BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE, PILANI
FIRST SEMESTER 2022-2023

Dated:

29.08.22

Course Handout (PartII)

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 : Lecture Co-Instructor: Prof. Vidya Rajesh
Lab Instructors: Ruchi Jain Dey, Monica, Shifa

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
11-12	Microbial Growth	Growth of Microbes and its measurement	TB-6, RB-6

13-14	The types of Microorganisms	The characterization, classification and identification of microorganism	TB-10, 11 RB-19
15-16	Study of Microbial Structures	Eukaryotic microorganisms	TB-12, RB-4
17-20	Microbial Physiology	Microbial metabolism	TB-5, RB-8,9,10
21-24	Microbial Genetics	The genetics of microorganisms	TB-8, RB-11,12,13
25-27	Control of Microorganisms	Physical and chemical methods of microbial control, antimicrobial drugs	TB-7, 20 RB-7
28-31	To understand viruses	Virus, Viroids, Prions, Viral genetics	TB-13 RB-16,17,18
32-36	Microorganisms and diseases	Principles of diseases and epidemiology, Microbial Mechanisms of Pathogenicity	TB-14, 15
37-38	Environmental Microbiology	Microbiology of soil, domestic and wastewater	TB-27 RB-27,29,41
39-40	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: A full sleeve lab coat, fully covered dress (full sleeve dress and full pants) and closed shoes are essential prerequisite to enter the Microbiology lab, without which, students will not be permitted into the lab due to Biosafety reasons. Out of the above-mentioned list, maximum 10-12 experiments will be conducted in the Semester as per days available for laboratory classes. Lab records will be maintained, updated and evaluated immediately on completion of each experiment. **Only on attendance of a lab session in person, that the respective experiment will be marked, else it won't be marked.** Lab records will be evaluated for each experiment.

9. Evaluation Scheme:

EC No.	Evaluation Compo-nent	Duration	Weightage (%)	Date, Time & Venue	Nature of Component
1.	Mid-semester Exam	90 min	**25% [75M]**	04/11 1.30 - 3.00PM	10% CB (30M) + 15% OB (45M)
2.	Laboratory evaluation - Lab Record	Variable	**25% [75M]** (a) Lab Record [10%, 30M, OB]	To be announced	10% OB (30M) + 15% CB (45M)

	-Midsemester Quiz -Comprehensive Laboratory exam + Quiz		(b) Midsemester Quiz [5%, 15M, CB] (c) Comprehensive Laboratory Exam/Quiz [10%, 30M, CB]		
3.	Class attendance and Participation in class discussions/ Announced Quizzes (2)	Variable	**16.66% [50M]** Class Participation [3.3% 10M, OB] 2 Quizzes [13.3%, 40M, CB]	To be announced	3.3% OB (10M) 13.3 % CB (40M)
4.	Comprehensive Exam	3 hours	**33.33% [100M]**	28/12 FN	13.33% OB (40M) + 20% CB (60M)
# Weightage can be calculated based on total Marks: 300M.					

Notes:
Students would be assessed on the basis of their regularity in the class, interactions during the lecture and laboratory sessions. Besides the regular assessment, pre-announced quizzes, records and discussion during the laboratory sessions will also be used to observe sincerity.

10. Chamber consultation hour: Once a week we will be discussing any doubts or issues related to lectures and laboratory during the consultation session via google meet/chamber meet. Day and time will be decided in consultation with students. Contact Email ID of IC: ruchij80@hyderabad.bits-pilani.ac.in.

Email Lab related doubts to Laboratory instructors with copy to IC–
1. Monica - h20171290015@hyderabad.bits-pilani.ac.in
2. Shifa- p20180004@hyderabad.bits-pilani.ac.in

To get the most benefit of lectures and laboratory sessions, students are requested to regularly go through the study material and resolve doubts during the upcoming lectures and lab hours.

11. Notices: All notices will be displayed on CMS/ or via emails.

12. Make up policy: No make-ups will be provided for quizzes and evaluation components conducted as part of regular assessment during lecture or laboratory hours unless it is a genuine case of medical emergency or hospitalization. Prior intimation/ permission is essential along with submission of necessary documentary proof for the same.

13. **Computers, internet and textbooks:** It is expected that each student registered in a course in First Semester 2022-2023 shall acquire a Text book is available for purchase in the book stores, students are expected to purchase their text book at the beginning of the semester.

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