

## SC-SS15: INTRODUCTION TO STEADY STATE PROCESS SIMULATION (CHEMICALS FOCUS)

### OBJECTIVES

The course content covers the basic needs of process simulation users. The basic unit operations are introduced in a stepwise manner with the objective of being able to build flowsheets by the end of the course. The use of several software functionalities will show users how to explore operating alternatives for the processing plant units that are being studied.

The concepts acquired during the course will allow engineers to build their own process simulation cases to solve problems in their daily design studies. Basing decisions on rigorous simulation results will lead to better and quicker decision making and furthermore improve confidence in the decisions taken.

### PARTICIPANTS

This course is intended for chemical and process engineers beginning to use Aspen Plus as well as for those who already use it but who need a refresher to experiment with new software features or extend the applications they use process simulation for.

The course content is aimed at process engineers, control engineers, safety and environmental engineers, planning engineers and engineers from other departments where process simulation is or could be in use.

### CONTENTS

The course has been designed to include many hands-on exercises to facilitate a more efficient and interesting learning experience. Theory is used to introduce the objectives of every module in the course as well as to help attendees to understand how the underlying calculations are performed.

## TWO-DAYS COURSE AGENDA

MODULE	MODULE TITLE AND SHORT DESCRIPTION	TIME	DAY
1	<p><b>INTRODUCTION TO THE PROCESS SIMULATOR</b></p> <p>Modeling and simulation of steady-state processes in the more general framework of Computer Aided Process Engineering and of specialized software tools. During this module, the following topics will be covered:</p> <ul style="list-style-type: none"> <li>• Overview of specialized software tools;</li> <li>• Tools for Computer Aided Process Engineering (CAPE);</li> <li>• Process simulators.</li> </ul>	1 hour	Day 1
2	<p><b>FLWSHEETING</b></p> <p>Key concepts required to solve the mass and energy balances of steady-state processes with the techniques of process flow-sheeting. The attendees are introduced to the new features of Aspen Plus program and take the first hands-on experience with sequential-modular resolution of recycles thanks to the supplied exercises. The content of the module covers the following topics:</p> <ul style="list-style-type: none"> <li>• Overview of Aspen Plus;</li> <li>• Basic flow-sheeting;</li> <li>• Advanced flow-sheeting.</li> </ul>	7 hours	
3	<p><b>PHYSICAL PROPERTIES THEORY</b></p> <p>This module provides the thermodynamic theory and practical background to describe accurately physical properties and phase equilibria of fluid mixtures for process simulation. The module covers the following topics:</p> <ul style="list-style-type: none"> <li>• Introduction and importance of physical properties for process simulation;</li> <li>• Liquid-vapour equilibria and thermodynamic theory recap;</li> <li>• Equations of state;</li> <li>• Activity coefficient methods.</li> </ul>	6 hours	Day 2
4	<p><b>UNIT OPERATIONS: GENERALITIES</b></p> <p>This module examines, in more detail the unit operations modeling features of Aspen Plus for the benefit of engineers. The following topics are covered:</p> <ul style="list-style-type: none"> <li>• Overview of available unit operations models;</li> <li>• Multicomponent distillation;</li> <li>• Compressors;</li> <li>• Heat Exchangers.</li> </ul>	2 hours	