

Session: 2023/24

Last modified: 09/02/2024

Title of Module: Genetics			
Code: BIOL08012	SCQF Level: 8 (Scottish Credit and Qualifications Framework)	Credit Points: 20	ECTS: 10 (European Credit Transfer Scheme)
School:	School of Health and Life Sciences		
Module Co-ordinator:	Farah Jaber		
Summary of Module			
<p>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.</p> <p>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.</p>			

Module Delivery Method					
Face-To-Face	Blended	Fully Online	HybridC	HybridO	Work-based Learning
			✓		
<p>Face-To-Face Term used to describe the traditional classroom environment where the students and the lecturer meet synchronously in the same room for the whole provision.</p> <p>Blended A mode of delivery of a module or a programme that involves online and face-to-face delivery of learning, teaching and assessment activities, student support and feedback. A programme may be considered "blended" if it includes a combination of face-to-face, online and blended modules. If an online programme has any compulsory face-to-face and campus elements it must be described as blended with clearly articulated delivery information to manage student expectations</p> <p>Fully Online Instruction that is solely delivered by web-based or internet-based technologies. This term is used to describe the previously used terms distance learning and e learning.</p> <p>HybridC Online with mandatory face-to-face learning on Campus</p> <p>HybridO Online with optional face-to-face learning on Campus</p> <p>Work-based Learning Learning activities where the main location for the learning experience is in the workplace.</p>					

Campus(es) for Module Delivery						
The module will normally be offered on the following campuses / or by Distance/Online Learning: (Provided viable student numbers permit)						
Paisley:	Ayr:	Dumfries:	Lanarkshire:	London:	Distance/Online Learning:	Other:
			✓			
Term(s) for Module Delivery						
(Provided viable student numbers permit).						
Term 1		Term 2	✓	Term 3		

Learning Outcomes: (maximum of 5 statements)		
On successful completion of this module the student will be able to: 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.		
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)	SCQF Level 8. Demonstrate a broad knowledge of core molecular genetics (central dogma). Understand the core theories of inheritance with limited application.	
Practice: Applied Knowledge and Understanding	SCQF Level 8. Use the theoretical knowledge gained to perform experiments and interpret the results.	
Generic Cognitive skills	SCQF Level 8. Use a range of approaches to formulate appropriate responses to problems in mendelian and molecular genetics.	
Communication, ICT and Numeracy Skills	SCQF Level 8. Communicate effectively orally and in writing. Analyse and interpret data where appropriate.	
Autonomy, Accountability and Working with others	SCQF Level 8. Working in teams to perform practical work will require time management, organisational skills and awareness of professional practice.	
Pre-requisites:	Before undertaking this module the student should have undertaken the following:	
	<table border="1"> <tr> <td>Module Code: BIOL07023 BIOL07022</td> <td>Module Title: Fundamentals of Life Chemistry for Biosciences</td> </tr> </table>	Module Code: BIOL07023 BIOL07022
Module Code: BIOL07023 BIOL07022	Module Title: Fundamentals of Life Chemistry for Biosciences	

	Other:	or equivalent
Co-requisites	Module Code:	Module Title:

* Indicates that module descriptor is not published.

Learning and Teaching	
<p>This module will be delivered using a hybrid approach to learning and teaching. Face to face 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. Practical skills in molecular techniques will be developed in the laboratory and data from practical experiments will be analysed and presented appropriately.</p>	
<p>Learning Activities During completion of this module, the learning activities undertaken to achieve the module learning outcomes are stated below:</p>	<p>Student Learning Hours (Normally totalling 200 hours): (Note: Learning hours include both contact hours and hours spent on other learning activities)</p>
Lecture/Core Content Delivery	12
Tutorial/Synchronous Support Activity	12
Laboratory/Practical Demonstration/Workshop	12
Asynchronous Class Activity	12
Independent Study	152
	200 Hours Total
**Indicative Resources: (eg. Core text, journals, internet access)	
<p>The following materials form essential underpinning for the module content and ultimately for the learning outcomes: There are several books available in the library and resources on the internet. The following are examples:</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> <p>Snustad, D.P. & Simmons, M.J. (2016) Principles of Genetics (7th ed.Wiley)</p> <p>https://openstax.org/books/biology-ap-courses</p>	

(**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)

Engagement Requirements

In line with the Academic Engagement Procedure, Students are defined as academically engaged if they are regularly engaged with timetabled teaching sessions, course-related learning resources including those in the Library and on the relevant learning platform, and complete assessments and submit these on time. Please refer to the Academic Engagement Procedure at the following link: [Academic engagement procedure](#)

Where a module has Professional, Statutory or Regulatory Body requirements these will be listed here:

Attendance at synchronous sessions (lectures, workshops, lab practicals and tutorials, completion of asynchronous activities, and submission of assessments to meet the learning outcomes of the module. This module has a practical element as part of the Royal Society of Biology accreditation which must be attended.

Supplemental Information

Programme Board	Biological Sciences and Health
Assessment Results (Pass/Fail)	No
Subject Panel	Biology L7-11
Moderator	Gail 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)
Version Number	2.17

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Assessment: (also refer to Assessment Outcomes Grids below)

Two class tests, worth 50% of the final mark.

Lab Reports and group poster based on the practical work worth 50% of the final mark.

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 Handbook.)

Assessment Outcome Grids (Footnote A.)

Component 1							
Assessment Type (Footnote B.)	Learning Outcome (1)	Learning Outcome (2)	Learning Outcome (3)	Learning Outcome (4)	Weighting (%) of Assessment Element	Timetabled Contact Hours	
Class test (written)	✓	✓	✓		50	2	
Component 2							
Assessment Type (Footnote B.)	Learning Outcome (1)	Learning Outcome (2)	Learning Outcome (3)	Learning Outcome (4)	Weighting (%) of Assessment Element	Timetabled Contact Hours	
Report of practical/ field/ clinical work				✓	40	0	
Demonstrations/ Poster presentations/ Exhibitions				✓	10	0	
Component 3							
Assessment Type (Footnote B.)	Learning Outcome (1)	Learning Outcome (2)	Learning Outcome (3)	Learning Outcome (4)	Weighting (%) of Assessment Element	Timetabled Contact Hours	
Clinical/ Fieldwork/ Practical skills assessment/ Debate/ Interview/ Viva voce/ Oral				✓	0	0	
Combined Total For All Components					100%	2 hours	

Footnotes

- A. Referred to within Assessment Section above
 B. Identified in the Learning Outcome Section above

Note(s):

1. More than one assessment method can be used to assess individual learning outcomes.
2. Schools are responsible for determining student contact hours. Please refer to University Policy on contact hours (extract contained within section 10 of the Module Descriptor guidance note). This will normally be variable across Schools, dependent on Programmes &/or Professional requirements.

Equality and Diversity

In line with current legislation (Equality Act, 2010) and the UWS Equality, Diversity, and Human Rights Code, our modules are accessible and inclusive, with reasonable adjustment for different needs where appropriate. Module materials comply with University guidance on inclusive learning and teaching, and specialist assistive equipment, support provision and adjustment to assessment practice will be made in accordance with UWS policy and regulations. Where modules require practical and/or laboratory based learning or assessment required to meet accrediting body requirements the University will make reasonable adjustment such as adjustable height benches or assistance of a 'buddy' or helper.

[UWS Equality and Diversity Policy](#)

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