

UCH722 FERMENTATION TECHNOLOGY

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Introduction to fermentation technology: History, Types of fermentation, Examples of fermentation industry.

Microbial growth kinetics: Growth, Substrate utilization and product formation.

Fermentation media: Formulation, Carbon, Nitrogen, Oxygen, Mineral sources, etc.

Sterilization: Sterilization of air and medium; Sterilization of fermenters, Thermal death kinetics of microorganisms

Bioreactor design: Material and energy balances in bioprocess - Open and closed systems, Steady-state and non-steady state systems, Reacting and non-reacting systems.

Bioreactor operation systems: Stirred tank reactor (batch, semi-batch, continuous), Bubble column, Airlift and packed bed.

Physical processes in fermentation system: Fluid flow and mixing, Mass and heat transfer.

Text Books:

1. Stanbury, P.F. and Whitaker, A., and Hall S. J. Principles of Fermentation Technology, Pergamon Press (2007).
2. Doran, P.M., Bioprocess Engineering Principles, Academic Press (1995).

Reference Books:

1. Aiba, S., Humphrey, A.E. and Millis, N.F., Biochemical Engineering, Academic Press (1973).
2. Bailey, J.E. and Ollis, D.F., Biochemical Engineering Fundamentals, McGraw-Hill (1986).
3. Shuler, M.L. and Kargi, F., Bioprocess Engineering: Basic Concepts, Prentice-Hall (1992).