

Module Details	
Module Title	Process Design
Module Code	CPE7014-B
Academic Year	2023/4
Credits	20
School	Department of Chemical Engineering
FHEQ Level	FHEQ Level 7

Contact Hours	
Type	Hours
Lectures	36
Tutorials	12
Directed Study	156
Seminars	Advanced process design: constraints on process design; chemical, technical, environmental, safety and economic. Shortcut techniques for capital and operating cost estimation (breakeven point, cash flow). Reaction and recycle structures of flowsheets. Mass and Energy balance around process flowsheet. Synthesis of separation trains, order of columns within distillation units. Heat exchange networks and process integration. Process safety, health and the environment.

Availability	
Occurrence	Location / Period
BDA	University of Bradford / Semester 1

Module Aims
Enable students to practice advanced principles of process Design, starting from a knowledge of the chemistry involved and taking into account chemical, technical, environmental, safety and economic constraints

Outline Syllabus
Advanced process design: constraints on process design; chemical, technical, environmental, safety and economic. Shortcut techniques for capital and operating cost estimation (breakeven point, cash flow). Reaction and recycle structures of flowsheets. Mass and Energy balance around process flowsheet. Synthesis of separation trains, order of columns within distillation units. Heat exchange networks and process integration. Process safety, health and the environment.

Learning Outcomes	
Outcome Number	Description
01	Describe typical schemes for maximising the selectivity of a process, depending on the underlying chemistry; and describe methods for designing separation trains and heat exchange networks.
02	Construct flow sheets for a given chemical process starting from a knowledge of the chemistry; perform approximate material balances, estimate capital and operating costs of a process; and evaluate a proposed process against the constraints (safety, health, technical).
03	Obtain relevant chemical and process data and apply these in the chemical process design; and enhance communication (writing) .

Learning, Teaching and Assessment Strategy
<p>Lectures and examples classes. All module learning outcomes are assessed via an individual project. This will include a completion of: (i) process selection (ii) develop process flowsheet (iii) carry out the preliminary mass and energy balance on the given design project.</p> <p>Supplementary assessment: As initial.</p>

Mode of Assessment			
Type	Method	Description	Weighting
Summative	Coursework - Written	An individual project covering advanced aspects of process design (4000 Words)	100%

Reading List
To access the reading list for this module, please visit <a href="https://bradford.rl.talis.com/index.html">https://bradford.rl.talis.com/index.html</a>

*Please note:*

*This module descriptor has been published in advance of the academic year to which it applies. Every effort has been made to ensure that the information is accurate at the time of publication, but minor changes may occur given the interval between publishing and commencement of teaching. Upon commencement of the module, students will receive a handbook with further detail about the module and any changes will be discussed and/or communicated at this point.*

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