Programme Handbook

FdSc Biological Laboratory Sciences

University Centre Weston

in partnership with

University of the West of England

UCAS code: BLS1

Programme Leader: Elena Borodina

Contents

1. Introduction

Welcome

Welcome to the FdSc Biological Laboratory Sciences. This course is offered in partnership between UWE and University Centre Weston (UCW). You are a registered student at UWE and at UCW, and you have access to services on both sites.

We hope you have an enjoyable and successful time.

Purpose of the Handbook

This handbook gives you essential background information that will be of help in your studies on the FdSc Biological Laboratory Sciences programme. It provides links to the definitive data sources wherever possible. The handbook can be accessed via your Microsoft Teams (Office 365) account.

Please note that the electronic version will be kept up to date and you will be notified of any significant changes. If you have taken a hard copy of any information please remember to refer back to the electronic version to ensure that you are working with the most up to date information.

For **module information** please see the respective Module Handbook which can also be found in your Microsoft Teams account.

2. Programme content

Programme Distinctiveness

The Foundation Degree in FdSc Biological Laboratory Sciences allows you to study at degree level, and also benefits from a mix of academic and vocational approaches to learning. The FdSc Biological Laboratory Sciences will provide you with a range of opportunities in order to expand your horizons, learn new skills and enhance your knowledge of the Business industry.

The course has been designed in conjunction with employer representatives and by the end of your studies, you will have gained a great deal of practical work-based experience, some of it assessed. After two years of study, you will have a vocational advantage over graduates who have studied courses based on academic knowledge and who may have had very little contact with the industry.

If you successfully gain all the credits necessary to gain the Foundation Degree, you can apply for progression to either the BSc (Hons) Biological Sciences or the MSci Biological Sciences as illustrated in the diagram below (UK's National Qualifications Framework).

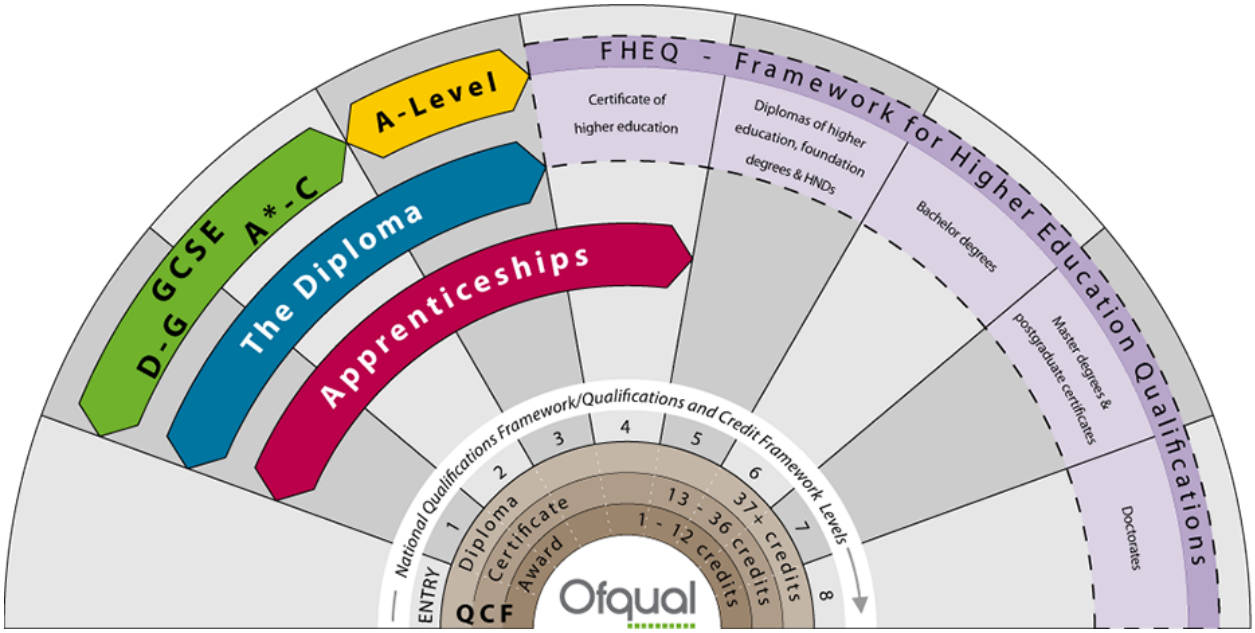

Figure 1: Framework for Higher Education Qualifications

This course has been designed with employability in mind and has been written to enable students to engage with the issues and developments affecting the science laboratory industry. Its vocational focus allows students to spend a significant amount of time within the workplace in order to gain experience, manage a variety of small projects and develop a range of skills. A vocational approach is underpinned by academic theory and industry standards which allow students to assess situations, make comparative judgments and suggest a range of alternative approaches. The modules have

been designed to deliver a balance of theory and practical experience of key aspects of the Science Laboratory industry.

