Title:	Molecular Diagnostics APPROVED
Long Title:	Molecular Diagnostics

Module Code:	BIOT7007	**Duration:**	1 Semester

Credits:	5
NFQ Level:	Intermediate
Field of Study:	Biotechnology
Valid From:	Semester 1 - 2017/18 (September 2017)
Module Delivered in	1 programme(s)
Next Review Date:	September 2022
Module Coordinator:	Brigid Lucey
Module Author:	JIM O MAHONY
Module Description:	An Introduction to the principle and modern day applications of molecular diagnostics in a biotechnology based industry

Learning Outcomes	
On successful completion of this module the learner will be able to:	
LO1	List the key historical developments in the field of molecular diagnostics
LO2	Identify the role and importance of molecular diagnostics such as real-time PCR, modern spectroscopic methods, microfluidics, bio-imaging and sequencing technologies
LO3	Assess the benefit of research and development practices within a biotechnology company
LO4	Develop a capacity to troubleshoot and problem solve within the context of modern day biotechnology facility
LO5	Perform selected laboratory techniques, interpret results and prepare reports.

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).

620	BIOM6002	Introduction to Microbiology

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

Co-requisite Modules

No Co-requisite modules listed

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
Historical developments A chronological view of the main developments and breakthroughs in the field of molecular diagnostics including cell biology, DNA discovery, enzymes, bio-imaging and PCR
Molecular tools An overview of the enzymes, proteins and bio-markers within a cell which can be used, engineered and exploited for molecular diagnostics
Instrumentation A comprehensive evaluation of the technologies and instrumentation that has revolutionised the field of diagnostics including, miniturisation, fluoresence, digital devices and bio-computing
Applied molecular techniques A systematic analysis of specific techniques used in modern day molecular diagnostics including PCR, real-time PCR, genome sequencing, microarrays, genotyping strategies and bio-imaging
Case studies An overview of specific examples where molecular diagnostics have benefited or impacted on biotechnology or society in general.
Bio-ethics A description of the main challenges facing society as a consequence of developments in the field of molecular diagnostics such as stem cells, gene therapy and DNA databases

Assessment Breakdown	%
Course Work	100.00%

Course Work

Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Practical/Skills Evaluation	Weekly laboratory based practicals	5	50.0	Every Week
Short Answer Questions	relating to lecture materials	1,2,3,4	50.0	Week 10

No End of Module Formal Examination

Reassessment Requirement
Repeat examination *Reassessment of this module will consist of a repeat examination. It is possible that there will also be a requirement to be reassessed in a coursework element.*

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

Module Workload

Workload: Full Time				
Workload Type	*Workload Description*	*Hours*	*Frequency*	*Average Weekly Learner Workload*
Lecture	Theory based material	2.0	Every Week	2.00
Lab	laboratory based instruction	2.0	Every Week	2.00
Independent & Directed Learning (Non-contact)	No Description	3.0	Every Week	3.00
			Total Hours	7.00
			Total Weekly Learner Workload	7.00
			Total Weekly Contact Hours	4.00

This module has no Part Time workload.

Module Resources

Recommended Book Resources

- **Truant A.L 2016, *Commercial Methods in Clinical Microbiology*, 2 Ed., 3, 4 & 6, Wiley Blackwell [ISBN: 9781119021872]**

Supplementary Book Resources

- **Juluri R. Rao 2006, *Molecular Diagnostics - current technology and applications*, Horizon [ISBN: 1-904933-19-X]**

This module does not have any article/paper resources

Other Resources

- **n/a: *Scopus***
  http://www.scopus.com

Module Delivered in

Programme Code	Programme	Semester	Delivery
CR_SPHBI_8	Bachelor of Science (Honours) in Pharmaceutical Biotechnology	6	Mandatory