



**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**Integrated Master of Science (Biotechnology)**

**Semester: 5**

**Subject Name: Medical Biotechnology**

**Subject Code: 1350401**

**Teaching and Examination Scheme:**

Teaching Scheme			Credits	Examination Marks				Total Marks
L	T	P		Theory Marks		Practical Marks		
			ESE (E)	PA (M)	ESE (V)	PA (I)		
4	0	0	4	70	30	0	0	100

**Prerequisite:**

Students should have knowledge of basic cell biology, molecular biology and genetics.

**Rationale:**

This course is designed to outline the biology and diagnostics for various diseases and will be helpful in understanding the host-microbe interactions in causing infectious diseases and different methods of their relative diagnosis and prophylaxis. This course offers the utilization of medical engineering to take up research in challenging areas of therapy and diagnosis

**Course Content:**

Unit No.	Content	No. of Hours	Weightage (%)
1	<b>Human Genetics</b> History of Human Genetics , Mendelian, Extensions of Mendelism, Sex determination, Non Mendelian , Population Genetics	12	20
2	<b>Biopharmaceuticals</b> Understanding Biopharmaceutical products, Biosimilar, Blood products and therapeutic enzymes, development of various hormones, growth factors,	12	20
3	<b>Introduction to tissue engineering</b> Tissue engineering as an alternative to drug therapy, Cell delivery and recirculation, Approaches in tissue engineering, Artificial organs	12	20
4	<b>Molecular Diagnostics</b> Concept of Diseases diagnostics, Chromosomal disorder diagnosis, DNA diagnostics, immunodiagnostics, Diagnosis of certain rare diseases, Novel diagnostics tools, LAMP, CRISPER based diagnostics.	12	20
5	<b>Personalized Medicine</b> Genes to personalized medicine. Genetic variations in personalized medicine, polymorphic, genetic variations. Models for gene therapy Genetic manipulation in mouse, model for therapy monogenic disorder, polygenic disorder, multifactorial disorder, human cell xenograft	12	20
<b>Total Hours:</b>		60	



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**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 (2011) Bacterial Pathogenesis: A molecular approach ASM Press, 3rd edition.
2. Delves PJ, Martin SJ, Burton DR, Roitt IM. Roitt's Essential Immunology Wiley- Blackwell 12th Edition. 2011.

**Course Outcomes:**

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

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

**Suggested Course Practical List:**

Not Applicable

**List of Laboratory/Learning Resources Required**

1. <https://www.classcentral.com/course/molecular-techniques-6338>
2. <https://www.coursera.org/learn/personalizedmed>