

Module Title Systems Engineering	Reference EN4702 SCQF SCQF Level 10 SCQF Points 15 ECTS Points 7.5 Created May 2002 Approved March 2004 Amended August 2011 Version No. 3
Keywords Systems Engineering, Process Plant, Pressure Vessels, Pipelines, Heat Exchanger, Nde Methods.	

This Version is No Longer Current

The latest version of this module is available [here](#)

Prerequisites for Module

Failure Analysis (EN4701) or its equivalent.

Corequisite Modules

None.

Precluded Modules

None.

Aims of Module

To provide the student with the ability to assess engineering plant systems behaviour, operation and performance.

Learning Outcomes for Module

Heat exchanger networks in process plant. Combined heat and power systems: process heat. Grand composite curves for heat transfer. Optimisation of networks, pinch technology. Integration of heat and power requirements.

Non-destructive evaluation techniques to measure component and system integrity; safety and life prediction.

Indicative Student Workload

	Full Time	Part Time
<i>Contact Hours</i>		
Assessment	3	3
Lectures	30	30
Tutorials	12	12
<i>Directed Study</i>		
Directed Self-Study/Coursework Preparation	35	35

On completion of this module, students are expected to be able to:

1. Evaluate the matching of electrical and mechanical engineering plant systems using qualitative, quantitative and simulation techniques.
2. Evaluate techniques and procedures used in the structural and dynamic verification of process piping and pressure vessels.
3. Use appropriate techniques to develop optimum solutions for heat exchanger networks in process plant as part of combined heat and power systems.
4. Use non-destructive evaluation techniques in their application to system elements safety and system life prediction.

Indicative Module Content

Analysis of plant systems involving the interaction of mechanical and electrical components.

Design procedures used in process piping/pressure vessel systems. Overview of compliance code software packages. Compliance code

Private Study

Private Study

70

70

Mode of Delivery

The module will be delivered by means of lectures, tutorials and workshops and student centred learning.

Assessment Plan

	Learning Outcomes Assessed
Component 1	4
Component 2	1,2,3

Component 2 is a closed book examination. (70% weighting)

Component 1 is coursework which involves non-destructive evaluation techniques. (30% weighting)

Indicative Bibliography

1. SMITH, E., 1996. Thermal Design of Heat Exchangers. Chichester: Wiley.
2. SOUMERAI, H., 1987. Practical Thermodynamic Tools for Heat Exchanger Design Engineers. New York: Wiley.
3. Nitsche, Manfred, and Gbadamosi, Raji Olayiwola, 2016. Heat exchanger design guide : a practical guide for planning, selecting and designing of shell and tube exchangers. Amsterdam : Elsevier

design procedures: BS5500;
ANSI B31.4. Pipe stressing
due to deadweight, design
pressure and temperature.

Ltd., [2016].