CHE403XS3: Industrial Waste Management and Cleaner Production
(45 Hours of lectures and tutorials)

Objectives:

- Characterize industrial wastes
- Apply waste minimization techniques
- Perceive the value addition to wastes
- Formulate cleaner production options in industries

Syllabus:

- Characterization of Industrial waste:Waste from different industrial processes, types of waste, toxic substances in industrial waste, analytical techniques for characterization.
- Minimization and management of Industrial waste:Waste minimization and management methodologies, technical and economic advantages, waste minimization techniques, case studies on selected industries.
- Value addition to industrial waste:Reduce, reuse, recycling and recovery of valuable substances from waste, use of industrial waste in other industries.
- Cleaner production in industries: Resource depletion and global environmental issues, introduction to cleaner production, cleaner production process flow diagrams, quantification of resource flows, costing of resource flows, generation of cleaner production options based on waste causes, cleaner production techniques, screening and feasibility analysis of cleaner production options, industrial safety and different ISO standards such as ISO 14001, ISO 9001.

Evaluation:

- In-course Assessments 30%
- End-of-course Examination 70%

Recommended Readings:

- John P. Samuelson, "Industrial Waste: Environmental Impact, Disposal and Treatment", Nova Science Publishers Inc, 2009.
- John Pichtel , "Waste Management Practices: Municipal, Hazardous, and Industrial", CRC Press, Second Edition, 2014.
- Kenneth L. Mulholland, "Identification of Cleaner Production Improvement Opportunities", John Wiley & Sons. Inc., 2006.
- N. Cheremisinoff, "Waste minimization and cost reduction for the process industries", Elsevier Science, 2013.