

**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) & other antimicrobial screening [*In-vivo*, fungal, viral]
- 8 Evaluation of disinfectants (Phenol coefficient value)
- 9 Test for sterility of eye drops/IV injection
- 10 Test for pyrogen for IV injection

**Evaluation scheme:**

EC No.	Evaluation component	Duration	Weightage (%)	Date & Time	Remarks
1.	Test1	30 min	10	September 10 – September 20 (During scheduled class hour)	OB
	Test2	30 min	15	October 09 –October 20 (During scheduled class hour)	OB
	Test3	30 min	10	November 10 – November 20 (During scheduled class hour)	OB
3.	Surprise quiz [2-3]	15 min each	10	Class hours	OB
3	Lab components	-	10	Quiz will be there in every class	OB
4.	Assignment	-	5	After Test 3	OB
5	Seminar	-	5	After Test 3	OB
5.	Compre. exam.	120 min	35	TBA	OB

**7. Chamber consultation hour:** To be announced in the class.

**6. Notices:** Notices concerning the course will be displayed on the CMS/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 F213**