

Module Details	
Module Title:	Process Design
Module Code:	CPE6005-B
Academic Year:	2019-20
Credit Rating:	20
School:	Department of Chemical Engineering
Subject Area:	Chemical and Process Engineering
FHEQ Level:	FHEQ Level 6
Pre-requisites:	
Co-requisites:	

Contact Hours	
Type	Hours
Lectures	36
Tutorials	12
Directed Study	152

Availability	
Occurrence	Location / Period
BDA	University of Bradford / Academic Year (Sept - May)

Module Aims
Introduce students to the principles of Process Design, starting from a knowledge of the chemistry involved and taking into account the constraints: chemical, technical, environmental, safety and economic.

Outline Syllabus
Introduction to process synthesis: The constraints on process synthesis; chemical, technical, environmental, safety and economic. Shortcut techniques for capital and operating cost estimation (break even 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

1	Describe typical schemes for maximising the selectivity of a process, depending on the chemistry; describe methods for designing separation trains and heat exchange networks.
2	Construct flow sheets for a given chemical process starting from a knowledge of the chemistry; perform approximate material balances using shortcut procedures to estimate capital and operating costs of a process; evaluate a proposed process against the constraints (safety, health, technical).
3	Obtain relevant chemical and process data and apply these in the chemical process design; communication (writing) and interpersonal (teamwork).

Learning, Teaching and Assessment Strategy

Lectures and examples classes. All module learning outcomes are assessed via a group project and examination.

Group project: To complete (i) process selection (ii) develop process flowsheet (iii) carry out the preliminary mass and energy balance on the given design project.

Note: This group project will be linked to final year Design Project and 1 hr/week tutorial will be provided by the Design Project supervisors. Individual mark will be assigned based on peer review.

Supplementary assessment: Group project marks will be carried forward. Detailed description is as above. Individuals failing the group project will be assigned a similar project to carry out as supplementary.

Mode of Assessment

Type	Method	Description	Length	Weighting
Summative	Examination - closed book	Formal Examination 2 hours	2 hours	50%
Summative	Coursework	Group report (50%) - Individual contribution 2000 words (+figures and tables)	0 hours	50%

Reading List

To access the reading list for this module, please visit <https://bradford.rl.talis.com/index.html>.

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.