Link Tutor

Each programme has an identified link tutor from its validating partner University whose role it is to support the Weston team. The link tutor for your programme is:

Dr Heather Macdonald	Link tutor (UWE)	UWE	011732 - 82476	heather.macdonald@uwe.ac.uk

Programme structure

Year One

Full time			
Level	**Title**	**Credits**	**Code**
1	Laboratory skills and data analysis for biosciences	30 credits	USSKNH-30-1
1	Practical cell biology and biochemistry	30 credits	USSKNG-30-1
1	Core chemistry	15 credits	USSKNE-15-1
1	Microbiology	15 credits	USSKNF-15-1
1	Anatomy and physiology	15 credits	USSKNC-15-1
1	Environmental sciences	15 credits	USSKND-15-1

Year Two

Full time			
Level	**Title**	**Credits**	**Code**
2	Work based learning	15 credits	USSKNK-15-2
2	Human health and diseases	15 credits	USSKNJ-15-2
2	Ecology and ecosystems	30 credits	USSKNL-30-2
2	Practical applications of molecular biology and biotechnology	30 credits	USSKNM-30-2
2	Research skills and laboratory project	30 credits	USSKNN-30-2

If you are using the electronic version please click on the module title for the full module descriptors for each unit.

All HE programmes at UCW are delivered as a collection of modules, which build on each other to form a complete programme of study. Each module carries a credit rating, defining how much study time it takes to complete. Notionally, 1 credit equates to 10 hours study time (so 10 credits = 100 study hours). “Study hours” includes lectures, seminars, tutorials, group work, independent study and research – in fact, any time that contributes to your learning on the module.

3. Programme Aims

The FdSc Biological Laboratory Sciences programme has a broad based curriculum encompassing the processes and mechanisms of life from the molecular to ecosystem level, in addition to developing in students the understanding of, and ability to engage with, the scientific process. The programme will require students to apply their scientific knowledge to practice-based scenarios, enabling them to plan and set up experiments, analyse results, propose solutions and solve problems. Laboratory tasks will be carried out using current scientific approaches and specialist equipment, whilst also showing an understanding of health and safety requirements.

Students will acquire practical experience in the following biological research methods:

- biochemical testing
- microscopy
- enzyme assays
- extraction and quantification of DNA
- working with microbial cultures
- detection and selection of specific microorganisms
- DNA manipulations
- cloning and recombinant DNA technology
- expression and extraction of proteins
- protein analysis
- immunological assays

The FdSc programme has been designed to enable students to top-up to an Honours degree qualification on the BSc (Hons) Biological Sciences programme delivered by UWE.

The programme has been designed to:

- generate highly experienced and well-skilled graduates within a biological laboratory setting. The laboratory skills developed range from calibrating laboratory equipment to performing genetic manipulations, gene cloning and protein analysis techniques.

- enable graduates to progress into laboratory settings within research institutes, biological sampling and analysis facilities or biotechnology/pharmaceutical industry. Graduates will be able to progress to a laboratory management role or to become a specialist technician within a particular area.
- cover a wide range of topics and practical skills within biosciences and is designed to enable graduates to be flexible with their future career choices and progress into employment or undertake further study.

Programme Learning Outcomes

The specific aims of the programme are to:

- provide an in-depth knowledge base in a wide variety of biosciences areas, linked to a strong provision of laboratory skills and molecular biology techniques.

- ensure that the learning taking place is inquisitive, challenging and successful during each session. The assessment strategy will include written and oral assessments under timed conditions or in a self-directed manner. Assessment types will ensure that students develop excellent time-management, organisational self-management, team and independent working skills.

- Use and interpret literature appropriate to the biological sciences with a full and critical understanding, while addressing such questions as content, context, aims, objectives, quality of information and its interpretation and application.

- Provide a curriculum that is enhanced by the strong relationship between teaching, learning and professional practice that is expected by the work place.

Your Foundation Degree classification

To be awarded a Foundation Degree you will have successfully completed 240 credits at levels 1 and 2 (or above) in total. Only the results for level 2 (or above) modules are used to determine the classification of your Foundation degree.

A Foundation Degree with merit is awarded when an average of 55% or more is achieved across any combination of modules at level 2 or above which are valid for the award and total 100 credits or more.

