

Module Details	
Module Title:	Food and Pharmaceutical Process Engineering
Module Code:	CPE7004-B
Academic Year:	2019-20
Credit Rating:	20
School:	Department of Chemical Engineering
Subject Area:	Chemical and Process Engineering
FHEQ Level:	FHEQ Level 7 (Masters)
Pre-requisites:	
Co-requisites:	

Contact Hours	
Type	Hours
Independent Study	150
Lectures	34
Tutorials	12
Laboratory	4

Availability	
Occurrence	Location / Period
BDA	University of Bradford / Semester 2 (Feb - May)

Module Aims
Food and Pharmaceutical Process Engineering is a multidisciplinary module that introduces students with fundamental principles of mixing and crystallisation in process industry, the design of equipment for mixing (for both Newtonian and non-Newtonian fluids) and the design of equipment for food and pharmaceutical processing such as hot melt extruder, distillation, extraction, membrane separation and heat treatment units.

Outline Syllabus

1. Mixing in the Process Industry: Introduction
2. Mixing in Agitated Vessels: Circulation & Intensity of Circulation, Power Consumption, Mixing Time
3. Mixing in Agitated Vessels: Extension to real non Newtonian fluids.
4. Crystallisation and Crystallisers
5. Drying of pharmaceuticals
6. Size reduction and size enlargement in pharmaceutical industry
7. Size enlargement (dry, wet & melt granulation), extrusion spheronisation
8. Polymeric solid dispersions & hot melt extrusion
9. Powder technology and tableting
10. Processing Techniques in the Food Industry (e.g. Freezing, Drying, Moisture Control, Thermal, Membrane Separation).
11. Food Processing Units and Process Modelling using gPROMS (process modelling tools).
12. Design and operation optimisation of unit operations applied in food processes

Learning Outcomes

1	Specify quantitatively the characteristics of mixing, fluid flow, drying, filtration, crystallisation;
2	Develop critical understanding of different unit operations applied to food and pharmaceutical processes and develop problem solving skills.
3	Develop skills in the use of software in food process modelling, simulation and optimisation.

Learning, Teaching and Assessment Strategy

The topics are delivered through interactive lectures; group discussions; tutorials involving hand calculations; computer labs developing process models for unit operation used in food processing. Interactive sessions and group discussions are activated via directed learning on the topics. The computer lab sessions are interactive and are supported by the tutor and the students.

Coursework and Formal Examination.

Coursework: Work individually or in a group (a) to develop food process model and simulate using a modelling software gPROMS (b) to research and write a critical report on the design and operation optimisation of given food processing unit operation

Mode of Assessment

Type	Method	Description	Length	Weighting
Summative	Examination - closed book	Examination - closed book. Final Assessment	2 hours	75%
Summative	Coursework	Group/Individual Report 3000 words per student	-3000 words	25%

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.