BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE, PILANI
FIRST SEMESTER 2019-2020

01.08.19

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 No. : **BIO F212**
Course Title : **Microbiology**
Instructor In-charge : **Ruchi Jain Dey**
Team of Instructors : **Neelima Christopher, To be announced**

1. Description of course

This course will help in understanding the basic principles of Microbiology, the classification and description of microorganisms, study of the role of microbes in human disease and in human health, and the overall benefits and uses of microorganisms.

2. Scope & Objective of the Course

The primary objective of this course is to provide a quality educational experience in a field of laboratory science. This course will provide students with a basic knowledge of the principles of bacteriology, virology, and immunology, and introduce them to recombinant DNA technology. During the course students will be encouraged to develop good laboratory techniques that will be useful in subsequent courses as well as in their careers. A clear understanding of the principles of microbiology is fundamental to the comprehension and appreciation of subsequent courses. This course encourages students to think critically and to engage in a deeper understanding of their microbial environment.

3. Text Book (TB):

1. Tortora, Gerard J & Others Microbiology: An Introduction Pearson Edu., 9th ed., 2007
2. John, Saby & S. Ramachandran Laboratory Manual for Microbiology Notes EDD , 2006

4. Reference Book (RB):

Willey, J.M., Sherwood, L.M. and Woolverton, C.J. 2008. Prescott, Harley and Klein's Microbiology, 7th Edition, McGraw Hill, India.

5. Lab Manual:

Laboratory Manual for Microbiology (BIO C241 & PHA C241), 2006, Educational Development Division, BITS, Pilani.

6. Course Plan:

Lec. No.	Learning Objectives	Topic to be covered	Chapter in the Text Book
1-2	Introduction to microbiology	The microbial world	TB-1, RB-1
3-4	Methods in Microbiology	Microscopy and Specimen preparation	TB-3, RB-2
5-6		Requirement for growth, obtaining pure cultures and maintenance	TB-6, RB-5
7-10	Study of Microbial Structures	The morphology & fine structure of bacteria	TB-4, RB-3
11-13	Microbial Growth	Growth of Microbes and its measurement	TB-6, RB-6
14-16	Microbial Physiology	Microbial metabolism	TB-5, RB-8,9,10

17-20	Microbial Genetics	The genetics of microorganisms	TB-8, RB-11,12,13
21-22	The types of Microorganisms	The characterization, classification and identification of microorganism	TB-10, 11 RB-19 (Self-study)
23-27	Study of Microbial Structures	Eukaryotic microorganisms	TB-12, RB-4 (Self-study)
28-30	To understand viruses	Virus, Viroids, Prions	TB-13, RB-16,17,18
31-33	Control of Microorganisms	Physical and chemical methods of microbial control, Antimicrobial drugs	TB-7, 20 RB-7
34-37	Microorganisms and diseases	Principles of diseases and epidemiology, Microbial Mechanisms of Pathogenicity	TB-14, 15
38-39	Environmental Microbiology	Microbiology of soil, domestic and wastewater	TB-27 RB-27,29,41
40-41	Applied Microbiology	Microbiology of food and Industrial microbiology	TB-28 RB-40,41

7. Portions for self-study:

To be announced in class from time to time.

8. Lab Components:

Exp 1 : Introduction to Laboratory, Biosafety and sanitation
Exp 2 : Preparation and Sterilization of culture media
Exp 3 : Isolation of pure cultures (Bacteria and Fungi) and quantitation of viable cells
Exp 4 : Staining and motility of bacteria- Simple staining, Hanging drop technique
Exp 5 : Staining of bacteria- negative staining, Gram's staining,
Exp 6 : Staining and visualization of Fungi
Exp 7 : Effect of environmental factors upon growth of microorganisms
Exp 8 : IMViC Test
Exp 9 : Starch hydrolysis in bacteria
Exp 10 : Assay of antibiotics
Exp 11 : Phage titration
Exp 12 : Bacterial conjugation
Exp 13 : Phenol coefficient for antimicrobial agent.
Exp 14 : Milk Microbiology

Note: *Out of the above mentioned list, maximum 10-12 experiments will be conducted in the Semester as per the availability of the consumables.*

***Note:-** Wearing lab coat and closed shoes are mandatory to enter into the laboratory.

No student will be permitted to perform the practical without lab manual.

No student will be allowed into the laboratory after 10 minutes from the beginning of the practical session.

Lab records will be evaluated for each experiment and the records need to be submitted every week.

If the student does not meet these three criteria, he/she will be sent out of the lab and will have to forego the experiment.

9. Evaluation Scheme:

EC No.	Evaluation Component	Duration	Weightage (%)	Date, Time & Venue	Remarks
1.	Mid-semester	90 min	20 (10+10)	30.09.19 (11.00 – 12.30PM)	OB+ CB
2.	Laboratory evaluation -Lab Record and End semester exam		20	Every practical will be evaluated	CB
3.	Assignments/ Surprise Quizzes		20 (10+10)	TBA	OB+ CB
4.	Comprehensive	3 hours	40 (10+30)	04.12.19 (AN)	OB+ CB

10. Chamber consultation hour: To be announced in the class.

11. Notices: All notices will be displayed on CMS/ notice board of Department of Biological Sciences.

12. **Grading policy:** Students missing one or more evaluation component(s) will be awarded Not Cleared (NC) grade**.**

13. Make-up policy: Make-up decisions will be made on a case-by-case basis and only genuine cases as determined by the team and validated by Medical Officer will be considered. No make-ups for Lab component, Quizzes and assignments.

14.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.

Ruchi Jain Dey

Instructor-in-charge

BIO F212