



Module Descriptor

Title	Genetics		
Session	2024/25	Status	
Code	BIOL08012	SCQF Level	8
Credit Points	20	ECTS (European Credit Transfer Scheme)	10
School	Health and Life Sciences		
Module Co-ordinator	Farah Jaber		

Summary of Module

Genetics is one of the most exciting and rapidly developing areas of science. This module introduces you to both classical genetics and molecular biology. Molecular biology is the study of biology at a molecular level. You will discover the interactions between DNA, RNA and protein biosynthesis and learn how these interactions are regulated. This is the basis of developments such as cloning, gene editing, vaccine development and the creation of transgenic animals. This is combined with classical genetics which studies why and how offspring resemble their parents. An understanding of mechanisms and patterns of inheritance leads to a greater understanding of genetic disorders such as cystic fibrosis and muscular dystrophy. If scientists can understand the disorder they can develop new tests for these diseases and potential cures. In addition to gaining theoretical knowledge you will perform laboratory experiments to test the theories.

Undertaking this module will develop a range of graduate attributes. Valuable experience in practical work, recording, analysing and interpreting results will develop critical thinking skills. Basic knowledge of Genetics will be extended and ambition developed by consideration of current cutting edge developments such as gene editing. Working as a group to produce a poster on current technologies will enhance communication, collaboration and creativity.

Module Delivery Method	On-Campus ¹	Hybrid ²	Online ³	Work -Based Learning ⁴
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

¹ Where contact hours are synchronous/ live and take place fully on campus. Campus-based learning is focused on providing an interactive learning experience supported by a range of digitally-enabled asynchronous learning opportunities including learning materials, resources, and opportunities provided via the virtual learning environment. On-campus contact hours will be clearly articulated to students.

² The module includes a combination of synchronous/ live on-campus and online learning events. These will be supported by a range of digitally-enabled asynchronous learning opportunities including learning materials, resources, and opportunities provided via the virtual learning environment. On-campus and online contact hours will be clearly articulated to students.

³ Where all learning is solely delivered by web-based or internet-based technologies and the participants can engage in all learning activities through these means. All required contact hours will be clearly articulated to students.

⁴ Learning activities where the main location for the learning experience is in the workplace. All required contact hours, whether online or on campus, will be clearly articulated to students

Campuses for Module Delivery	<input type="checkbox"/> Ayr	<input checked="" type="checkbox"/> Lanarkshire	<input type="checkbox"/> Online / Distance Learning
	<input type="checkbox"/> Dumfries	<input type="checkbox"/> London	<input type="checkbox"/> Other (specify)
Terms for Module Delivery	Term 1 <input type="checkbox"/>	Term 2 <input checked="" type="checkbox"/>	Term 3 <input type="checkbox"/>
Long-thin Delivery over more than one Term	Term 1 – Term 2 <input type="checkbox"/>	Term 2 – Term 3 <input type="checkbox"/>	Term 3 – Term 1 <input type="checkbox"/>

Learning Outcomes	
L1	Describe the structure and properties of nucleic acids.
L2	Outline the processes of biosynthesis of nucleic acids and gene expression.
L3	Analyse the mechanisms and patterns of inheritance in higher organisms.
L4	Demonstrate practical skills in performing molecular techniques relevant to genetics and recording, analysing and interpreting results.
L5	

Employability Skills and Personal Development Planning (PDP) Skills	
SCQF Headings	During completion of this module, there will be an opportunity to achieve core skills in:
Knowledge and Understanding (K and U)	<p>Please select SCQF Level</p> <p>8</p> <p>Demonstrate a broad knowledge of core molecular genetics (central dogma). Understand the core theories of inheritance with limited application.</p>
Practice: Applied Knowledge and Understanding	<p>Please select SCQF Level</p> <p>8</p> <p>Use the theoretical knowledge gained to perform experiments and interpret the results.</p>
Generic Cognitive skills	<p>Please select SCQF Level</p> <p>8</p> <p>Use a range of approaches to formulate appropriate responses to problems in mendelian and molecular genetics.</p>
Communication, ICT and Numeracy Skills	<p>Please select SCQF Level</p> <p>8</p> <p>Communicate effectively orally and in writing. Analyse and interpret data where appropriate.</p>
Autonomy, Accountability and Working with Others	<p>Please select SCQF Level</p> <p>8</p> <p>Working in teams to perform practical work will require time management, organisational skills and awareness of professional practice.</p>

Prerequisites	Module Code BIOL07023 BIOL07022	Module Title Fundamentals of Life Chemistry for Biosciences
	Other	
Co-requisites	Module Code	Module Title

Learning and Teaching	
<p>In line with current learning and teaching principles, a 20-credit module includes 200 learning hours, normally including a minimum of 36 contact hours and maximum of 48 contact hours.</p> <p>This module will be delivered using a face-to-face approach to learning and teaching, unless otherwise stated. Delivery will be supported by a range of material on the VLE. Methods will include lectures, videos, tutorials focused on problem solving and application of theoretical knowledge and practical laboratory work. The material in this module will develop concepts introduced in level 7. The laws and concepts of inheritance will be introduced and applied in problem solving. This will reinforce basic concepts and encourage a deeper learning approach. Concepts in molecular genetics will be further developed from level 7 by looking at replication, transcription, translation and their control in more detail. Relevance to DNA technology applications will be highlighted appropriately to maintain relevance to current developments. Practicals skills in molecular techniques will be developed in the laboratory and data from practical experiments will be analysed and presented appropriately.</p>	
Learning Activities	Student Learning Hours
During completion of this module, the learning activities undertaken to achieve the module learning outcomes are stated below:	(Note: Learning hours include both contact hours and hours spent on other learning activities)
Lecture / Core Content Delivery	20
Tutorial / Synchronous Support Activity	8
Laboratory / Practical Demonstration / Workshop	12
Asynchronous Class Activity	8
Independent Study	148
Please select	
TOTAL	200

