

## CHE-848 Gasification Processes

**Credit Hours:** 3

**Pre-requisites:** Nil

### Course Objectives

- To familiarize the graduate students with gasification technology.
- To understand all aspects of the gasification process, gasification kinetics, thermodynamic modeling, gasification process design & related technical and environmental issues

### Course Contents

- Introduction to the historical development of gasification & Thermodynamic of gasification
- Modeling of gasification process & Optimizing process conditions
- Kinetics of gasification and Reactor theory
- Feedstock and feedstock characteristics & Gasification processes
- Fluid bed gasifiers, Oil gasification, Biomass gasification & Gasification of wastes
- Gasifiers design and related technical issues & Auxiliary technologies
- Economics, environmental and safety issues
- Details of lab work, workshops practice (if applicable)

### Course Outcomes

- After doing this course, students will learn about all gasification techniques
- Will learn how to apply them in the energy related projects of the industry.

### Recommended Reading (including Textbooks and Reference books):

- Gasification By C. Higman and M. Vaan der Burgt
- Reactive flows, diffusion and transport: from experiments via mathematical By WilliJäger, Rolf Rannacher, J. Warnatz
- Computational methods for fluid dynamics by Joel H. Ferziger, MilovanPerić
- Control and optimization of multiscale process systems By Panagiotis D. Christofides