A Foundation Degree with distinction is awarded when an average of 70% or more is achieved across any combination of modules at level 2 or above which are valid for the award and total 100 credits or more.

Interim Awards

Students who do not complete the course but successfully achieve at least 120 credits will be eligible to receive the interim award of a **Certificate of Higher Education.**

Progressing onto Honours Degree

You can 'top-up' your FdSc degree to a BSc (Honours) degree by an additional year of study.

To be eligible for progression you must have gained 240 credits, 120 credits at Level 4 and 120 credits at Level 5. The deadline for applications is usually on or before 1st May in the final year of Foundation Degree studies.

Your tutor will arrange a meeting with the programme coordinator at UCW to discuss the modules on offer on the top-up degree and answer any questions that you may have. You are also welcome to visit the campus and meet with staff and students.

4. Learning Environment

Learning and Teaching Methods

UCW has a Learning and Teaching Strategy for Higher Education, which underpins our approach. We intend that the learning programme should be both stimulating and demanding, and should lead you through progressive stages of development, towards increasingly complex and open-ended tasks, increasingly sophisticated application of intellectual/conceptual and personal (transferable) skills, and increasingly independent study.

A variety of learning methods will be used, which might include:

- Lectures
- Seminars
- Experiential learning
- Reflective learning
- Skills practice
- Group work and group discussions
- Workshops
- Case studies
- Student presentations
- Information and communications technology (ICT) based activities
- Visiting speakers/expert practitioners will be used during the programme

UCW actively encourages the development of technology enhanced learning and you will find staff utilising new teaching methods to enhance your learning experience.

Work-based Learning

The course has been designed with work placement opportunities in mind. You will have the opportunity of working in a range of businesses related to the Biological Science Laboratory industry including Hospitals, Thatcher's and numerous laboratory testing facilities around Bristol and the South West.

When undertaking a work placement you will be issued with a work placement handbook. The handbook will clearly outline the roles and responsibilities of the student, the work placement host and the University/College. The handbook will also contain guidance on how to make the most of your work placement opportunity.

As a student, you are responsible for organising a work placement. On placement, you must follow the UCW work placement code of practice and conform to the UWE Work Based and Placement Learning Policy.

5. How Quality is Assured

Quality Monitoring and Evaluation

The programme you are studying was approved by UWE. As part of the approval process it was assured that

- the content of the programme met national benchmark requirements;
- the programme met any professional/statutory body requirements; and
- the proposal met other internal quality criteria covering a range of issues such as admissions policy, teaching, learning and assessment strategy and student support mechanisms.

This was done through a process of programme approval which involves consulting academic experts including subject specialists from other institutions and industry.

How we monitor the quality of this programme

The quality of this programme is monitored each year through evaluating:

- external examiner reports (considering quality and standards);
- statistical information (considering issues such as the pass rate); and
- student feedback including the National Student Survey (NSS).

Drawing on this, and other, information programme teams undertake an annual monitoring process, in accordance with the University's quality policy.

Once every six years an in-depth review of the subject area is undertaken by a panel that includes at least two external subject specialists. The panel considers documents, looks at student work, speaks to current and former students and speaks to staff before drawing its conclusions. The result is a report highlighting good practice and identifying areas where action is needed.

The role of the Programme Committee

This course has a Programme Committee comprising all relevant teaching staff, student representatives and others who make a contribution towards its effective operation (e.g. library/technician staff). The Programme Committee has responsibilities for the quality of the programme and plays a critical role in the University's quality assurance procedures.

External Examiners

The standard of this programme is monitored by at least one external examiner. External examiners have two primary responsibilities:

- To ensure the standard of the programme; and
- To ensure fairness and equity.

The external examiner(s) for your programme:

Name (including prefix e.g. Dr.)	Role in institution	Name of institution
Christopher Hutton	UWE Field EE	NA

As part of their role, external examiners complete an annual report for the University commenting on the learning, teaching and assessment standards of the modules and the programme overall. The report will highlight areas of good practice and identify areas for development, as well as provide assurance that your programme is of an equable standard to similar HE provision nationally.

External examiner reports, and the University's response, are shared with students. They are normally discussed at Staff/Student Liaison Committees and made available online, via Microsoft Teams.

External references

The following methods are used for gaining the views of other interested parties:

- Feedback from former students;
- Employers;
- Foundation Degree Characteristics Statement
- Relevant QAA Subject Benchmark Statements

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6. Module Descriptors

This section provides you with the module descriptions for your programme as validated by UWE, Bristol. They should be read in conjunction with the additional information that will be provided in the module brief on Blackboard.

