

SEMESTER-IV

COURSE 11: MEDICAL BIOTECHNOLOGY

Practical

Credits: 1

2 hrs/week

1. Laboratory Safety Regulations
2. Culture media & isolation of pure culture
3. Smear Preparation & Simple stain
4. Gram stain
5. Culture of bacteria and its cultural characteristics
6. C Reactive protein test
7. Widal test
8. Serological diagnosis of tuberculosis
9. Serological diagnosis of HIV
- 10.

V. REFERENCES

1. Text book of microbiology R. Ananthanarayana and C.K. Jayaram Paniker, Orient longman 1997
2. Medical microbiology , vol 1 microbial infections : Mackie and MaCarty, Churchill Livingstone 1996
3. Bailey and Scotts Diagnostic microbiology : Baron EJ Peterson LR and Finegold SM Mosby 1990
4. Broude A.I (1981) Medical microbiology and infectious diseases , W.B Saunders &Co Philadelphia

VI. CO-Curricular Activities

a) Suggested Co-Curricular Activities

1. Assignments
2. Seminars, Group Discussions on related topics
3. Charts / models on bacterial/fungal/ viral / protozoan diseases

SEMESTER-V

COURSE 12: INDUSTRIAL 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 industrially important microorganisms
2. Learn about bioreactor and its types
3. Learn about production of different substances through fermentation
4. Learn about industrial enzymes
5. Learn about industrially produced amino acids and vitamins.

II. Syllabus

Unit I

1. Isolation, Screening, Preservation and Improvement of Industrially Important Microorganisms.
2. Synthetic and Natural Medium, Precursors, Antifoams,
3. Sterilization Methods and Inoculum Preparation.

Unit II

1. Definition of bioreactor, basic principles of bioreactor.
2. Classification of bioreactors.
3. Analysis of batch, continuous, fed batch and semi-continuous bioreactors.

Unit III

1. Ethanol Production by Fermentation using Molasses, Starchy Substances.
2. Production of Alcoholic Beverages like Beer and Wine.
3. Production of Citric Acid by Submerged and Solid State Fermentations.

Unit IV

1. Sources of Industrial Enzymes, Production of Microbial Enzymes like Amylase and protease.
2. Baker's Yeast and SCP Production.
3. Production of Antibiotics : Penicillin streptomycin

Unit V

1. Amino Acid Production
2. Vitamin Production- Vitamin B12
3. Production Of Recombinant Proteins Having Therapeutic And Diagnostic Applications
(Insulin, Growth Hormone, Recombinant Vaccines, Monoclonal Antibody).

III. Skills Outcome

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

1. Learn about different isolations of microorganisms from various sources
2. Learn about production of alcohol and wine
3. Learn about citric acid fermentation