Indicative Resources
<p>The following materials form essential underpinning for the module content and ultimately for the learning outcomes:</p> <p>Web site http://www.dnalc.org/ Dolan DNA Learning Centre, Cold Spring Harbor Laboratory particularly DNA from the Beginning is an excellent site on the background molecular Biology.</p> <p>Hartl, D.L. (2018)Essential Genetics and Genomics (7th ed; Jones and Bartlett)</p> <p>Hartl, D.L. & Cochrane, B. (2017)Genetics Analysis of Genes and Genomes(9th ed; Jones & Bartlett)</p>

Snustad, D.P. & Simmons, M.J. (2016) Principles of Genetics (7th ed.Wiley)

UWS Library lists: <https://uws-uk.leganto.exlibrisgroup.com/leganto/readinglist/lists/11462322860003931>

(N.B. Although reading lists should include current publications, students are advised (particularly for material marked with an asterisk*) to wait until the start of session for confirmation of the most up-to-date material)

Attendance and Engagement Requirements

In line with the [Student Attendance and Engagement Procedure](#), Students are academically engaged if they are regularly attending and participating in timetabled on-campus and online teaching sessions, asynchronous online learning activities, course-related learning resources, and complete assessments and submit these on time.

For the purposes of this module, academic engagement equates to the following:

Attendance on-campus for all sessions unless otherwise stated.

Equality and Diversity

The University's Equality, Diversity and Human Rights Procedure can be accessed at the following link: [UWS Equality, Diversity and Human Rights Code](#).

(N.B. Every effort will be made by the University to accommodate any equality and diversity issues brought to the attention of the School)

Supplemental Information

Divisional Programme Board	Biological Sciences Health
Overall Assessment Results	<input type="checkbox"/> Pass / Fail <input checked="" type="checkbox"/> Graded
Module Eligible for Compensation	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If this module is eligible for compensation, there may be cases where compensation is not permitted due to programme accreditation requirements. Please check the associated programme specification for details.
School Assessment Board	HLS
Moderator	G. McGarvie
External Examiner	A. Tsaousis
Accreditation Details	This module is part of the BSc (Hons) Biomedical Science programme; accredited by Institute of Biomedical Science (IBMS) and approved by Health & Care Professions Council (HCPC) as part of BSc (Hons) Applied Biomedical Science programme. This module is part of the BSc (Hons) Applied Bioscience, BSc (Hons) Applied Bioscience with Forensic Investigation and BSc (Hons) Applied Bioscience and Zoology programmes; accredited by Royal Society of Biology (RSB)

Module Appears in CPD catalogue	<input type="checkbox"/> Yes <input type="checkbox"/> No
Changes / Version Number	

Assessment (also refer to Assessment Outcomes Grids below)
Assessment 1
Two class tests, worth 50% of the final mark.
Assessment 2
Lab Reports and group poster based on the practical work worth 50% of the final mark.
Assessment 3
Observation of practical skills in molecular techniques. This is a Pass/Fail component which must be passed.
(N.B. (i) Assessment Outcomes Grids for the module (one for each component) can be found below which clearly demonstrate how the learning outcomes of the module will be assessed. (ii) An indicative schedule listing approximate times within the academic calendar when assessment is likely to feature will be provided within the Student Module Handbook.)

Component 1							
Assessment Type	LO1	LO2	LO3	LO4	LO5	Weighting of Assessment Element (%)	Timetabled Contact Hours
Class test (written)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	50	2

Component 2							
Assessment Type	LO1	LO2	LO3	LO4	LO5	Weighting of Assessment Element (%)	Timetabled Contact Hours
Report of practical/ field/ clinical work and Demonstrations/ Poster presentations/ Exhibitions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	50	0

Component 3							
Assessment Type	LO1	LO2	LO3	LO4	LO5	Weighting of Assessment Element (%)	Timetabled Contact Hours
Clinical/ Fieldwork/ Practical skills assessment/ Debate/ Interview/ Viva voce/ Oral	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	0	0
Combined total for all components						100%	2 hours

Change Control

What	When	Who
Module delivery: from Hybrid C to On-campus Attendance and engagement requirements: The statement was changed to the following: "Attendance on-campus for all sessions unless otherwise stated. "		F. Jaber
Learning & Teaching: First sentence changed from "hybrid approach" to "This module will be delivered using a face-to-face approach to learning and teaching, unless otherwise stated"		F. Jaber
Student learning hours: Independent study changed from 152 to 148 hours. Core content delivery changed from 12 to 20 hours, Tutorials from 12 to 8 hours and Asynchronous class activity from 12 to 8 hours.		F. Jaber
Indicative resources: "UWS Library lists: https://uws-uk.leganto.exlibrisgroup.com/leganto/readinglist/lists/11462322860003931 " was added		F. Jaber