University of the West of England
BRISTOL

ACADEMIC SERVICES
MODULE SPECIFICATION

Part 1: Basic Data						
Module Title	Molecular Genetics					
Module Code	USSKB7-15-2		Level	2	Version	1
Owning Faculty	Health and Applied Sciences		Field	Department of Biological, Biomedical and Analytical Sciences		
Contributes towards	BSc (Hons) Biomedical Sciences (Clinical) Block Release Route) BSc (Hons) Biomedical Sciences (including Clinical) BSc (Hons) Healthcare Science (Life Sciences) BSc (Hons) Forensic Science FdSc Forensic Science					
UWE Credit Rating	15	ECTS Credit Rating	7.5	Module Type	Standard	
Pre-requisites	Cell Biochemistry and Genetics (USSKA4-30-1) OR Human Biological Systems (USSJRU-30-1) OR Biology and Mathematics for Forensic Science (USSKC4-30-1)		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

Part 2: Learning and Teaching	
Learning Outcomes	On successful completion of this module students will be able to: • understand and discuss the general principles underlying genome structure and function in a range of organisms, with a focus on the human genome (assessed in Component A); • discuss functional and comparative genomics using experimental models, • understand the fundamentals of molecular evolution and the basis of population genetics and DNA fingerprinting (assessed in Component A); • discuss genetic polymorphisms, SNPs, the genetic basis of disease, and gene therapy approaches (assessed in component A &B) • discuss the several ways in which gene expression can be regulated in terms of chromatin structure, transcription, co- and post-transcriptional processes • understand how the regulation of gene expression underpins development and how it goes astray in disease (assessed in Component A); • find and use up-to-date literature (assessed in Component A and B); • communicate elements of molecular genetics in written format (assessed in Component A and B);

Syllabus Outline	Genome structure and function; • DNA structure and replication; introduction to DNA repair; Mendelian and chromosomal basis of inheritance; introduction to chromosomal aberrations • Introduction to genomics with a focus on the mapping and sequencing of genomes, assembling and annotating genomes; genome analysis considering bacterial, archaeal and eukaryotic genomes; the human genome – its structure in detail, including a brief reference to the ethical legal and social implications of understanding it Functional and comparative genetics • Functional genomics, using sequence similarity to assign function • Assigning gene function experimentally Genetics and disease; population genetics • Genetic structure of populations; Hardy Weinberg Law; Selection; genetic variation • SNPs and other polymorphisms and their association with disease • DNA fingerprinting and the use of DNA in forensic analysis Regulation of gene expression • Structure and modification of chromatin • Basal and regulated transcription; structure and function of transcription factors • Co-transcriptional and posttranscriptional steps in gene regulation; structure and function of DNA and RNA binding proteins • Alternative splicing; RNA editing; RNA export • Regulation of mRNA translation, localization and stability • Unction of microRNAs and other non-coding RNAs
Contact Hours	The contact hours (36) are distributed as follows: • 24 hours lectures • 6 hours of practical classes • 5 hours tutorial sessions • 1 hour f revision session
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. • The 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.
Key Information Sets Information	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.

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, 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	50%
Coursework assessment percentage	50%
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 list is offered to provide validation panels/accrediting bodies with an indication of the type and level of information students may be expected to consult. As such, its currency may wane during the life span of the module specification. However, as indicated above, CURRENT advice on readings will be available via other more frequently updated mechanisms.* Books: The most recent edition of: •Ladomery, M. R. *Molecular Biology of RNA*. Oxford: Oxford University Press. •Armstrong, L. *Epigenetics*. New York: Garland Science. •Russell, P.J. *iGenetics*, Harlow: Pearson. •Krebs, J.E., Goldstein, E.S., Kilpatrick, S.T. *Lewin's Genes XI*. Burlington, MA:Jones & Bartlett. •Lodish, H. et al, *Molecular Cell Biology*. Basingstoke: Macmillan Higher Education. •Latchman, D.S. *Gene Control*, London: Garland Science •Plus appropriate use of relevant primary and review journals and www based resources. These will include the leading journals in this field; *Trends in*… series of journals *Current Opinion*… series of journals *Frontiers in*… series of journals *Nature* *Nature Reviews* *PLoS* etc.

Part 3: Assessment	
Assessment Strategy	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. The controlled component is a written exam. The exam will be 3 hours duration which is consistent with the Department's assessment strategy for Level 2 modules. The examination 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.

Identify final assessment component and element	**Component A (exam)**	
% weighting between components A and B (Standard modules only)	**A:** **50%**	**B**: **50%**
First Sit		
Component A (controlled conditions) **Description of each element**	**Element weighting** **(as % of component)**	
1. Exam (3 hours)	100	
Component B **Description of each element**	**Element weighting** **(as % of component)**	
1. Case Study Coursework	100	

Resit (further attendance at taught classes is not required)	
Component A (controlled conditions) **Description of each element**	**Element weighting** **(as % of component)**
1. Exam (3 hours)	100
Component B **Description of each element**	**Element weighting** **(as % of component)**
1. Case Study Coursework	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.	