UNIVERSITY of BRADFORD

# Module Descriptor

| Module Details | |
|---|---|
| Module Title | Process Design |
| Module Code | CPE6005-B |
| Academic Year | 2024/5 |
| Credits | 20 |
| School | School of Engineering |
| FHEQ Level | FHEQ Level 6 |

| Contact Hours | |
|---|---|
| Type | Hours |
| Lectures | 30 |
| Tutorials | 10 |
| Directed Study | 160 |

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

## 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 | |
|---|---|
| Outcome Number | Description |
| 01 | Describe typical schemes for maximising the selectivity of a process, depending on the chemistry; 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 using shortcut procedures to estimate capital and operating costs of a process; 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; communication (writing) and interpersonal (teamwork). |

## Learning, Teaching and Assessment Strategy

Lectures and examples classes. All module learning outcomes are assessed via group projects.

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.

Individual mark will be assigned based on peer review.

Supplementary assessment: Supplementary as original but to be done individually

| Mode of Assessment | | | |
|---|---|---|---|
| Type | Method | Description | Weighting |
| Summative | Coursework - Written | Group report Individual contribution 4000 words (+figures and tables) | 100% |
| Referral | Coursework - Written | Supplementary as original (but individual) | 100% |

## 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.*

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