



Module Details

Short Title:	Molecular Diagnostics	APPROVED			
Full Title:	Molecular Diagnostics				
Module Code:	BIOT7007	NFQ Level:	Intermediate	ECTS Credits:	5.0
Valid From:	Semester 1 - 2011/12 (September 2011)				
Module Coordinator:	BRENDAN O CONNELL				
Module Author:	JIM O MAHONY				
Description:	An Introduction to the principle and modern day applications of molecular diagnostics in a biotechnology based industry				
Learning Outcomes:					
<i>On successful completion of this module the learner will be able to</i>					
<ol style="list-style-type: none"> 1. List the key historical developments in the field of molecular diagnostics 2. Identify the role and importance of molecular diagnostics such as real-time PCR, epidemiological genotyping, microfluidics, bio-imaging and sequencing technologies 3. Assess the benefit of research and development practices within a biotechnology company 4. Incorporate both in silico and lab based techniques as part of a combined molecular diagnostics strategy. 5. Perform selected laboratory techniques, interpret results and prepare reports. 					
Pre-requisite learning					
Module Recommendations					
<i>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).</i>					
7370	BIOM6002	Introduction to Microbiology			
7370	BIOM7001	Analytical Microbiology			
Incompatible Modules					
<i>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.</i>					
No incompatible modules listed					
Requirements					
<i>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.</i>					
No requirements listed					
Co-requisites					
No co-requisites 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, fluorescence, 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	100.0%
End of Semester Formal Examination	0%

Coursework Breakdown				
Type	Description	Outcome addressed	% of total	Assessment Date
Practical/Skills Evaluation	Weekly laboratory based practicals	None	40.0	Every Week
Other	Data Handling Exam	None	20.0	Week 6
Short Answer Questions	relating to lecture materials	None	40.0	Week 10

Reassessment Requirement
Repeat examination <i>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.</i>

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



Module Workload & Resources

Workload <i>Type</i>	Full-time <i>Description</i>	Full-time		
		<i>Hours</i>	<i>Frequency</i>	<i>Average Weekly Learner Workload</i>
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 Weekly Learner Workload				7.00
Total Weekly Contact Hours				4.00

Resources

Supplementary Book Resources

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