MODULE SPECIFICATION

Part 1: Information			
Module Title	Anatomy and Physiology		
Module Code	USSKNC-15-1	Level	1
For implementation from	September 2020		
UWE Credit Rating	15	ECTS Credit Rating	7.5
Faculty	Health and Applied Sciences	Field	Applied Sciences
Department	Applied Sciences		
Contributes towards	FdSc Biological Laboratory Sciences, compulsory		
Module type:	Standard		
Pre-requisites	None		
Excluded Combinations	None		
Co- requisites	None		
Module Entry requirements	None		

Part 2: Description

This module will cover the following topics within the anatomy and physiology area:

Anatomical terminology as it relates to the following body systems: musculoskeletal, digestive, circulatory, respiratory, endocrine, urinary and nervous systems.

Structure of the heart and major blood vessels, and its relationship with the respiratory system.

The structure of the organs that make up the digestive system, and how their structures enable the specific functions.

Structure and function of the key endocrine organs and their relationship to homeostasis.

Introduction to the nervous system, including the electrochemical nature of nervous signals, membrane and action potentials, nerve conduction, synaptic transmission.

Introduction to the musculoskeletal system and its function.

Introduction to the urinary system and its function in maintaining water balance.

This module aims to deliver specialist knowledge through taught lectures, inductive tutorials, seminars and practical sessions to promote application of knowledge acquired, analytical and problem-solving skills.

Generic Graduate Skill	*Specific strand (eg presentation) - Optional*	**Introduced**	**Developed**	**Evidenced**
1. Communication	Written communication [A, B]	☒	☒	☒
2. Professionalism	Via class discussion, debate	☒	☒	☐
3. Critical Thinking	Literature review [B]	☒	☒	☒
4. Digital Fluency	Digital assignment [B]	☒	☒	☒
5. Innovative and Enterprising		☐	☐	☐
6. Forward Looking		☐	☐	☐
7. Emotional Intelligence		☐	☐	☐
8. Globally Engaged		☐	☐	☐

Part 3: Assessment: Strategy and Details

The assessment strategy has been designed to support and enhance the development of subject-based knowledge and practical skills, whilst ensuring that the learning outcomes are achieved.

Component A is a written 2 hour exam. This assessment will provide students with an opportunity to demonstrate- their knowledge on a broad range of topics and will provide a valuable learning experience through demonstrating and applying knowledge which will be of benefit when progressing to years 2.

The coursework is comprised of a 2000 word essay which will require students to investigate the relationship between different body systems. This assessment will provide a valuable learning experience through independent research of published literature and development of academic writing style.

Opportunities for formative assessment support and feedback are built into teaching and practical sessions, through discussion and evaluation of current research and review of past exam papers. Students are provided with formative feed-forward for their exam through a revision and exam preparation session prior to the exam.

Identify final timetabled piece of assessment (component and element)	**Component A**	
% weighting between components A and B (Standard modules only)	**A:**	**B:**
	50	**50**

First Sit	
Component A (controlled conditions) **Description of each element**	**Element weighting** **(as % of component)**
1. Written examination (2 hrs)	100
Component B **Description of each element**	**Element weighting** **(as % of component)**
1. Essay (2000 words)	100
Resit (further attendance at taught classes is not required)	
Component A (controlled conditions) **Description of each element**	**Element weighting** **(as % of component)**
1. Written examination (2 hrs)	100

Component B **Description of each element**	**Element weighting** **(as % of component)**
1. Essay (2000 words)	100

Part 4: Learning Outcomes & KIS Data

Learning Outcomes	On successful completion of this module students will be able to: • Use and understand basic anatomical terminology (A, B) • Explain the physiological principles of key body systems (A, B) • Undertake independent literature research on key physiological systems (B) • Explain relationships between the structure and function of key systems and their organs (A, B) • Analyse data relating to key body systems and relate outcomes to the relevant physiology (A)
Key Information Sets Information (KIS)	

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	45	105	0	150

The table below indicates as a percentage the total assessment of the module which constitutes a;

Written Exam: Unseen or open book written exam

Coursework: Written assignment or essay, report, dissertation, portfolio, project or in class test

Practical Exam: Oral Assessment and/or presentation, practical skills assessment, practical exam (i.e. an exam determining mastery of a technique)

