

## **Heat Integration-Grassroots Designs and Retrofit**

This course covers most of the tools that have been developed in the last 25 years to perform the analysis, retrofit and grassroots design of heat integration systems. The course includes pinch analysis, heat exchanger networks, retrofit of heat exchanger networks, some examples of process modifications to improve energy efficiency and solutions for integration in the total site.

The course is suitable for design engineers, project managers, as well as R&D engineers. The course includes hands-on exercises that are solved in the classroom by hand. Several demonstrations of advanced material are also included, mostly in the second day. An analysis of the tools available from different software vendors is also performed.

The instructor is a Professor at the Chemical Engineering Department and Director of the Center for Engineering Optimization of the University of Oklahoma. He holds a Ph.D. from the California Institute of Technology and has been a Professor in Argentina and has performed research and teaching at UCLA. His industrial experience includes a six-year project to build a heavy water plant in Argentina, several consulting work and a three years position at Simulation Sciences (SIMSCI), where he participated in conceptual development, software programming and on-site training and sales projects. He has several publications in the area of design, heat integration and data reconciliation.

Course Duration: Two Days.

### **Day 1.**

- Introduction to Pinch Analysis.
- Energy targets, Area targets and Capital Cost Targets.
- Supertargeting
- Heat Exchanger Networks for Maximum Energy Recovery.
- Split and non-Split networks
- Energy relaxation.

### **Day 2.**

- Introduction to Flexible Pinch Designs.
- Allocation of Multiple Utilities
- Use of heat pumps and Heat Engines.
- Total Site Heat Integration
- Introduction to Retrofit of Energy Recovery Systems