

MOHANLAL SUKHADIA UNIVERSITY, UDAIPUR

B. Sc. BIOTECHNOLOGY III YEAR TDC (2016-17)

Paper I : *Microbial Technology*

Unit-I

Introduction to industrial biotechnology, basic principles of fermentation technology, fermentation media – natural and synthetic media, fermenters and bioreactors – construction, design and operation. Process of aeration, agitation, temperature regulation and filtration method, Types of fermentation – solid state, submerged and continuous fermentation.

15 Credit hours

Unit-II

Process development – Shake flask fermentation, down stream processing, disintegration of cells, separation, extraction, concentration and purification of products, quality control, quality assurance, standard operating procedures and good manufacturing practices.

15 Credit hours

Unit-III

Production of microbial products, Brief account of the following products obtained by industrial microbiological fermentation – Alcohol, Alcoholic Beverage-Beer, Organic acid – Citric acid, Antibiotic – Penicillin, Amino acids – Glutamic acid, Vitamin-B12. Brief account of steroid biotransformation.

15 Credit hours

Unit-IV

Food processing; food spoilage – bacterial, fungal and yeast; food preservation – principles and general methods, elementary idea of canning and packing; sterilization and pasteurization of food products; technology of fermented foods – Yoghurt, Buttermilk, Idli, Dosa, Cheese, Tempeh, Olive, Sausages.

15 Credit hours

Unit-V

Microbial foods – Single Cell Proteins (SCP), Single Cell Oils (SCO); Hazard Analysis and Critical Control (HACCP) concept; Techniques of mass culture of Algae-spirulina; Microbial polysaccharides and polyesters; production of xanthan gum and polyhydroxyalkaloides.

15 Credit hours

Suggested Reading

1. Waites, Morgan, Rockey. Industrial Microbiology. Blackwell Science.
2. Saha, B.D. Fermentation Biotechnology. American Chemical Society.
3. Demain and Davies . Industrial Microbiology and Biotechnology. A.S.M. Press Washington.
4. Glazer, A.N. and Nikaido, H. Microbial Biotechnology : Principle and application of applied microbiology. W.H. Freeman and com.
5. Stanbary, Whitaker and Hall. Principles of Fermentation Technology.
6. Shuler and Kargi. Bioprocess Engineering. Pearson.
7. Mukherji, K.G. Microbial Technology. APH. Pub. Corp.
8. Ray. Fundamental Food Microbiology. CBH Pub.
9. Bell, Neaves and Williams. Food Microbiology and Laboratory Practice. Panima.