UNIVERSITY of BRADFORD

Module Descriptor

Reaction Engineering

Module Code:	CPE5005-B
Academic Year:	2018-19
Credit Rating:	20
School:	(OUT OF USE FROM 2018/9) School of Engineering
Subject Area:	Chemical and Process Engineering
FHEQ Level:	FHEQ Level 5
Module Leader:	Dr Nejatollah Rahmanian

Additional Tutors:

Pre-requisites:

Co-requisites:

Contact Hours

Type	Hours
Lectures	48
Tutorials	38
Laboratory	9
Directed Study	103
Examinations DO NOT USE	2

Availability Periods

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

Module Aims

To deliver a comprehensive understanding of the methodology of linking chemical kinetics with material and energy conservation in the design of idealised homogeneous chemical reactors operating both in batch and continuous modes and under both isothermally and non-2 isothermally conditions and to train them. Moreover, knowledge and experience of

using standard numerical methods is practised in order to solve complex engineering problems.

Outline Syllabus

Chemical Kinetics: rate equations and reaction rate constant; activation energy, its determination and interpretation; Arrhenius law; reaction kinetics of complex heterogeneous reactions; consecutive and competing reactions and rate determining steps; catalysis.
Reactors: Modelling of basic reactor types; derivation of mass and energy equations for batch, tubular and continuous flow stirred tank reactors under isothermal and non-isothermal conditions; heterogeneous reactors including vapour phase catalytic reactors, reactors in series; transient operations of continuous stirred tank reactors; non-ideal flow behaviour; resident time distributions and their interactions with reaction kinetics; tracer response.

Module Learning Outcomes

On successful completion of this module, students will be able to...

1 Apply mass and energy balances to chemical reactions. Use chemical thermodynamics to define problems. Acquire kinetic data from literature and laboratory. Interpret such data.

2 Carry out simulations of chemical reactions to help in the design of more sustainable products; design, optimise and operate reactors safely.

3 Solve problems when chemical change is present. Present clear design procedures for a given reactor problem.

Learning, Teaching and Assessment Strategy

The module is delivered through a series of lectures, supported by appropriate case study material as necessary.
Lectures are supported with tutorial sessions, which promote teamwork, development of oral presentation and ICT skills, e-learning, peer feedback and self-learning.
Learning outcomes are assessed by formal examination and coursework.

Mode of Assessment

Type	Method	Description	Length	Weighting	Final Assess'
Summative	Examination - closed book	Examination - closed book	1.5 hours	70%	Yes
Summative	Coursework	Report on reactor design 1 written report	0 hours	30%	No

Legacy Code (if applicable)

ENG2313L

Reading List

To view Reading List, please go to **rebus:list**.