Contact Hours Total Assessment	Total assessment of the module: Written exam assessment percentage: 50% Coursework assessment percentage: 50% Practical exam assessment percentage: 0% 100%
Reading List	The following book is recommended as it covers most of the module material at an appropriate level. • Cohen, B.J. and Hull, K.L. (2018) *Memmler's The Human Body in Health and Disease*. 14th Ed. Philadelphia: Wolters Kluwer. Extensive notes will be provided via blackboard on the scientific topics. Links to useful and credible websites will also be provided. The students are also advised to consult the basic scientific texts in UCW, Frenchay and Glenside libraries, of which the following is a representative sample: The latest editions of: • Waugh, A and Grant, A. (2014) Ross and Wilson Anatomy and Physiology in Health and Illness. 14th Ed. Churchill Livingstone: London. • Moore, K.L., Dalley, A.F. and M.R. Agur, A.M.R. (2009) *Clinically Oriented Anatomy.* Philadelphia, PA: Lippincott Williams & Wilkins. • Agur, A.M.R., Dalley, A.F. (2012) Grant's *Atlas of Anatomy.* 13th Ed. Philadelphia, PA. Lippincott Williams & Wilkins. • Patton, K.T. and Thibodeau, G.A. (2012) Anatomy *& Physiology* St. Louis, MO: Mosby Elsevier. • Marieb E.N. (2011) Human *Anatomy & Physiology*. 9th ed. London: Pearson. • Martini Ober (2011) Visual *Anatomy & Physiology*. San Fransisco, CA: Benjamin Cummings. • Stanfield CL (2009) Principles *of Human Physiology*. 4th ed. London: Pearson Education Ltd. • Silverthorn D (2010) Human *Physiology an Integrated Approach*. 5th ed. London: Pearson Education Ltd. • Tortora, G.J. & Derrickson, B. (2010*) Essentials of Anatomy & Physiology*. 8th ed. Hoboken, NJ: Wiley.

MODULE SPECIFICATION

Part 1: Information			
Module Title	Core Chemistry		
Module Code	USSKNE-15-1	Level	1
For implementation from	September 2020		
UWE Credit Rating	15	ECTS Credit Rating	7.5
Faculty	Health and Applied Sciences	Field	Applied Sciences
Department	Applied Sciences		
Contributes towards	FdSc Biological Laboratory Sciences, compulsory		
Module type:	Standard		
Pre-requisites	None		
Excluded Combinations	None		
Co- requisites	None		
Module Entry requirements	None		

Part 2: Description

This module will cover the following topics within the area of chemical science:

Structure and bonding:

Why do atoms combine into complex molecules and materials, and how does this influence their chemical and physical properties? Chemical combinations - origins of ionic and covalent bonding related to atomic structure and the Periodic Table; electronegativity, polar bonds and intermolecular forces. Naming and structures of important organic and inorganic compounds.

Chemical reactions:

Nature and order of chemical reactions. Redox and acid-base reactions. Neutralisation and titration procedure. Introduction to stability of atoms, molecules and mixtures. Enthalpy of combustion. Factors influencing the rate of a chemical reaction. Experimental and mathematical methods for rates of reactions.

Organic chemistry:

Identifying organic functional groups and ring systems. Synthesis and reactivity of aromatic and non-aromatic ring systems. Fundamental stereochemistry in the context of drugs and biochemistry - structural isomers and stereoisomers. Common synthetic reactions in organic synthesis.

This module aims to deliver specialist knowledge through taught lectures, seminars and practical sessions to promote application of knowledge acquired, analytical and problem-solving skills.

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

Generic Graduate Skill	*Specific strand (eg presentation) - Optional*	**Introduced**	**Developed**	**Evidenced**
1. Communication	Written communication [A, B]	☐	☐	☒
2. Professionalism	Practical exam; practical sessions [B]	☐	☐	☒
3. Critical Thinking	Evaluation of experiments [B]	☐	☐	☒
4. Digital Fluency	Digital assignment [B]	☐	☐	☒
5. Innovative and Enterprising		☐	☐	☐
6. Forward Looking		☒	☐	☐
7. Emotional Intelligence		☐	☐	☐

8. Globally Engaged		☐	☐	☐

Part 3: Assessment: Strategy and Details

The assessment strategy has been designed to support and enhance the development of subject-based knowledge and practical skills, whilst ensuring that the learning outcomes are achieved.

The controlled component is comprised of a 2hour practical exam. This assessment will include demonstration of practical skills and application of problem-solving, evaluative and mathematical skills to perform a laboratory procedure.

The coursework is comprised of a workbook consisting of problem solving and data analysis tasks. This assessment will enable students to develop critical thinking and problem-solving skills, as well as deepen understanding of chemistry.

