

**SARDAR PATEL UNIVERSITY**  
**Programme: BSC (MICROBIOLOGY)**  
**Semester: V**  
**Syllabus with effect from: June 2013**

<b>Paper Code:</b> US05CMIC06	<b>Total Credit: 3</b>
<b>Title Of Paper:</b> Fermentation Technology	

Unit	Description in detail	Weighting (%)
<b>1</b>	Range of fermentation processes. Up stream and Down stream processing Characteristics of industrially important microorganisms, Primary screening of organic acid producers, Primary screening of antibiotics, growth factors, and enzyme producers. Significance of secondary screening	
<b>2</b>	Strain improvement: Mutation-spontaneous and induced mutations, Reaction mechanism of mutagens (physical and chemical mutagens). Recombination-Sexual and parasexual cycle, protoplast fusion. Genetic technology. Isolation of auxotrophic mutant for primary (Lysine) and secondary (Penicillin) Metabolite. Ideal characteristics of fermentation medium. Role of precursors, inhibitors and inducers in fermentation medium	
<b>3</b>	Fermentor Design - Basic functions of fermentor and design Structural components of fermentor Types of fermentor - Stirred tank reactor, Air lift fermentor Types of fermentation - Submerge (Batch, Fed batch and Continuous), Solid state fermentation Monitoring and control of process parameters (Temperature, pH, DO, foam).	
<b>4</b>	Principles of medium sterilization Methods of sterilization - Batch and Continuous Sterilization of air Criteria for ideal inoculum Inoculum development and its addition Introduction to mass transfer of oxygen, Factors affecting $k_{la}$ Sampling Scale up and Scale down	

**Basic Text & Reference Books:**

- Principles of Fermentation Technology - Stanbury, Whitaker and Hall
- Biotechnology - Crueger and Crueger.
- Industrial Microbiology- A.H. Patel
- Fermentation technology - H. A. Modi
- Industrial Microbiology - Cassida, L.E.

