



GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Bachelor of Science

Level: Under Graduate

Branch Name: Honors/ Honors With Research (Biotechnology)

Course / Subject Code: BS01001041

Course / Subject Name: Human Microbial Diseases

W.e.f. Academic Year:	2024-25
Semester:	1
Category of the Course:	Minor Elective Subject (any one)

Prerequisite:	Students have the basic knowledge about the different kind of pathogen. They should be aware about the infectious and non-infectious diseases.
Rationale:	Gaining the knowledge of the diseases caused by microorganisms, would help in discovery and development of antibiotics, medicines and vaccines for prevention and treatment of diseases.

Course Scheme:

Teaching Scheme			Total Credits	Assessment Pattern and Marks				Total Marks
L	T	PR		Theory		Practical		
			ESE (E)	PA(M)	ESE (V)	PA (I)		
3	0	2	4	70	70	30	30	200

Course Outcome:

After Completion of the Course, Student will able to:

Sr. No	Course Outcomes	RBT Level
1	Evaluate the biology of various diseases	UN
2	Discover various diagnostic methods and imaging techniques	UN,RM,AP
3	Assess disease etiology, respective diagnosis,	UN,RM,AP

*RM: Remember, UN: Understand, AP: Apply, EL: Evaluate, CR: Create

Course Content:

Sr. No.	Course Content	No. of Hours	% of Weightage
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1	Overview of Human Diseases Outline about process of infection, Infectious and noninfectious diseases, Deficiency diseases, occupational diseases, Incubation period, mortality rate, nosocomial infections, biomedical waste disposal	8	18
2	Epidemiology Principles and methods of Epidemiology, Air borne, water borne, Food borne and Sexually transmitted diseases. Preventive measures (mass immunization and herd immunity) and mode of action of antibiotics	8	18
3	Microbial Diseases, Diagnostics and treatment Respiratory, gastrointestinal, Nervous system, skin, eye, urinary tract diseases, Sexually transmitted diseases. Study of recent outbreaks of human diseases (SARS/ Swine flu/Ebola/Covid) – causes, spread and control. Mosquito borne disease – Types and prevention	10	22
4	Host – Microorganism Interaction Microorganism entry, colonization, invasion, outcome, and Prevention of Disease. Microbial Virulence factors and pathogenicity Island. Epidemiology and investigation of recent pandemics (SARS). Antimicrobial resistance and Detection (MRSA/MDRTB).	10	22
5	Oncogenesis related microbes Mechanism of oncogenesis by microbes, Prevention and control of oncogenesis, Vaccine immunization and chemotherapeutic remedies and treatment of oncogenic infections	9	20

Textbook:

1. Amanullah M. Medical Biochemistry and Biotechnology LAP Lambert Academic Publishing. 2012
2. Orlicki R, Cieñciala C, Krylova LP, Pielichowski J, and Zaikov GE. Pharmaceutical and Medical Biotechnology: New Perspectives Nova publishers UK Ed.2013.

Reference Books:

1. Wilson BA, Salyers AA. Bacterial Pathogenesis: A molecular approach ASM Press, 3rdEdition. 2011.
2. Delves PJ, Martin SJ, Burton DR, Roitt IM. Roitt's Essential Immunology Wiley-Blackwell 12th Edition. 2011.



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Suggested Course Practical List:

1. Microbial Identification in Gastrointestinal Diseases Using Biochemical Tests
2. Study of Nosocomial Infections and Methods of Biomedical Waste Disposal
3. Investigation of Antimicrobial Resistance: MRSA Detection by Disk Diffusion Method
4. Assessment of Microbial Virulence Factors Using Hemolysis and Coagulase Tests
5. Isolation and Identification of Pathogens from Respiratory Infections
6. Analysis of Recent Outbreaks: Laboratory Techniques for SARS-CoV-2 Detection

List of Laboratory/Learning Resources Required:

1. <https://www.futurelearn.com/courses/human-disease-understanding-causes-of-disease>
2. <https://www.edx.org/course/population-health-disease-prevention-and-managemen>
