



**CORPORATE AND ACADEMIC SERVICES**

**MODULE SPECIFICATION**

Part 1: Basic Data					
Module Title	Scientific Basis of Life				
Module Code	USSJT5-30-1	Level	1	Version	1
Owning Faculty	Health and Applied Sciences	Field	Department of Biological Biomedical and Analytical Sciences		
Contributes towards	FdSc Healthcare Science				
UWE Credit Rating	30	ECTS Credit Rating	15	Module Type	Standard
Pre-requisites	None		Co- requisites	None	
Excluded Combinations	None		Module Entry requirements	N/A	
Valid From	September 2013		Valid to	September 2019	

<b>CAP Approval Date</b>	21 <sup>st</sup> November 2012
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Part 2: Learning and Teaching	
Learning Outcomes	<p>On successful completion of this module students will be able to:</p> <ul style="list-style-type: none"> <li>• compare the ultrastructure and function of prokaryotic and eukaryotic cells and their organelles [A1, B1]</li> <li>• describe the structure of biological membranes and explain key concepts in membrane transport [A1]</li> <li>• describe the key features and properties of nucleic acids, amino acids, proteins, lipids and carbohydrates [A1]</li> <li>• describe key pathways in carbohydrate, lipid and amino acid metabolism and explain how energy from metabolism is channelled into ATP synthesis [A1]</li> <li>• relate DNA &amp; RNA structure to function and describe the basic features of gene structure and expression [A1]</li> <li>• explain how genetic material can be altered by natural and artificial means [A1, B2]</li> <li>• describe the modes of inheritance of characteristics [A1, B1]</li> <li>• demonstrate key skills of data analysis in cell biology, genetics and biochemistry [B1]</li> <li>• discuss current applications and impact of cell biology, genetics and biochemistry [A1, B2]</li> <li>• reflect on how the scientific principles of cell biology, biochemistry and genetics underpin practice in healthcare science [B2]</li> </ul>

Syllabus Outline	<ul style="list-style-type: none"> <li>• Biological chemistry: the properties and structures of biochemical building blocks and macromolecules. Acids and bases, simple buffer systems.</li> <li>• Structure and function of eukaryotic cells and their organelles. Membrane structure and transport across membranes via diffusion, carrier proteins, channels, active transport.</li> <li>• Key techniques in Cell Biology and Biochemistry. Light microscopy, confocal microscopy, the transmission electron microscope (TEM), the scanning electron microscope (SEM). Fractionation of cells and their contents, simple protein purification, separation and assay.</li> <li>• Introduction to metabolism. An overview of catabolic and anabolic pathways. The metabolic roles of ATP, NADH, NADPH and FADH<sub>2</sub>. Electron transport and ATP synthesis. The major pathways of carbohydrate, lipid and amino acid metabolism and their significance in health and disease. Enzymes as biological catalysts.. Determination and significance of K<sub>m</sub> and V<sub>max</sub>, specific activity.</li> <li>• Studying genes. Genetics in context - genes, expectations and realities. The genetic material and genomes. DNA photocopying - the replication of DNA. Decoding the messages within the genes - gene expression: transcription, RNA processing and translation. Altering the genetic material - mutation, recombination, gene cloning and PCR.</li> <li>• Inheriting genes. What Mendel discovered and how molecular genetics relates to Mendel. Variation upon a Mendelian theme. The phenomenon of linkage - mapping genes. Gene inheritance patterns in humans and molecular approaches to diagnosing genetic disease.</li> </ul>
Contact Hours	<ul style="list-style-type: none"> <li>• Work based training: pro rata allocation of the 16 hours per week for the programme</li> <li>• There will be 4 weeks of contact time at UWE proposed to be presented in 3 x 1 week blocks with an induction week included. Included in these weeks are practical classes, lectures and tutorials as well as a poster presentation/defence.</li> <li>• In addition to the allocated hours on campus learning, students will engage for 1.5hrs per week set aside in the workplace for distance learning through a combination of lectures, guided reading synchronous tutorials, synchronous and asynchronous discussions, online quizzes, and assignments</li> </ul>
Teaching and Learning Methods	<p><b>Scheduled learning:</b> During block periods at UWE, lectures, seminars, tutorials, and practical classes will be delivered. In addition scheduled learning also includes synchronous online, collaborative group work which may be timetabled on a weekly basis and participation in asynchronous online activities</p> <p><b>Independent learning:</b> Using defined TEL strategies includes hours engaged with essential reading, case study preparation, assignment preparation and completion etc.</p> <p><b>Work based learning:</b> Students will learn subject specific content during work based learning</p>
Key Information Sets Information	<p>Key Information Sets (KIS) are produced at programme level for all programmes that this module contributes to, which is a requirement set by HESA/HEFCE. KIS are comparable sets of standardised information about undergraduate courses allowing prospective students to compare and contrast between programmes they are interested in applying for.</p>

