Module Descriptor

Title	DNA Technology		
Session	2025/26	**Status**	Published
Code	BIOL10009	**SCQF Level**	10
Credit Points	20	**ECTS (European Credit Transfer Scheme)**	10
School	**Health and Life Sciences**		
Module Co-ordinator	Jamie Whitelaw		

Summary of Module

Gene editing, stem cells, recombinant vaccines, PCR are terms that have been in the media recently. There has been rapid advancements in the development of techniques used to manipulate DNA. These techniques have been applied to areas such as medical diagnosis, treatment and prognosis, forensic analysis and the biotechnology industry. The improved technology has also led to the emergence of genetic engineering. Genetic engineering brings about change by scientifically altering an organism's genetic code. This has been applied not only to basic research but to advance fields such as medical diagnosis and treatment and creation of genetically modified plants and animals. Despite obvious benefits to society there has been public fear and criticism of the application of this technology which needs to be taken into account. This module will further your knowledge of genome structure, organisation and control of gene expression in normal and disease states. Provide an understanding of current DNA technologies and their applied to improving health, agriculture and society.

Undertaking this module will develop a range of graduate attributes. Knowledge in the principles behind the techniques used to manipulate DNA will be reviewed and extended to current and future applications of the technology. Sourcing, reviewing and presenting current scientific literature will develop critical thinking and presentation skills. The module will discuss new research developing innovation, research thinking and consideration of ethical issues.

Module Delivery Method	**On-Campus[1]**	**Hybrid[2]**	**Online[3]**	**Work -Based Learning[4]**

[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.

	☒		☐		☐	☐
Campuses for Module Delivery	☐ Ayr ☐ Dumfries		☒ Lanarkshire ☐ London ☐ Paisley		☐ Online / Distance Learning ☐ Other (specify)	
Terms for Module Delivery	Term 1	☐	Term 2	☒	Term 3	☐
Long-thin Delivery over more than one Term	Term 1 – Term 2	☐	Term 2 – Term 3	☐	Term 3 – Term 1	☐

Learning Outcomes	
L1	Explain in detail the principles, methodology and applications of DNA manipulation
L2	Evaluate the benefits and limitations of genetic engineering on society
L3	Explain using appropriate detailed examples the genetics of disease
L4	Critically evaluate current research in DNA Technology and its applications
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)	**SCQF 10** Demonstrate a critical understanding of the principles, theories and concepts of DNA technology. Demonstrate a knowledge and understanding of the application of DNA Technology including the benefits and limitations.
Practice: Applied Knowledge and Understanding	**SCQF 10** Use the theoretical knowledge gained to perform appropriate techniques and analyse the results in the context of the theory.
Generic Cognitive skills	**SCQF 10** Critically analyse the potential and limitations of DNA Technology. Critically evaluate current research in the area of DNA Technology.
Communication, ICT and Numeracy Skills	**SCQF 10** Communicate effectively orally and in writing to your peers.
Autonomy, Accountability and Working with Others	**SCQF 10** Working in teams to perform practical work and to research and present information will require time management, organisational skills and an understanding of professional practice.

[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

Prerequisites	Module Code	Module Title
	Other	
Co-requisites	Module Code	Module Title

Learning and Teaching	
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. Core theory and concepts will be delivered using face to face or recorded lectures, tutorials and discussions. Students will be expected to select, evaluate and discuss relevant scientific literature on a variety of applications of DNA technology. Case studies will be used to evaluate the benefits, limitations and ethics of applications such as gene editing and stem cell therapy.	
Learning Activities During completion of this module, the learning activities undertaken to achieve the module learning outcomes are stated below:	**Student Learning Hours** (Note: Learning hours include both contact hours and hours spent on other learning activities)
Lecture / Core Content Delivery	24
Tutorial / Synchronous Support Activity	12
Independent Study	164
n/a	
n/a	
n/a	
TOTAL	200

Indicative Resources
The following materials form essential underpinning for the module content and ultimately for the learning outcomes: The module will use current and relevant web sites and scientific literature. For general revision any recent general molecular Biology, genetic engineering text book. There are many in the library. Background information/revision T.A. Brown. (2017) Genomes 4. Garland Science, ISBN 9780815345084 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. D.S.T. Nicholl (2008) An Introduction to Genetic Engineering, 3rd Edition. Cambridge University Press, ISBN
(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:

Where a module has Professional, Statutory or Regulatory Body requirements these will be listed here: Attendance at synchronous sessions (lectures, workshops, and tutorials), completion of asynchronous activities, and submission of assessments to meet the learning outcomes of the module.

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. 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.
(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	☐ **Pass / Fail** ☒ **Graded**
Module Eligible for Compensation	☐ **Yes** ☒ **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	Biology
Moderator	Steven Kelly
External Examiner	A Tsaousis
Accreditation Details	RSB
Module Appears in CPD catalogue	☐ **Yes** ☒ **No**
Changes / Version Number	2.13

Assessment (also refer to Assessment Outcomes Grids below)
Assessment 1
A final closed book online test worth 60% of the final mark
Assessment 2
Coursework worth 40% of the final mark.

The coursework will consist of a report and a critical evaluation of relevant scientific publications or applications.
Assessment 3
(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)	☒	☒	☒	☐	☐	60	3

Component 2							
Assessment Type	**LO1**	**LO2**	**LO3**	**LO4**	**LO5**	**Weighting of Assessment Element (%)**	**Timetabled Contact Hours**
Review/ Article/ Critique/ Paper	☐	☐	☐	☒	☐	40	0

Component 3							
Assessment Type	**LO1**	**LO2**	**LO3**	**LO4**	**LO5**	**Weighting of Assessment Element (%)**	**Timetabled Contact Hours**
	☐	☐	☐	☐	☐		
Combined total for all components						100%	3 hours

Change Control

What	**When**	**Who**