

BS935-10 Biochemical Engineering - Bioreactor Engineering & Unit Operations

26/27

Department

Life Sciences

Level

Taught Postgraduate Level

Module leader

Guy Barker

Credit value

10

Module duration

2 weeks

Assessment

100% coursework

Study location

University of Warwick main campus, Coventry

Description

Introductory description

This module will introduce students to the range of fundamental operations used by process engineers, who perform chemical and biological reactions on a large scale and separate the raw products into finished materials suitable for the market place.

Module aims

The principle focus will be on biotechnological processes. The module will cover processing options for handling and separating compounds of interest. It aims to develop process engineering skills which will enable students to select the appropriate methods to make the required end product.

Outline syllabus

This is an indicative module outline only to give an indication of the sort of topics that may be

covered. Actual sessions held may differ.

Review of Process Engineering Unit Operations including:

Feedstock variability and how to deal with this; Fermentation and Bio-Reactors;

Extraction/Separation technologies - distillation/condensation; solvent extraction; crystallisation; drying/evaporation; mixing; solids separation and processing; Optimisation of performance;

Dealing with waste e.g. effluent treatment with emphasis on those systems used in bioprocessing.

This will be reinforced with field visits to processing sites and through invited speakers from Industry.

Learning outcomes

By the end of the module, students should be able to:

- Identify, review and select the key processing steps to convert raw materials into marketable end products.
- Demonstrate knowledge of different biotechnology reactor designs and analyse what influences the choice of different systems.
- Critically assess the choice of process options, including the difficulties experienced with scale up
- Interact effectively with Process Engineers on the conceptual design of process systems by oral, written or visual means
- Critically compare and debate alternative process options based on a critical assessment of the known data.

Indicative reading list

[Reading lists can be found in Talis](#)

[Specific reading list for the module](#)

Subject specific skills

Demonstrate knowledge of different biotechnology reactor designs and analyse what influences the choice of different systems.

Transferable skills

Critically compare and debate alternative process options based on a critical assessment of the known data.

Study

Study time

Type	Required
Lectures	14 sessions of 1 hour (14%)
Seminars	1 session of 4 hours (4%)
Demonstrations	1 session of 1 hour (1%)
Practical classes	(0%)
External visits	1 session of 4 hours (4%)
Private study	77 hours (77%)
Total	100 hours

Private study description

Independent and group research

Costs

No further costs have been identified for this module.

Assessment

You do not need to pass all assessment components to pass the module.

Assessment group A2

Assessment component	Weighting	Study time	Eligible for self-certification
Seminar Presentation	70%		No
To deliver an illustration of how the module content has been applied in a practical example as selected from a number of alternatives that have been preselected. These examples have been selected in order to provide sufficient content and to include the background on the relevant process and the impact of the technology used.			

Reassessment component is the same

Assessment component	Weighting	Study time	Eligible for self-certification
MCQ	30%		No
To answer 50 questions that have been set to determine the level of comprehension of the			

Weighting**Study time****Eligible for self-certification**

lectures given with the module.

Reassessment component is the same

Feedback on assessment

Generic oral feedback to cohort on MCQ and seminar assessments. Written individual feedback to each student on seminar assessments. Face-to-face feedback on any assessment provided on request from the student.

Availability**Courses**

This module is Core for:

- Year 1 of TBSS-C5N2 Postgraduate Taught Biotechnology, Bioprocessing and Business Management