UCH605 PROCESS UTILITIES AND INDUSTRIAL SAFETY

L	T	P	Cr
3	1	0	3.5

Course Objectives:
To gain knowledge about different process utilities used in the chemical process industry and issues related to hazards & safety.

Water: Water resources, Storage and characterization, Conditioning.

Steam: Boilers, Steam Handling and distribution, Steam nozzles, Condensate utilization, Steam traps, Flash tank analysis, Safety valves, Pressure reduction valves, Desuperheaters.

Air: Air compressors, Vacuum pumps, Air receivers, Distribution systems, Different types of ejectors, Air dryers.

Hazards and Safety: Classifications and assessment of various types of hazards, Risk assessment methods, General principles of industrial safety, Hazards due to fire, explosions, toxicity and radiations, Industrial hygiene, Maximum allowable concentration and threshold limit value, Protective and preventive measures in hazards control, Introduction to industrial safety regulations.

Case studies of hazardous incidents in industries using HAZOP.

Course Learning Outcomes (CLO):

The students will be able to:

1. calculate the requirements of water and air and their applications as utilities.
2. calculate the steam requirement and its applications as utility.
3. evaluate and apply the various risk assessment methods in industries.
4. do the hazard analysis for different industries using HAZOP.

Text Books:

1. *Vasandhani, V. P., and Kumar, D. S, Heat Engineering, Metropolitan Book Co. Pvt. Ltd. (2009).*
2. *Crowl, D.A. and Louvar, J.F., Chemical Process Safety-Fundamentals with Applications, Prentice Hall, (2002).*

Reference Books:

1. *Lees, F.P., Prevention in Process Industries. Butterworth's (1996).*
2. *Peavy, H. S., and Rowe, D. R, Environmental Engineering, McGraw Hill (1985).*
3. *Banerjee, S., Industrial Hazards and Plant Safety, Taylor & Francis 2003).*
4. *Sanders, R. E. Chemical Process Safety-Learning from Case Histories, Oxford (2005).*
5. *Perry, R.H., and Green, D. W, Chemical Engineer's Handbook, McGraw Hill (1997).*

Evaluation Scheme:

S. No.	Evaluation Elements	Weightage (%)
1	MST	30
2	EST	45
3	Sessional (May includes tutorials/ assignments/ quiz's etc)	25