Opportunities for formative feedback are built into teaching and practical sessions. Students are provided with formative feed-forward for their practical exam through laboratory sessions and seminars.

Identify final timetabled piece of assessment (component and element)	**Component A**	
% weighting between components A and B (Standard modules only)	**A:**	**B:**
	50	**50**

First Sit	
Component A (controlled conditions) **Description of each element**	**Element weighting** **(as % of component)**
1. Practical exam (2 hours)	100
Component B **Description of each element**	**Element weighting** **(as % of component)**
1. Workbook	100
Resit (further attendance at taught classes is not required)	

Component A (controlled conditions) **Description of each element**	**Element weighting** **(as % of component)**
1. Practical Exam (2 hours)	100
Component B **Description of each element**	**Element weighting** **(as % of component)**
1. Workbook	100

Part 4: Learning Outcomes & KIS Data

Learning Outcomes	On successful completion of this module students will be able to: • Apply mathematical skills to the analysis of experimental data (A) • Apply practical techniques encountered in chemistry and analyse, evaluate and present data in a controlled environment (A) • Apply problem solving and critical thinking skills to theoretical tasks covering various chemistry topics (B) • Demonstrate understanding of various concepts encountered in chemistry (B) •
Key Information Sets Information (KIS)	

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	45	105	0	150

Contact Hours

The table below indicates as a percentage the total assessment of the module which constitutes a;

Written Exam: Unseen or open book written exam

Coursework: Written assignment or essay, report, dissertation, portfolio, project or in class test

Practical Exam: Oral Assessment and/or presentation, practical skills assessment, practical exam (i.e. an exam determining mastery of a technique)

Total Assessment	Total assessment of the module: Written exam assessment percentage: 0% Coursework assessment percentage: 50% Practical exam assessment percentage: 50% 100%
Reading List	The following book is recommended as it covers most of the module material at an appropriate level. • W.H. Freeman, Lewis, R. and Evans, W. (2011) *Chemistry*. 4th ed. Basingstoke: Palgrave Macmillan Extensive notes will be provided via blackboard on the scientific topics. Links to useful and credible websites will also be provided. The students are also advised to consult the basic scientific texts in UCW, Frenchay and Glenside libraries, of which the following is a representative sample: The latest editions of: • Johll, M E, (2009) *Investigating Chemistry, a Forensic Science Perspective*.2nd ed. • Crowe, J. and Bradshaw, T. (2010) *Chemistry for the Biosciences*.2nd ed. Oxford: Oxford University Press. • Volhardt P. Schore N., (2009) *Organic Chemistry - structure and function*. 6th ed. London: Freeman Palgrave Macmillan.

MODULE SPECIFICATION

Part 1: Information			
Module Title	Microbiology		
Module Code	USSKNF-15-1	Level	1
For implementation from	September 2020		
UWE Credit Rating	15	ECTS Credit Rating	7.5
Faculty	Health and Applied Sciences	Field	Applied Sciences
Department	Applied Sciences		
Contributes towards	FdSc Biological Laboratory Sciences, compulsory		
Module type:	Standard		
Pre-requisites	None		
Excluded Combinations	None		
Co- requisites	None		
Module Entry requirements	None		

Part 2: Description

This module will cover the following topics within the area of microbiology:

Three principal themes will underpin the delivery of this module: medical, industrial and ecological. These themes run throughout the syllabus.

Growth and identification of microorganisms: students will develop knowledge of the identification, characterisation and identification of microorganisms. Students will also investigate growth characteristics of microorganisms and variety of nutritional requirements.

Roles of microorganisms in various ecosystems: students will develop an understanding of the role and significance of microorganisms in marine and terrestrial ecosystems and their importance in biogeochemical cycles.

Microorganisms in health and disease: Students will develop an understanding of the role of the normal flora of the human body in both health and disease. Students will be introduced to a variety of infectious diseases, anti-microbial agents and current issues of antibiotic resistance.

Microbial biotechnology: students will develop an understanding of the utility of microorganisms within industry and scientific research.

Generic Graduate Skill	*Specific strand (eg presentation) - Optional*	**Introduced**	**Developed**	**Evidenced**
1. Communication	Written communication and oral presentation [A, B]	☐	☐	☒
2. Professionalism	Practical sessions [B]	☒	☐	☐
3. Critical Thinking	Evaluation of experiments [B]	☐	☐	☒
4. Digital Fluency	Digital assignment [A, B]	☐	☐	☒
5. Innovative and Enterprising		☐	☐	☐
6. Forward Looking	Analysis of research papers [B]	☒	☐	☐
7. Emotional Intelligence		☐	☐	☐
8. Globally Engaged	Current issues in microbiology [B]	☒	☐	☐

Part 3: Assessment: Strategy and Details

The assessment strategy has been designed to support and enhance the development of subject-based

knowledge and practical skills, whilst ensuring that the learning outcomes are achieved.

