



## UNIVERSITI TEKNOLOGI MARA

### BMS424: MICROBIAL MOLECULAR GENETICS

<b>Course Name (English)</b>	MICROBIAL MOLECULAR GENETICS <b>APPROVED</b>
<b>Course Code</b>	BMS424
<b>MQF Credit</b>	3
<b>Course Description</b>	This course introduces students to the basic molecular features in a prokaryotic system. It illustrates how these molecular features underlie DNA replication, transcription, gene recombination and translation of proteins. How genes are being expressed and manipulated will also be discussed.
<b>Transferable Skills</b>	1. learn the DNA replication, transcription, gene recombination and translation of proteins in prokaryotic system 2. learn how gene is being expressed and manipulated.
<b>Teaching Methodologies</b>	Lectures, Blended Learning, Demonstrations, Practical Classes, Discussion
<b>CLO</b>	CLO1 Explain the structure and organization of nucleic acids, as well as the processes of DNA replication, protein synthesis and gene transfer in microorganism. CLO2 Illustrate the mechanisms for regulation of gene expression in a prokaryotic system. CLO3 Display laboratory practical skills in following experimental procedures for microbial genetics.
<b>Pre-Requisite Courses</b>	No course recommendations
<b>Topics</b>	
<b>1. Organisation, Structure and Function of Genetic Material</b> 1.1) 1.1 Chromosomes 1.2) 1.2 Nucleic acids 1.3) 1.3 Extrachromosomal genetic elements e.g. plasmid, transposon	
<b>2. DNA Replication</b> 2.1) 2.1 Principles of DNA replication 2.2) 2.2 DNA Polymerases: structure and function	
<b>3. Transcription</b> 3.1) 3.1 Structure and function of mRNA 3.2) 3.2 Stages of transcription	
<b>4. Translation</b> 4.1) 4.1 Ribosome structure and functions 4.2) 4.2 tRNA and genetic code 4.3) 4.3 Stages of translation	
<b>5. Recombination</b> 5.1) 5.1 Horizontal gene transfer 5.2) 5.2 Conjugation 5.3) 5.3 Transformation 5.4) 5.4 Transduction	
<b>6. Regulation of gene expression</b> 6.1) 6.1 Overview of gene expression 6.2) 6.2 Types of regulation	
<b>7. Applications of Recombinant DNA Technology</b> 7.1) 7.1 Human genetic disease mutations 7.2) 7.3) 7.2 Commercial products in biotechnology	



Assessment Breakdown	%
Continuous Assessment	50.00%
Final Assessment	50.00%

Details of Continuous Assessment	Assessment Type	Assessment Description	% of Total Mark	CLO
	Assignment	Assignment	20%	CLO2
	Practical	Lab report	10%	CLO3
	Test	Test	20%	CLO1

Reading List	Recommended Text	<ul style="list-style-type: none"> <li>Snyder, L. and Champness, W. 2012, <i>Molecular Genetics of Bacteria American Society Mic Series</i>, 2nd Ed., 1,2,3, ASM Press New York [ISBN: 1111]</li> <li>Robert Brooker 2014, <i>Genetics: Analysis and Principles</i>, 5th Ed., McGraw-Hill Education [ISBN: 9780073525341]</li> <li>Leland Hartwell, Michael L. Goldberg, Janice A. Fischer, Leroy Hood, Charles F. Aquadro 2016, <i>Genetics from genes to genomes</i>, McGraw Hill [ISBN: 9789814738729]</li> </ul>
	Reference Book Resources	<ul style="list-style-type: none"> <li>Peter Russel 2013, <i>iGenetics: A molecular Approach</i>, Pearson Publishing Company</li> <li>Daniel L. Hartl 2012, <i>Essential Genetics: a genomics perspective</i>, 6th Ed., Jones &amp; Bartlett Publishers [ISBN: 9781449686888]</li> </ul>
Article/Paper List	This Course does not have any article/paper resources	
Other References	This Course does not have any other resources	