

**SARDAR PATEL UNIVERSITY**  
**Programme: B.Sc (Chemistry)**  
**Semester: III**  
**Syllabus with effect from: JUNE 2012**

<b>Paper Code: US03ECHE02</b>	<b>Total Credit: 2</b>
<b>Title Of Paper: Industrial Chemistry-I</b>	

Unit	Description in detail	Weighting (%)
I	<p><b>Mass And Energy Balance Calculations</b>                      Elementary concepts of unit operations and unit processes, flow sheet preparation, concept of mass balance and type of mass balance problems, strategy and guide for mass balance calculations for non-reactive and reactive system, recycle operation and purge operation by pass operation, energy balance for batch and continuous processes.</p>	
II	<p><b>Fluid Flow</b>                      Pumps :Definition, Classification of Pumps, Centrifugal pumps, Construction/component parts of Centrifugal pumps, working of a centrifugal pump, advantages and disadvantages of centrifugal pumps, air binding and priming, Reciprocating pumps: Construction/components of a reciprocating pumps, working and types of reciprocating pumps, Piston pumps, Plunger pumps, Diaphragm pumps, Gear pumps, Comparison of Centrifugal pump with Reciprocating pump.</p> <p><b>Heat Transfer</b>                      Heat transfer equipments, Heat exchangers: Shell and Tube type heat exchanger, Double type heat exchanger, Finned tube heat exchanger, Plate-type heat exchanger.</p>	
III	<p><b>Industrial Instrumentation</b>                      Expansion thermometers: Introduction, Temperature scale, Constant- volume gas thermometer, Mercury in glass thermometer, Bimetallic thermometer, Pressure-Spring thermometer; Thermocouples: Industrial thermocouples, Thermocouple lead wires, Thermal Wells; Resistance thermometers: Null-Bridge Resistance thermometers, Deflectional Resistance thermometer, Pyrometers: Radiation and Optical pyrometer, Measuring elements for Gauge pressure and vacuum.</p>	
IV	<p><b>Utilities</b>                      Water : Introduction, the common impurities, Determination of hardness, water for steam making, methods of boiler water treatment, Internal treatment of boiler water, Blow down, Treating brackish and saline water, water for high pressure boilers, supercritical boilers, Nuclear power plants, Calculations of water treatment problems, Introduction to refrigeration system.</p>	

**Basic Text & Reference Books :-**

- Introduction to Process Calculation Stoichiometry by K. A. Gavhane.
- Unit Operation Vol. I and II by K. A. Gavhane.
- Industrial Instrumentation by Donald P. Eckman (Willey Estern Ltd.).
- Chemistry of Engineering Materials by C. V. Agrawal (Tara Publication).
- As Text book of Refrigeration and Air-conditioning by R. S. Khurmi and J. K.Gupta.