Component A is a 15 minute oral presentation, followed by a 5 minute Q&A session. This assessment will provide students with an opportunity to demonstrate both their knowledge and science communication skills.

The coursework is comprised of four practical reports based on the selection of nine practical experiments carried out during laboratory sessions. This assessment will provide a valuable practical learning experience during which students will develop laboratory skills and aseptic techniques employed in the field of microbiology. In addition, students will be required to carry out independent research of published literature and development of academic writing style.

Opportunities for formative assessment and feedback are built into teaching and practical sessions, through discussion and evaluation of laboratory experiments.

Identify final timetabled piece of assessment (component and element)	**Component B**	
% weighting between components A and B (Standard modules only)	**A:**	**B**:
	30	**70**

First Sit	
Component A (controlled conditions) **Description of each element**	**Element weighting** **(as % of component)**
1. Oral presentation (15 min)	100
Component B **Description of each element**	**Element weighting** **(as % of component)**
1. Practical reports (1,200 words per report)	100
Resit (further attendance at taught classes is not required)	
Component A (controlled conditions) **Description of each element**	**Element weighting** **(as % of component)**
1. Oral presentation (15 min)	100

Component B **Description of each element**	**Element weighting** **(as % of component)**
1. Practical reports based on secondary data (1,200 words per report)	100

Part 4: Learning Outcomes & KIS Data

Learning Outcomes	On successful completion of this module students will be able to: • Investigate the diversity of microorganisms and their roles in human health, industry and the environment and communicate findings in a presentation format (A) • Explain the significance of microbiological techniques in identification and classification of microorganisms (B) • Evaluate the effectiveness of antimicrobial agents on the growth of microorganisms (B) • Understand practical techniques carried out in a microbiology laboratory; analyse and evaluate data derived from laboratory study of microorganisms (B)
Key Information Sets Information (KIS)	

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	45	105	0	150

The table below indicates as a percentage the total assessment of the module which constitutes a;

Written Exam: Unseen or open book written exam

Coursework: Written assignment or essay, report, dissertation, portfolio, project or in class test

Practical Exam: Oral Assessment and/or presentation, practical skills assessment, practical exam (i.e. an exam determining mastery of a technique)

Contact Hours Total Assessment	Total assessment of the module: Written exam assessment percentage: 0% Coursework assessment percentage: 70% Practical exam assessment percentage: 30% 100%
Reading List	The following book is recommended as it covers most of the module material at an appropriate level. • Willey, J.M., Sherwood, L.M., Woolverton, C.J. (2017) *Prescott's Microbiology*; 10th ed. New York: McGraw-Hill. • Madigan, M.T., Bender, K.S., Buckley, D.H., Sattley, W.M. and Stahl, D.A. (2018) *Brock Biology of Microorganisms*. 15th ed. Harlow: Pearson. Extensive notes will be provided via blackboard on the scientific topics. Links to useful and credible websites will also be provided. The students are also advised to consult the basic scientific texts in UCW, Frenchay and Glenside libraries, of which the following is a representative sample: The latest editions of: • Baker, S., Griffiths, C., Nicklin, J. (2011) *BIOS Instant Notes Microbiology*, 4th ed. New York and London: Garland Science. • Harper, D.R. (2012) *Viruses-Biology/Applications/Control*. New York: Garland Science • Irving, W., Boswell, T., Ala'Aldeen (2005) *BIOS Instant Notes Medical Microbiology*. New York: Garland Science. • Strelkauskas, A., Strelkauskas, J., Moszyk-Strelkauskas, D. (2010) *Microbiology, a clinical approach*. New York: Garland Science. The following journals may also include relevant material and are available through the UWE Library: • Trends in Microbiology • Nature • Microbiology

MODULE SPECIFICATION

Part 1: Information			
Module Title	Environmental Sciences		
Module Code	USSKND-15-1	Level	1
For implementation from	September 2020		
UWE Credit Rating	15	ECTS Credit Rating	7.5
Faculty	Health and Applied Sciences	Field	Applied Sciences
Department	Applied Sciences		
Contributes towards	FdSc Biological Laboratory Sciences, compulsory		
Module type:	Standard		
Pre-requisites	None		
Excluded Combinations	None		
Co- requisites	None		
Module Entry requirements	None		

Part 2: Description

This module will cover the following topics within the area of environmental science:

Introduction to ecology: introduction to ecological principles, such as food chains and webs, essential nutrients, symbiosis, mutualism, intra- and inter-specific competition and niche theory. Components of ecosystems: biotic and abiotic, trophic levels, energy flows and nutrient cycles.

