

Module Title Industrial Plant	Reference EN3700 SCQF SCQF Level 9 SCQF Points 15 ECTS Points 7.5 Created May 2002 Approved March 2004 Amended August 2011 Version No. 2
Keywords Heat Transfer, Heat Exchangers, Power Cycles, Combined Heat And Power, Fluid Machinery, Dimensional Similarity.	

This Version is No Longer Current

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

Prerequisites for Module

Thermofluids 2 (EN2702) or equivalent.

Corequisite Modules

None.

Precluded Modules

None.

Aims of Module

To provide the student with the ability to evaluate the application of thermofluids to the performance characteristics and design of plant equipment and energy systems.

Learning Outcomes for Module

Fluid machinery. Rotodynamic and positive displacement machines, cavitation. Dimensionless performance parameters. Interaction with external system, matching and machine performance characteristics.

Indicative Student Workload

	Full	Part
<i>Contact Hours</i>	Time	Time
Laboratory	3	3
Lectures	36	36
Tutorials	12	12

Private Study

Private Study	99	99
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Mode of Delivery

This module is based on lectures and tutorials supplemented with directed study and laboratory work.

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

1. Analyse the performance characteristics of heat transfer equipment for gas and liquid flow systems.
2. Analyse the performance of gas, vapour and combined cycles, used for power generation and process heat supply.
3. Analyse the behaviour of rotodynamic machines and their interaction with fluid system requirements.

Indicative Module Content

Heat transfer mechanisms, convective heat transfer coefficients, dimensional analysis, correlations for laminar and turbulent flow. Heat exchangers.

Energy systems: Plant power & heat requirements; process heat, integration of heat and power. Prime movers - gas turbines and steam turbines. CHP systems.

Assessment Plan

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

Component 1 is coursework and a written laboratory report covering either LO 1 or 3.
(30% weighting)

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

Indicative Bibliography

1. EASTOP, T. D. and McCONKEY, A., 1993. Applied Thermodynamics for Engineering Technologists. 5th ed. Harlow: Longman.
2. TURTON, R. K., 1995. Principles of Turbomachinery. 2nd ed. London: Chapman and Hall.
3. ROGERS, G. F. C. and MAYHEW, Y. R., 1992. Engineering Thermodynamics Work & Heat Transfer. 4th ed. Pearson Education Ltd.