

CHEMICAL ENGINEERING

1.1. Identification

University:	Kungliga Tekniska Högskolan (Stockholm)										
School:	School of Chemical, Science and Technology										
Course:	Chemical Engineering										
ECTS:	9										
Semester:	<i>Winter</i>					<i>Summer</i>				X	
Category	<i>Fundamental course</i>				X	<i>Specialisation course</i>					
Module	<i>MFI</i>	X	<i>MFII</i>		<i>MFIII</i>		<i>MSI</i>		<i>MSII</i>		<i>MSIII</i>
Teachers:	Luis Moreno										
Language:	<i>English</i>	X	<i>Italian</i>		<i>Swedish</i>	X	<i>Spanish</i>				

1.2. Learning-outcomes

- knowledge about advanced industrial separation processes, in order to find suitable solutions to real chemical engineering problems by using experience and judgement
- knowledge about the fundamentals of energy optimization in industrial processes

1.3. Competencies

▪ General

- to analyse and solve complex problems on environmental issues of industrial processes
- to have critical understanding of technical and scientific tools
- to work and manage teams
- communication skills (both written and oral)
- to work in an international context

▪ Specific

- to get a deep understanding on the general fundamentals on mass and energy balances, phase equilibria and kinetics
- to relate the basic theoretical principles to specific separation processes
- to identify proper separation methods for practical separation problems.
- To analyse a separation problem and suggest proper solutions to obtain an effective separation process or to improve an existing separation process.
- To solve different kind of separation problems.
- To describe and compare the different separation processes, their characteristics and applications.

- To explain how different variables, physical properties and momentum, heat and mass transport influence a specific separation process and what impact they have on the design of the equipment.
- To design simple separation equipment.
- To plan and perform laboratory experiment to support and evaluate or achieve solutions to a separation problem.
- To apply equilibrium equation for more complex separations in multicomponent system and nonideal systems.

1.4. Contents

Fundamentals, basic requirements, and design principles for separation processes. Detailed descriptions and analyses of common unit operations. The fundamental mechanisms of phase equilibria and mass and/or heat transport. Mathematical formulations of these mechanisms for the design. as well as matters concerning the practical design of apparatus. Other empirical design methods.

1.5. Teaching Methodology

- Lecture sessions
- Practical sessions: "cooperative work" for solving practical exercises
- laboratory sessions

1.6. Evaluation

- written exams
- oral evaluation of the separation problems
- oral evaluation of laboratory work

1.7. Bibliography

- Coulson & Richardson's Chemical Engineering Vol. 1, 6th Ed. and Vol. 2, 5th Ed., Butterworth-Heinemann, Course compendium.