



CORPORATE AND ACADEMIC SERVICES

MODULE SPECIFICATION

Part 1: Basic Data					
Module Title	Molecular Biology for Medicine (Premedical Sciences)				
Module Code	USSJYP-15-1	Level	1	Version	1
Owning Faculty	Health and Applied Sciences	Field	Applied Sciences		
Contributes towards	Premedical Sciences Cert. HE (C99H)				
UWE Credit Rating	15	ECTS Credit Rating		Module Type	Standard
Pre-requisites	None		Co- requisites	None	
Excluded Combinations	None		Module Entry requirements	N/A	
Valid From	September 2014		Valid to	September 2020	

CAP Approval Date	28/03/2014
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Part 2: Learning and Teaching	
Learning Outcomes	<p>Learning Outcomes</p> <p>On successful completion of this module students will be able to:</p> <ul style="list-style-type: none"> • Relate DNA and RNA structure and topology to function and understand gene organisation and expression in both eukaryotes and prokaryotes. (A1, B2) • Explain how genes can be mutated and how this can result in genetically linked medical conditions. (A1, B2) • Describe and understand the molecular biology inherent to DNA replication, RNA transcription and translation and how this is regulated in both eukaryotes and prokaryotes. (A1, B2) • Describe and understand the process of RNA interference and how this can be applied to counter genetically linked medical conditions. (A1, B2) • Describe and understand the use of recombinant DNA technology in the medical field and in the production of transgenic organisms. (A1, B2) • Understand the basics of functional genomics, transcriptomics and proteomics technologies and describe how these have been applied in the diagnosis and understanding of genetically linked medical conditions. (A1, B2) • Describe the use of gene therapy. (A1, B1, B2) • Describe and understand the molecular biology underpinning cell cycle regulation with regard to the understanding and treatment of cancer and the process of cell death. (A1, B2) <p>All learning outcomes will be assessed under the module components and elements</p>

	therein as indicated.
Syllabus Outline	<ul style="list-style-type: none"> Studying genes and relating genetics to molecular biology. Molecular genetics in a medical context. The genetic material and genomes. The human genome project. Decoding the messages within genes. DNA replication. Gene expression - transcription, RNA processing/editing and translation. Altering genes – mutation and chromosome recombination. Application of modern molecular biology to understanding genetically linked medical conditions. Functional 'omics approaches in the diagnosis and understanding of genetically linked medical conditions and associated bioinformatics. Use of RNAi and gene therapy as treatments. Cancer, cell death and treatment approaches in an oncology setting.
Contact Hours	<ul style="list-style-type: none"> Students undertaking this 15 credit module can expect 36h of scheduled learning contact time with teaching staff, spread over one semester of the academic year. This contact time will occur during lectures (24h), case study tutorials (9h) and during timetabled in class assessments (3h) in the form of MCQ tests.
Teaching and Learning Methods	<p>Theoretical material within the module will be presented to the students in the form of weekly lectures throughout one of the semesters in the academic year. The learning of lecture content will be reinforced through time spent in independent learning by the directed reading of recommended texts and through the use of technology enhanced learning resources that will be provided online.</p> <p>The tutorials sessions will be used to engage the students in an extended molecular biology orientated case study relevant to medicine and forming assessment component B1. This module furthers the knowledge of students in molecular biology and genetics above and beyond that taught in other modules within the programme with the purpose of both enhancing and complementing their learning in this area with a specific focus within the medical field. The aim of this case study is then to bring together a number of aspects of applied molecular biology and data handling within the context of the broader programme teaching.</p> <p>Tutorial sessions will also be used to further engage students in the development of their learning, analytical and revision skills and to provide opportunities for the interactive development of skills required for the work place.</p> <p>Students undertaking this module can expect to receive 24h of lectures spread over the 12 weeks of teaching of one semester and would be expected to spend at least another 3h per week in independent learning while undertaking directed reading in relation to each of the lectures. In addition to the lectures the students will undertake 9h in total of tutorial sessions in the semester and fortnightly 30min in class assessments that comprise online MCQs.</p> <p>The remainder of the independent learning time allocated to the module should be spent preparing written assessments for submission and undertaking revision for both continuous assessment sessions and for the final exams (EX1).</p> <p>Scheduled learning includes lectures, tutorials and in class assessment periods.</p> <p>Independent learning includes hours engaged with essential reading, case study assignment preparation and completion, exam revision <i>etc.</i></p>
Key Information	Key Information Sets (KIS) are produced at programme level for all programmes that

Sets Information

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.

