

Liverpool John Moores University

Title: Principles and Applications in Biotechnology
Status: Definitive
Code: **7008BTBMOL** (118314)
Version Start Date: 01-08-2012

Owning School/Faculty: Pharmacy & Biomolecular Sciences
Teaching School/Faculty: Pharmacy & Biomolecular Sciences

Team	Leader
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Academic Level: FHEQ7 **Credit Value:** 30.00 **Total Delivered Hours:** 60.00

Total Learning Hours: 300 **Private Study:** 240

Delivery Options

Course typically offered: Standard Year Long

Component	Contact Hours
Lecture	39.000
Tutorial	14.000
Workshop	5.000

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	ASS1		40.0	2.00
Report	ASS2		20.0	
Presentation	ASS3		40.0	

Aims

To provide students with a platform for gaining an advanced understanding of the

principles of techniques and their applications, currently employed in the field of biotechnology.

To allow students to develop and demonstrate their ability to conduct independent research and present information on specific principles and applications of biotechnology using a range of presentation medium.

To enable the students to gain valuable transferable skills including; team work, time management skills and organisation skills.

Learning Outcomes

After completing the module the student should be able to:

- 1 Display a comprehensive understanding of the principles of a range of techniques employed in the field of biotechnology
- 2 Critically review the applications of techniques used in biotechnology in an industrial and resesarch setting
- 3 Demonstrate self direction and teamwork in implementing tasks
- 4 Communicate information clearly to specialist and non-specialist audiences

Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

Essay Style Questions	1	2	4
Protein Report	1	2	4
Group Exercise/Presentation	1	3	4

Outline Syllabus

This module will cover aspects of the following techniques:

Cell Technology - Cell culture, cell separation techniques, use of cells in biotechnology

Molecular Biology - Electrophoresis, PCR, Protein purification/separation, Sequencing, microarray technology

*Analytical Techniques - Chromatography, Mass Spectrometry, X-ray crystallography
Imaging Technology - Scanning probe microscopy, Electron microspy, fluorescence microscopy*

*Information Technology - Bioinformatics, Rasmol (molecular visualization software),
Basic Web Page construction (adobe dreamweaver)*

Learning Activities

Material will be delivered through lectures, tutorials and workshops. The lectures will

be designed to introduce the students to the basic principles of specific techniques currently used in the field of biotechnology. Lectures will also cover the specific applications of these techniques in biotechnology. This module will link with other modules which will provide more detail on the biological aspects of the certain technologies particularly at the molecular level.

Workshops will be provided to help students develop specific IT skills in basic web design which will be used to present their coursework. The coursework will run over the year and will involve the students presenting a biotechnological process for a learning aid or a visual protocol. This will be a group-based project and thus allow students to develop their transferable skills alongside their academic skills. At the end of the year the students will present their work visually using the IT skills they have developed.

Tutorials will run throughout the module to provide students with support on developing their knowledge in 'principles and applications in biotechnology' and for providing support with the coursework highlighted above.

References

Course Material	Book
Author	Ratledge, C
Publishing Year	2006
Title	Basic Biotechnology
Subtitle	
Edition	3rd
Publisher	Cambridge University Press
ISBN	0521840317

Course Material	Book
Author	Kreuzer, H
Publishing Year	2008
Title	Molecular Biology and Biotechnology
Subtitle	a guide for students
Edition	
Publisher	ASM Press
ISBN	9788126132683

Course Material	Book
Author	Gilbert, P.R
Publishing Year	2008
Title	Introduction to biotechnology
Subtitle	
Edition	
Publisher	Anmol Publications
ISBN	978812632683

Course Material	Book
Author	Braga, P.C. and Ricci, D
Publishing Year	2003
Title	Atomic Force Microscopy
Subtitle	Biomedical Methods and Applications
Edition	
Publisher	Humana ; Oxford : Blackwell
ISBN	1588290948

Course Material	Book
Author	Hibbs, A.R
Publishing Year	2004
Title	Confocal microscopy for biologists
Subtitle	
Edition	
Publisher	New York : Kluwer Academic
ISBN	0306484684

Course Material	Book
Author	Allen, T.D
Publishing Year	2008
Title	Introduction to electron microscopy for biologists
Subtitle	
Edition	
Publisher	Amsterdam ; London : Elsevier/Academic
ISBN	9780123743206

Course Material	Book
Author	Castillo, L
Publishing Year	2008
Title	Animal Cell Technology
Subtitle	From biopharmaceuticals to gene therapy
Edition	
Publisher	Taylor and Francis, New York
ISBN	9780415423045

Course Material	Book
Author	Thieman, W.J
Publishing Year	2013
Title	Introduction to Biotechnology
Subtitle	
Edition	3rd
Publisher	Pearson, Boston
ISBN	0321766113

Course Material	Book
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Author	Braga, P.C
Publishing Year	2011
Title	Atomic Force Microscopy in Biomedical Research
Subtitle	methods and Protocols
Edition	
Publisher	Humana, London, New York
ISBN	1617791040

Notes

This module will provide students with an understanding of some of the cutting edge techniques and their applications currently used in the field of biotechnology. This module will link to topics covered in other modules on the programme and will focus on five major areas namely, cell technology, molecular techniques, analytical techniques, imaging technology and information technology. All lectures will be covered by experts in their respective fields who will introduce the basic principles of the techniques and how these techniques are employed throughout biotechnology, both in an industrial and academic setting. Students will be expected to advance their knowledge of the topics covered in lectures throughout the programme by independent research.