

Course: Exergy & Process Integration

credits: 4

Course code	WBVH19EPI	Modes of delivery	Assignment
Name	Exergy & Process Integration		Education
Study year	2019-2020		Problem-based learning
ECTS credits	4	Assessments	Energy & Pinch Analysis - Assignment
Language	English		
Coordinator	D.A.G. Kurstjens		

Learning outcomes

For simplified continuous production process installations, the student is able to:

- Build an Excel model to calculate mass and energy balances, temperatures and heat exchange in simple processes, and use Visual Basic for elementary sensitivity analysis.
- Recognize and quantify exergy losses in installations and energy conversion systems.
- Construct and interpret 3 diagrams: Stream temperatures diagram, Heat Exchanger Network diagram and the T-H diagram with hot and cold composites.
- Apply the pinch concept to heat exchange problems, and calculate required mass flows and temperatures.
- Assess the feasibility of heat pumps and heat networks to valorize residual heat.
- Design an heat exchanger network (adapted PFD) for maximum heat exchange in a simple process, based on a T-H diagram and HEN diagram.

Content

To increase energy efficiency of industrial processes, chemical/process and mechanical engineers need to improve unit operations and utilities in an integrated way. To do so, all engineers need to understand the concept of exergy losses and recognize possibilities for decreasing these losses. This course offers a common visual language, skills and tools that enable the design of heat exchanger networks that maximize re-use and cascading of heat. This course also deals with the correct integration of heat pumps and district heating, and with optimizing mass flows for efficient heat exchange in various equipment.

Included in programme(s)

Minor Energy Efficiency in the Process Industry
Exchange Energy Efficiency in the Process Industry (autumn)

School(s)

Institute of Engineering