**Key Information Set - Module data**

Number of credits for this module

30

Hours to be allocated	Scheduled learning and teaching study hours	Independent study hours	Workbased study hours	Allocated Hours
300	50	100	150	300



The table below indicates as a percentage the total assessment of the module which constitutes a -

**Written Exam:** Unseen written exam, open book written exam, In-class test

**Coursework:** Written assignment or essay, report, dissertation, portfolio, project

**Practical Exam:** Oral Assessment and/or presentation, practical skills assessment, practical exam

Please note that this is the total of various types of assessment and will not necessarily reflect the component and module weightings in the Assessment section of this module description:

Total assessment of the module:	
Written exam assessment percentage	40%
Coursework assessment percentage	60%
Practical exam assessment percentage	0%
	100%

**Reading Strategy**

All students will be encouraged to make full use of the print and electronic resources available to them through membership of the University. These include a range of electronic journals and a wide variety of resources available through web sites and information gateways. The University Library's web pages provide access to subject relevant resources and services, and to the library catalogue. Many resources can be accessed remotely. Students will be presented with opportunities within the curriculum to develop their information retrieval and evaluation skills in order to identify such resources effectively.

Any **essential reading** will be indicated clearly, along with the method for accessing it, e.g. students may be expected to purchase a set text, be given or sold a print study pack or be referred to texts that are available electronically, etc. This guidance will be available either in the module handbook, via the module information on Blackboard or through any other vehicle deemed appropriate by the module/programme leaders.

If **further reading** is expected, this will be indicated clearly. If specific texts are listed, a clear indication will be given regarding how to access them and, if appropriate, students will be given guidance on how to identify relevant sources for themselves, e.g. through use of bibliographical databases.

The generic assessment criteria used in the Department of Applied Sciences, and made available to students, will be used for all assessments.

**Indicative Reading List**

It is recommended that the following book be purchased by all students as it covers most of the module material at an appropriate level.  
The latest edition of Alberts, B. et al., Essential Cell Biology, Garland Science

	<p>Extensive notes will be provided via blackboard on the scientific topics. Links to useful and credible websites will also be provided.</p> <p>The students are also advised to consult the basic scientific texts in Frenchay and Glenside libraries, of which the following is a representative sample:</p> <p>The latest editions of:          Russell P.J., Genetics. iGenetics A Molecular Approach, Pearson Ed. Inc. USA          Robinson TR., Genetics for Dummies. Wiley USA          Lodish, H. et al., Molecular Cell Biology, W.H. Freeman and Company          Alberts, B. et al., Molecular Biology of the Cell, Garland Science          Nelson, D.L. and Cox, M.M., Principles of Biochemistry, WH Freeman          Berg, J.M., Tymoczko, J.L. and Stryer, L., Biochemistry, WH Freeman</p>
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<b>Part 3: Assessment</b>	
Assessment Strategy	<p>A written examination is an effective vehicle for assessing knowledge and understanding of many aspects of this material. Regular online tests will provide opportunities for formative assessment and feedback.</p> <p>The first coursework element will provide an opportunity for students to consolidate factual knowledge through data interpretation in Cell Biology, Biochemistry and Genetics. The second element allows students to apply their knowledge and identify examples of how the principles of Cell Biology, Biochemistry and Genetics underpin practice in Healthcare Science through preparation and defence of a poster.</p>

Identify final assessment component and element		
% weighting between components A and B (Standard modules only)	<b>A:</b> <b>40</b>	<b>B:</b> <b>60</b>
<b>First Sit</b>		
<b>Component A</b> (controlled conditions) <b>Description of each element</b>	<b>Element weighting</b>	
1. Examination (2 hours) assessment period 2	100	
<b>Component B</b> <b>Description of each element</b>	<b>Element weighting</b>	
1. CW1 Data interpretation exercise	50	
2. CW2 Poster presentation and defence	50	

<b>Resit (further attendance at taught classes is not required)</b>	
<b>Component A</b> (controlled conditions) <b>Description of each element</b>	<b>Element weighting</b>
1. Examination (2 hours)	100
<b>Component B</b> <b>Description of each element</b>	<b>Element weighting</b>
1. CW3 Data interpretation exercise	50
2. CW4 Case study	50
If a student is permitted an <b>EXCEPTIONAL RETAKE</b> of the module the assessment will be that indicated	

by the Module Description at the time that retake commences.