



**CORPORATE AND ACADEMIC SERVICES**

**MODULE SPECIFICATION**

Part 1: Basic Data					
Module Title	Cell Biochemistry and Genetics				
Module Code	USSKA4-30-1	Level	1	Version	
Owning Faculty	Health and Applied Sciences	Field	BBAS		
Contributes towards	BSc Healthcare Sciences; BSc Biomedical Sciences				
UWE Credit Rating	30	ECTS Credit Rating	15	Module Type	Standard
Pre-requisites	none		Co- requisites		
Excluded Combinations	USSK64-30-1 Cell Biochemistry and Genetics (Premedical Sciences); USSJRU-30-1 Human Biological Systems?		Module Entry requirements		
Valid From	September 2014		Valid to	September 2020	

<b>CAP Approval Date</b>	28/03/2014
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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>describe the ultrastructure and function of eukaryotic cells, organelles and biological membranes [A1, B2]</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 and lipid 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, B1]</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, B2]</li> <li>discuss current applications and impact of cell biology, genetics and biochemistry [A1, B1]</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>. Enzymes as biological catalysts. Electron transport and ATP synthesis. The major pathways of carbohydrate and lipid metabolism and their significance in health and disease.</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	<p>The contact hours (72) are distributed as follows:</p> <ul style="list-style-type: none"> <li>• 24 hours lectures</li> <li>• 12 hours tutorials</li> <li>• 36 hours practicals and data analysis sessions</li> </ul>
Teaching and Learning Methods	<p><b>Scheduled learning</b></p> <ul style="list-style-type: none"> <li>• The module will be delivered as mix of lectures and integrated tutorial sessions together with a series of related practical and data interpretation session.</li> <li>• Revision will be embedded in the lectures and in an additional tutorial session.</li> </ul> <p><b>Independent learning</b> includes hours engaged with essential reading, assignment preparation and completion etc. Assignment B2 is designed to provide experience of short answer and multiple choice questions. Formative online quizzes will also be provided to support learning of key concepts from the lectures and practical classes.</p> <p>These sessions constitute an average time per level as indicated in the table below.</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</p>

interested in applying for.

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	Placement study hours	Allocated Hours
300	72	228	0	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.

Indicative Reading List

The following book is recommended as it covers most of the module material at an appropriate level.

Alberts, B. Bray, D. Hopkin, K. Johnson, A.D. Lewis, J. Raff, M. Roberts, K. and Walter, P. (2013) *Essential Cell Biology*, London: Garland Science.

Extensive notes will be provided via blackboard on the scientific topics. Links to useful and credible websites will also be provided.

	<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: The latest editions of: Russell, P.J., <i>Genetics. iGenetics A Molecular Approach</i>, USA: Pearson Ed. Inc. Robinson, T.R., <i>Genetics for Dummies</i>. USA: Wiley. Lodish, H. et al., <i>Molecular Cell Biology</i>, New York: W.H. Freeman and Company Alberts, B. et al., <i>Molecular Biology of the Cell</i>, London: Garland Science Nelson, D.L. and Cox, M.M., <i>Principles of Biochemistry</i>, New York: W.H. Freeman Berg, J.M., Tymoczko, J.L. and Stryer, L., <i>Biochemistry</i>, New York: W.H. Freeman</p>
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<b>Part 3: Assessment</b>	
<b>Assessment Strategy</b>	<p>The Assessment for this module is designed to test the breadth and depth of students' knowledge, as well as their ability to analyse data and relate subject knowledge to current applications and impact.</p> <p>The controlled component is a written exam. The exam will be 2 hours duration which is consistent with the Department's assessment strategy for Level 1 modules.</p> <p>The case study provides the opportunity for the student to analyse genetic information related to the taught material from lectures and practical classes. The second assignment will provide experience in interpreting and presenting biochemical data as well as practise in multiple-choice questions.</p> <p>Opportunities for formative assessment and feedback are built into the assignments and review of past exam papers.</p> <p>All work is marked in line with the Department's Generic Assessment Criteria and conforms to the university policies for the setting, collection, marking and return of student work. Assessments are described in the Module handbook that is supplied at the start of module.</p>

Identify final assessment component and element		
% weighting between components A and B (Standard modules only)	<b>A:</b>	<b>B:</b>
	<b>40</b>	<b>60</b>
<b>First Sit</b>		
<b>Component A</b> (controlled conditions) <b>Description of each element</b>	<b>Element weighting</b> <b>(as % of component)</b>	
1. Written examination ( 3 hours)	100	
<b>Component B</b> <b>Description of each element</b>	<b>Element weighting</b> <b>(as % of component)</b>	
1. Genetics Case study	50	
2. Biochemical Data Interpretation exercise	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> <b>(as % of component)</b>	
1. Written examination ( 3 hours)	100	
<b>Component B</b> <b>Description of each element</b>	<b>Element weighting</b> <b>(as % of component)</b>	

1. Genetics Case study	50
2. Biochemical Data Interpretation exercise	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.	