
Course Objective:

This course aims to provide a foundational understanding of genomics and its applications in modern medicine. Students will learn to analyze genomic data, understand the genetic basis of diseases, and explore the role of genomics in personalized medicine. Additionally, the course will address the ethical, legal, and social implications of genomic research and its clinical applications, preparing students for future advancements and interdisciplinary collaboration in the field.

Course Outcome (CO):

1 Discuss involvement of biotechnology and genomics in medicine like gene medicine, disease models and their impact.

2 Compare between functional and comparative genomics, learning other genomics including mutational genomics.

3 Identify causative microbes , molecular epidemiology, host resistance to infection

4 List applications of genomics in genetic diseases like detection and treatment of single gene disorder.

5 Explain molecular basis of cancer, genomics impact and methods in cancer therapy

6 Perform case studies of cardiovascular and single gene disorder, therapies and application.

S.No.	Content	Contact Hours
1.	Biotechnology and Genomics in Medicine: Gene Medicine, Disease Models, Impact of Genomics on Medicine, Molecular Medicines	**7**
2.	Genomics: Human Genome Project Breakthroughs, Functional Genomics: Comparative Genomics, Transcriptomics, Proteomics, Mutational Genomics	**6**
3.	Genomics Applications in Infectious Diseases: Identification of causative microbes, molecular epidemiology, host resistance to infection, pathogenicity,combating infectious diseases	**7**
4.	Genomics Applications in Genetic Diseases: Genetic Disorders, detection and treatment of single gene disorders, analysis of polygenic disorders: linkage analysis, Linkage disequilibrium mapping, haplotypes, MHC, pharmacogenomics	**8**
5.	Genomics Applications in Cancer: Molecular basis of cancer, impact of genomics on cancer research, methods for the diagnosis of cancer, approaches to cancer therapy	**8**
6.	Case Study: Cardiovascular Disorders: Cardiovascular Single Gene Disorders, Cardiovascular Polygenic Disorders, Therapies and Applications	**6**