



Module Details

Short Title:	Applied Biotechnology
Full Title:	Applied Biotechnology
Module Id:	3203

Official Code:	BIOT7001	NFQ Level:	7	ECTS Credits:	5
-----------------------	----------	-------------------	---	----------------------	---

Coordinator:	JAMES O MAHONY
---------------------	----------------

Description:	This module will introduce the learner to specialised topics of importance to the Biotechnology Industry, specifically relating to discovery, engineering and formulation of bio-molecules
---------------------	--

Learning Outcomes:

On successful completion of this module the learner will be able to...

1. Describe the principles of protein biosynthesis and list the relevant modifications associated with functional proteins
2. List the steps and tools required to generate a functional protein from a biotechnology based process
3. Provide an overview of protein engineering as a technique used to enhance bio-molecule production
4. Identify the principle and applications of High Throughput Screening in respect to drug discovery
5. Describe the structure, characteristics and applications of monoclonal antibodies, vaccines and hormones
6. Perform selected practical assignments and experiments relevant to the biotechnology industry

Pre-requisite learning**Module Recommendations**

This is prior learning (or a practical skill) that is strongly recommended before enrolment in this module. You may enrol in this module if you have not acquired the recommended learning but you will have considerable difficulty in passing (i.e. achieving the learning outcomes of) the module. While the prior learning is expressed as named CIT module(s) it also allows for learning (in another module or modules) which is equivalent to the learning specified in the named module(s).

No recommendations listed

Incompatible Modules

These are modules which have learning outcomes that are too similar to the learning outcomes of this module. You may not earn additional credit for the same learning and therefore you may not enrol in this module if you have successfully completed any modules in the incompatible list.

No incompatible modules listed

Module Requirements

This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed. You may not enrol on this module if you have not acquired the learning specified in this section.

No requirements listed



Module Content & Assessment

Indicative Content
• Protein Biosynthesis

A comprehensive description of the different stages of protein biosynthesis, the modifications encountered and the main cellular functions associated with active proteins

• Bio-molecule production

The upstream and downstream logistical considerations associated with biomolecule production, and the modern biotechnological tools required to maximise yield and purity

• Protein Engineering

An examination of the benefits and applications of protein engineering including historical developments, and specific examples of engineered products in production today

• High Throughput Screening

The logistics and multidisciplinary nature of high throughput screening employed for modern product and drug discovery applications

• Specific Examples

The impact of bio-molecules on selected sectors (food, medical, environmental), particularly in relation to enzymes and bio-therapeutics.

• Practical component

The students will learn strategic practical techniques and develop analytical and troubleshooting skills relevant to the biotechnology industry.

Assessment Breakdown	%
Course Work	100%
End of Semester Formal Examination	0%

Coursework Breakdown				
<i>Type</i>	<i>Description</i>	<i>Outcome addressed</i>	<i>% of total</i>	<i>Assessment Date</i>
Practical/Skills Evaluation	Laboratory experiments and report writing	2,3,4,5,6	80	Every Week
Short Answer Questions	n/a	1,2,4	20	Every Week

The institute reserves the right to alter the nature and timings of assessment


Module Workload & Resources

Workload		Full-time mode		
<i>Type</i>	<i>Description</i>	<i>Hours</i>	<i>Frequency</i>	<i>Average Weekly Learner Workload</i>
Lecture	class based instruction	2	Every Week	2.00
Lab	practical laboratory instruction	2	Every Week	2.00
Total Weekly Learner Workload				4.00
Total Weekly Contact Hours				4.00

Resources
Recommended Book Resources

- **Gary Walsh, *Proteins: Biochemistry & Biotechnology***
- **Ellyn Daugherty, *Biotechnology, Science for the new millenium***