



MODULE SPECIFICATION

Part 1: Information			
Module Title	Molecular Genetics		
Module Code	USSKB7-15-2	Level	Level 5
For implementation from	2020-21		
UWE Credit Rating	15	ECTS Credit Rating	7.5
Faculty	Faculty of Health & Applied Sciences	Field	Applied Sciences
Department	HAS Dept of Applied Sciences		
Module type:	Standard		
Pre-requisites	Cells, Biochemistry and Genetics 2020-21, Human Biological Systems 2020-21		
Excluded Combinations	None		
Co- requisites	None		
Module Entry requirements	None		

Part 2: Description
<p>Overview: Pre-requisites: students must have Cell Biochemistry and Genetics (USSKA4-30-1) OR Human Biological Systems (USSJRU-30-1).</p> <p>Educational Aims: See Learning Outcomes</p> <p>Outline Syllabus: Gene expression and its regulation: DNA packaging and structure of chromatin Effects of modification of DNA and of histones Epigenetic control of gene expression Basal and regulated transcription; structure and function of transcription factors Co-transcriptional and posttranscriptional steps in gene regulation; structure and function of RNA binding proteins Alternative splicing, RNA editing, RNA export Regulation of mRNA translation, localization and stability Function of microRNAs and other non-coding RNAs</p> <p>Genome structure and function: Introduction to genomics with a focus on the mapping and sequencing of genomes, assembling and annotating genomes; genome analysis; the human genome – structure and ethical legal and social implications of understanding it</p>

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Functional genomics; using sequence similarity to assign function
Assigning gene function experimentally

Genetics and disease; population genetics:

Causes of genetic variation; genotoxicity

Introduction to DNA repair; Mendelian and chromosomal basis of inheritance; introduction to chromosomal aberrations

Genetic structure of populations; Hardy Weinberg Law; selection; genetic variation

SNPs and other polymorphisms and their association with disease

DNA profiling and the use of DNA in forensic analysis

Teaching and Learning Methods: The module will be delivered as mainly as lectures with some practical classes, tutorial sessions and revisions sessions.

Scheduled learning

Scheduled contact time is structured around a series of lectures that introduce the key concepts of the topic under discussion.

Practical classes will allow students to develop their laboratory skills and to consolidate key concepts using classical genetics experiments

Tutorial sessions will include discussions on essay writing/creating essay plans, data interpretation.

Revision session will be based around writing targeted essay plans based on past papers, towards the end of the module.

Independent learning includes hours engaged with essential reading, case study preparation, assignment preparation and completion etc.

These sessions constitute an average time per level as indicated in the table below.

The module will be supported by Blackboard.

The contact hours (33) are distributed as follows:

15 hours lectures

10 hours of practical classes

5 hours tutorial sessions

3 hours of revision sessions

Part 3: Assessment

The Assessment for this module is designed to test the breadth and depth of students' knowledge, as well as their ability to analyse, synthesize and summarise information critically, including published research and data from the 'grey' literature.

Component A is an online exam with a 24 hour submission window, which provides students with the opportunity to demonstrate their knowledge and understanding of the key concepts and paradigms associated with the subject matter, to use examples and other evidence critically to support their arguments.

The coursework provides the opportunity for the student to complete an in-depth analysis of selected topic from the module syllabus by engaging in a practical exercise and critically reviewing published research.

Opportunities for formative assessment and feedback are built into the assignment and review of past exam papers.

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.

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First Sit Components	Final Assessment	Element weighting	Description
Written Assignment - Component B		50 %	Laboratory practical write-up (1500 words)
Examination (Online) - Component A	✓	50 %	Online Exam (24 hours)
Resit Components	Final Assessment	Element weighting	Description
Written Assignment - Component B		50 %	Laboratory practical write-up (1500 words)
Examination (Online) - Component A	✓	50 %	Online Exam (24 hours)

Part 4: Teaching and Learning Methods																	
Learning Outcomes	<p>On successful completion of this module students will achieve the following learning outcomes:</p> <table border="1"> <thead> <tr> <th>Module Learning Outcomes</th> <th>Reference</th> </tr> </thead> <tbody> <tr> <td>Understand and discuss the general principles underlying genome structure and function in a range of organisms, with a focus on the human genome</td> <td>MO1</td> </tr> <tr> <td>Discuss functional and comparative genomics using experimental models</td> <td>MO2</td> </tr> <tr> <td>Understand the fundamentals of molecular evolution and the basis of population genetics and DNA profiling</td> <td>MO3</td> </tr> <tr> <td>Discuss genetic polymorphisms, SNPs, the genetic basis of disease, and gene therapy</td> <td>MO4</td> </tr> <tr> <td>Discuss the several ways in which gene expression can be regulated in development and how it goes astray in disease</td> <td>MO5</td> </tr> <tr> <td>Find and use up-to-date literature</td> <td>MO6</td> </tr> <tr> <td>Communicate elements of molecular genetics in written format</td> <td>MO7</td> </tr> </tbody> </table>	Module Learning Outcomes	Reference	Understand and discuss the general principles underlying genome structure and function in a range of organisms, with a focus on the human genome	MO1	Discuss functional and comparative genomics using experimental models	MO2	Understand the fundamentals of molecular evolution and the basis of population genetics and DNA profiling	MO3	Discuss genetic polymorphisms, SNPs, the genetic basis of disease, and gene therapy	MO4	Discuss the several ways in which gene expression can be regulated in development and how it goes astray in disease	MO5	Find and use up-to-date literature	MO6	Communicate elements of molecular genetics in written format	MO7
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Reading List	<p><i>The reading list for this module can be accessed via the following link:</i></p> <p>https://uwe.rl.talis.com/modules/usskb7-15-2.html</p>
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Part 5: Contributes Towards

This module contributes towards the following programmes of study:

Healthcare Science (Genetic Science) {Foundation} [Sep][FT][Frenchay][4yrs] BSc (Hons) 2018-19
Healthcare Science (Blood Science) {Foundation} [Sep][FT][Frenchay][4yrs] BSc (Hons) 2018-19
Healthcare Science (Tissue Science) {Foundation} [Sep][FT][Frenchay][4yrs] BSc (Hons) 2018-19
Biomedical Science {Foundation} [Sep][FT][Frenchay][4yrs] BSc (Hons) 2018-19
Biomedical Science {Foundation} [Sep][SW][Frenchay][5yrs] BSc (Hons) 2018-19
Biomedical Science {Foundation} [Sep][FT][Frenchay][5yrs] MSci 2018-19
Biomedical Science {Foundation} [Sep][SW][Frenchay][6yrs] MSci 2018-19
Forensic Science {Foundation} [Sep][FT][Frenchay][5yrs] MSci 2018-19
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