Key Information Set - Module data				
Number of credits for this module				15
Hours to be allocated	Scheduled learning and teaching study hours	Independent study hours	Placement study hours	Allocated Hours
150	36	114	0	150

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

Written Exam: Unseen written exam

Coursework: Written assignment or essay, report, in class MCQ tests

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:

Written exam assessment percentage	40%
Coursework assessment percentage	60%
	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

Latest editions of:

Reading List	<p>Core Text Books:</p> <p>Russell, P.J. <i>Genetics. iGenetics A Molecular Approach</i>, USA: Pearson Education.</p> <p>Alberts, B. Johnson, A. Lewis, J. Raff, M. Roberts, K. & Walter, P. <i>Molecular Biology of the Cell</i>. Abingdon: Garland Science.</p> <p>General Texts:</p> <p>Clark, D.P. & Russell, L.D. <i>Molecular Biology Made Simple and Fun</i>. St. Louis, MO, USA: Cache River Press/Quick Publishing.</p> <p>Robinson, T.R. <i>Genetics for Dummies</i>. USA: Wiley</p> <p>Supplementary Reading for Interest:</p> <p>Collins, F.S. (2010) <i>The Language of Life: DNA and the Revolution in Personalized Medicine</i>. New York: Harper Collins Publishing.</p> <p>Watson, J.D. & Berry, A. (2004) <i>DNA: The secret of life</i>. USA: Knopf Doubleday Publishing Group.</p> <p>Craig V. J. (2008) <i>A Life Decoded</i>. London: Penguin.</p> <p>Jones, S. (2012) <i>The Language of the Genes (revised Ed)</i>. UK: Flamingo.</p>
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Part 3: Assessment	
Assessment Strategy	<p>Summative assessment for this module will be provided using a number of approaches. The nature of the premedical sciences programme to which this module contributes requires continuous and final assessment of student learning and a measure of their acquisition of written presentation skills of analysed data.</p> <p>Continuous assessment within component B2 will be provided by the use of frequent multiple choice question tests throughout the module and following blocks of learning provided in the form of lectures. These tests will be provided online in Blackboard, be marked automatically and the results provided to the module leader via the grade centre. Feedback at this level will also be provided online and will be by review of the tests after they have been completed and will include the correct answers and the rationale behind these.</p> <p>The ability of the students to write scientifically and analyse data will be assessed under component B1 in the form of a 1500 word case study report. This will be marked and feedback provided in the form of written comments.</p> <p>The tutorials within the module offer the students opportunities to undertake formative assessment in a group environment and further individual formative assessment in the form of online quizzes will also be available. Feedback on formative assessment in tutorials will be given verbally while that for such learning performed online will be part of the design of the quiz.</p> <p>Final assessment under component A will take the form of an examination that comprises compulsory short answer questions.</p>

Identify final assessment component and element	
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		A:	B:
% weighting between components A and B (Standard modules only)		40	60
First Sit			
Component A (controlled conditions) Description of each element		Element weighting (as % of component)	
1. EX1 Examination Exam Period 2 (1.5 hours) FINAL ASSESSMENT		100%	
Component B Description of each element		Element weighting (as % of component)	
1. CW1 Case Study report		50%	
2. CW2 Frequent MCQ in class tests		50%	
Resit (further attendance at taught classes is not required)			
Component A (controlled conditions) Description of each element		Element weighting (as % of component)	
1. EX3 Examination Exam Period 3 (1.5 hours) FINAL ASSESSMENT		100%	
Component B Description of each element		Element weighting (as % of component)	
1. CW3 Essay based report		100%	
If a student is permitted an EXCEPTIONAL RETAKE of the module the assessment will be that indicated by the Module Description at the time that retake commences.			