

### Short Form Unit Details

Unit Title	Molecular Biology
Level	5
Reference No. ( <i>showing level</i> )	
Credit Value	15 CAT points
Student Study Hours	Contact hours: 45 Student managed learning hours: 105
Pre-requisite learning	None
Co-requisites	None
Excluded combinations	
Unit co-ordinator	Dr. J. Acord
Faculty/Department	Applied Science
Short Description	This unit studies in detail the central dogma of molecular biology including DNA replication, transcription and translation in both prokaryotes and eukaryotes, the molecular biology of microbial genetics, recombinant DNA technology and gene regulation.
Aims	<p>To provide students with a broad understanding of the topics which constitute the recognized 'core' of molecular biological knowledge.</p> <p>To provide the intellectual framework whereby the student develops the ability to execute his/her own experiments, to analyze experimental data, to draw qualitative and quantitative conclusions from available data and to discern whether such conclusions are justified.</p> <p>To provide students with an appropriate range of transferrable skills.</p>
Learning Outcomes	<p>By the end of this unit students will be able to:</p> <p><b>Knowledge and Understanding:</b> Develop, at the level presented in standard undergraduate textbooks, knowledge and understanding of the major areas of molecular biology, namely: structure of nucleic acids, plasmids, microbial genetics, prokaryotic transcription and its control, DNA replication, mutagenesis and DNA repair, protein synthesis and the application of recombinant DNA techniques.</p> <p><b>Intellectual Skills:</b> Have the ability to integrate knowledge and understanding of numerous diverse processes into a comprehensive understanding of the interrelationships between them and their bearing on a complete system.</p> <p><b>Practical Skills:</b> Basic laboratory skills from level 1 reinforced. New skills more</p>

	<p>specifically relating to the means by which molecular processes can be easily studied will be developed. Ability to produce a coherent and succinct practical report enhanced. A range of methodologies will be presented in both lectures and the practical classes in order to encourage an understanding of the experimental basis of molecular biology.</p> <p><b>Transferable Skills:</b> Embarked on a continuing programme of acquisition of transferrable skills namely: numeracy, presentation skills, teamwork, individual study skills, time management and word processing skills.</p>
Employability	Employability is enhanced by the key transferable skills imparted by the practical component. An understanding of the basics of the central dogma of molecular biology is crucial across the whole of biology and underpins the burgeoning biotechnology sector.
Teaching and learning pattern	The unit comprises 3 hours of formal lectures per week. There is also an associated week-long practical class.
Indicative content	<p><b>Nucleic acids;</b> the structure and biochemical properties of DNA and histones.</p> <p><b>Central dogma of molecular biology;</b> DNA replication, PCR, transcription, translation, RNA splicing.</p> <p><b>DNA repair;</b> mutagenesis and repair, the restriction/modification system in prokaryotes.</p> <p><b>Control of gene expression;</b> The <i>lac</i> and <i>trp</i> operons.</p> <p><b>Recombinant DNA technology;</b> plasmids, cloning, DNA libraries and screening.</p>
Assessment <i>Elements &amp; weightings</i>	<p>The pass mark for the unit is 40%.</p> <p>40% of the marks will be derived from practical classes associated with the course and the remaining 60% of the mark will be derived from an assessment at the end of the course.</p>
Indicative Sources <i>(Reading lists)</i>	<p><b>Core Texts:</b></p> <p>Watson, J. D. <i>Et al</i> (2008) <i>Molecular Biology of the Gene</i>. 6<sup>th</sup> Edition. Pearson.</p> <p>Alberts, B., <i>Et al</i> (2007) <i>Molecular Biology of the Cell</i>. 5<sup>th</sup> Edition. Garland Science.</p> <p><b>Optional Material:</b></p>

	<p>Dale, J. W. &amp; Park S. F. (2004) <i>Molecular Genetics of Bacteria</i>. 4<sup>th</sup> Edition. Wiley.</p> <p>Nelson, D. L. &amp; Cox, M. M. (2009) <i>Lehninger Principles of Biochemistry</i>. 5<sup>th</sup> Edition. W. H. Freeman.</p> <p>Weaver, R. F. (2007) <i>Molecular Biology</i>. 4<sup>th</sup> Edition. McGraw-Hill.</p> <p>Reed, R. <i>Et al</i> (2007) <i>Practical Skills in Biomolecular Sciences</i>. 3<sup>rd</sup> Edition. Benjamin Cummings.</p>
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