

SEMESTER-IV

COURSE 11: MEDICAL BIOTECHNOLOGY

Theory

Credits: 3

3 hrs/week

I. LEARNING OUTCOMES

On successful completion of the course, the students will be able to

1. Learn about diseases caused by microbial sources
2. Learn about epidemiology, pathogenicity, laboratory, diagnosis, prevention and control of bacterial diseases
3. Learn about fungal, viral and protozoan diseases
4. Learn about gene therapy and vectors used in gene therapy
5. Learn about drug discovery, therapeutic applications

II. Syllabus

UNIT-I

1. Diseases, introduction , types : genetic, chromosomal aberrations, numerical and structural autoimmune disorders
2. Disease caused by microbial sources . mechanism of pathogenicity, pathogenic islands , molecular basis of diseases
3. Antimicrobial compounds and their mode of action

Unit -II

1. Characteristics of infectious diseases, herd immunity
2. Disease cycle (source of disease , reservoir, carries) , transmission of pathogens (air borne , contact transmission , and vector transmission)
3. Bacterial diseases – epidemiology, pathogenicity, laboratory, diagnosis, prevention and control of the following diseases – tuberculosis, typhoid, tetanus, leprosy

Unit -III

1. General account of fungal diseases : mycosis , subcutaneous and deep
2. General account of viral and protozoan diseases- pneumonia, mumps, AIDS, malaria
3. Brief account of sexually transmitted diseases

Unit -IV

1. Gene therapy – *Exvivo*, *Invivo*, *In situ* gene therapy
2. strategies of gene therapy , gene augmentation
3. Vectors used in gene therapy , biological vectors – retrovirus , adeno virus, herpes. Synthetic vectors - liposomes , receptor mediate gene transfer

Unit -V

1. Introduction to drug discovery. Stem cell based drug discovery , drug screening and toxicology
2. Therapeutic applications – neurological disorders - Parkinson's diseases , Alzheimer's disease
3. Antiviral therapy for AIDS, DNA/RNA based diagnosis, hepatitis

III . Skills Outcome

On Successful Completion of this Course, Student shall be able to

1. Learn about Laboratory Safety Regulations
2. Learn about staining techniques
3. Learn about Culture of bacteria and its cultural characteristics
4. Learn about serological diagnosis of diseases