

APPROVED**BIOT6001: Introduction to Biotechnology****Module Details**

Module Code:	BIOT6001
Title:	Introduction to Biotechnology APPROVED
Long Title:	Introduction to Biotechnology
NFQ Level:	Fundamental
Valid From:	Semester 1 - 2017/18 (September 2017)
Duration:	1 Semester
Credits:	5
Field of Study:	4218 - Biotechnology
Module Delivered in:	13 programme(s)
Module Description:	This module introduces students to the fundamentals of Biotechnology and its applications.

Learning Outcomes	
<i>On successful completion of this module the learner will be able to:</i>	
#	Learning Outcome Description
LO1	Describe historic scientific developments and current applications of Biotechnology.
LO2	Describe the structure and function of DNA and protein and basic techniques used in their isolation and analysis.
LO3	Discuss the different cell types used in biotechnology and the essential requirements for small and large scale culture.
LO4	Explain the basic principles of genetic and protein engineering.
LO5	Outline the major classes of biopharmaceuticals and their therapeutic applications.
LO6	Perform relevant practical based experimental protocols, interpret results, and complete standard laboratory reports.
Dependencies	
Module Recommendations	
12841	BIOT6001 Introduction to Biotechnology
Incompatible Modules	
No incompatible modules listed	
Co-requisite Modules	
No Co-requisite modules listed	
Requirements	
None	

Indicative Content
Introduction An overview of some of the key historic developments in science that have contributed to Biotechnology and some of the modern applications that have resulted from these historic events.
DNA and Protein A description of the structure, function, importance and applications of DNA and protein. An introduction to fundamental techniques used to isolate and analyse protein and DNA.
Biological Cells An introduction to cell types, their storage and growth requirements for small and large scale cell culture.
Genetic and protein engineering An overview of the requirements, techniques and strategies employed in genetic and protein engineering.
Biopharmaceuticals An introduction to the diversity of biopharmaceuticals and their applications.
Practical component The students will learn the health and safety considerations of working in a biological laboratory. They will develop the practical competency to complete specific laboratory tasks, including aseptic technique, DNA isolation, cell growth and monitoring.

Module Content & Assessment	
Assessment Breakdown	%
Coursework	100.00%

Assessments

Coursework			
Assessment Type	Short Answer Questions	% of Total Mark	30
Timing	Week 6	Learning Outcomes	1,2
Assessment Description Theory assessment			
Assessment Type	Short Answer Questions	% of Total Mark	30
Timing	Sem End	Learning Outcomes	3,4,5
Assessment Description Theory Assessment			
Assessment Type	Practical/Skills Evaluation	% of Total Mark	20
Timing	Sem End	Learning Outcomes	6
Assessment Description Laboratory Examination			
Assessment Type	Practical/Skills Evaluation	% of Total Mark	20
Timing	Every Second Week	Learning Outcomes	6
Assessment Description Laboratory experiments & report writing			
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.

Module Workload**Workload: Full Time**

Workload Type	Contact Type	Workload Description	Frequency	Average Weekly Learner Workload	Hours
Lecture	Contact	Class based instruction	Every Week	2.00	2
Lab	Contact	Practical laboratory instruction	Every Second Week	2.00	4
Independent & Directed Learning (Non-contact)	Non Contact	Independent & directed learning	Every Week	3.00	3
Total Hours					9.00
Total Weekly Learner Workload					7.00
Total Weekly Contact Hours					4.00

This module has no Part Time workload.

Module Resources**Recommended Book Resources**

Renneberg, R., Berkling, V. & Loroch, V.. (2017), Biotechnology for Beginners, 2nd. Academic Press, [ISBN: 9780128012246].

Supplementary Book Resources

Daugherty, E.. (2017), Biotechnology: Science for the New Millennium, 2nd. EMC Paradigm Publishers, [ISBN: 9780763875961].

Reece, J.B., Taylor, M.R., Simon, E.J., Dickey, J.L. & Hogan, K.A.. (2017), Campbell Biology: Concepts & Connections, 9th. Pearson, [ISBN: 9780134296012].

This module does not have any article/paper resources

Other Resources

Website, Cells Alive,
<http://www.cellsalive.com>
 Website, Yourgenome,
<http://www.yourgenome.org>

Module Delivered in

Programme Code	Programme	Semester	Delivery
CR_SAGBI_8	Bachelor of Science (Honours) in Agri-Biosciences	-1	Mandatory
CR_SCHQA_8	Bachelor of Science (Honours) in Analytical Chemistry with Quality Assurance	-1	Mandatory
CR_SINEN_8	Bachelor of Science (Honours) in Instrument Engineering	-1	Elective
CR_SNHSC_8	Bachelor of Science (Honours) in Nutrition and Health Science	-1	Elective
CR_SPHBI_8	Bachelor of Science (Honours) in Pharmaceutical Biotechnology	-1	Mandatory
CR_SAGBI_7	Bachelor of Science in Agri-Biosciences	-1	Mandatory
CR_SCHEM_7	Bachelor of Science in Analytical and Pharmaceutical Chemistry	-1	Elective
CR_SBIBI_7	Bachelor of Science in Applied Biosciences and Biotechnology	-1	Mandatory
CR_SFSTE_7	Bachelor of Science in Food and Health Science	-1	Mandatory
CR_SCEBS_8	Common Entry Biological Sciences	-1	Mandatory
CR_SBIOS_6	Higher Certificate in Science in Applied Biosciences	-1	Mandatory
CR_SOMNI_8	Physical Sciences (Common Entry)	-1	Group Elective 2
CR_SOMNI_7	Physical Sciences (Common Entry)	-1	Group Elective 2