Principles of organism taxonomy and interactions between various kingdoms: classification and key features of plant, animal and microorganism groups; interactions and relationships between plant, animal and microorganisms in ecological systems.

Sampling strategies and data collection techniques: obtaining, recording and interpreting data using appropriate techniques in the field and laboratory. Introduction to statistics for biology.

This module aims to deliver specialist knowledge through taught lectures, tutorials, seminars, fieldwork and practical sessions. This will promote application of acquired knowledge, analytical and problem-solving skills.

Generic Graduate Skill	*Specific strand (eg presentation) - Optional*	**Introduced**	**Developed**	**Evidenced**
1. Communication	Written communication [A, B], team work [A]	☒	☒	☒
2. Professionalism	Reflective practice [A]	☒	☒	☒
3. Critical Thinking	Literature review [A, B]	☒	☒	☒
4. Digital Fluency	Digital assignments [A, B]	☒	☒	☒
5. Innovative and Enterprising	Via class discussion, debate	☒	☐	☐
6. Forward Looking	Via class discussion, debate	☒	☒	☐
7. Emotional Intelligence	Via class discussion, debate	☒	☐	☐
8. Globally Engaged	Via class discussion, debate	☒	☒	☐

Part 3: Assessment: Strategy and Details

The assessment strategy has been designed to support and enhance development of subject-based knowledge and practical skills, whilst ensuring that the learning outcomes are achieved.

Component A: A poster presentation on a practical ecological investigation, including data presentation and statistical analysis. This assessment will develop student's communication and scientific presentation skills,

alongside analytical and practical skills.

Component B: Investigative report: students will complete a 2000 word report investigating the impact of human activity on an ecological area and its biodiversity. This assessment will provide a valuable learning experience through independent research of published literature and development of academic writing style.

Opportunities for formative feedback are built into teaching and practical sessions, through discussion and evaluation of current practice.

Identify final timetabled piece of assessment (component and element)	**Component B**

% weighting between components A and B (Standard modules only)	**A:**	**B:**
	30	**70**

First Sit	
Component A (controlled conditions) **Description of each element**	**Element weighting** **(as % of component)**
1. Poster presentation	100
Component B **Description of each element**	**Element weighting** **(as % of component)**
1. Investigative report (2000 words)	100
Resit (further attendance at taught classes is not required)	
Component A (controlled conditions) **Description of each element**	**Element weighting** **(as % of component)**
1. Poster presentation	100
Component B **Description of each element**	**Element weighting** **(as % of component)**
1. Investigative report (2000 words)	100

Part 4: Learning Outcomes & KIS Data

Learning Outcomes

On successful completion of this module students will be able to:

- Explain key ecological principles (A, B)
- Collect, record and interpret data using appropriate techniques in the field or/and laboratory (A)
- Evaluate the impact of human activities at a particular location on the biodiversity of the surrounding ecosystem (B)
- Demonstrate scientific communication skills through the presentation of experimental data in poster format (A)

Key Information Sets Information (KIS)

Contact Hours

Hours to be allocated	Scheduled learning and teaching study hours	Independent study hours	Placement study hours	Allocated Hours	
150	45	105	0	150	

Total Assessment

The table below indicates as a percentage the total assessment of the module which constitutes a;

Written Exam: Unseen or open book written exam

Coursework: Written assignment or essay, report, dissertation, portfolio, project or in class test

Practical Exam: Oral Assessment and/or presentation, practical skills assessment, practical exam (i.e. an exam determining mastery of a technique)

Total assessment of the module:	
Written exam assessment percentage	0%
Coursework assessment percentage	70%
Practical exam assessment percentage	30%
	100%

Reading List

The following book is recommended as it covers most of the module material at an appropriate level.

- Begon, M., Harper, J.L. & Townsend, C.R. Ecology: individuals, populations and communities. Blackwell Scientific Publications, Cambridge.

Extensive notes will be provided via blackboard on the scientific topics. Links to useful and credible websites will also be provided.

The students are also advised to consult the basic scientific texts in UCW, Frenchay and Glenside libraries, of which the following is a representative sample:

The latest editions of:

- Brooker, R.J. and co-authors Biology, McGraw-Hill, New York.
- Campbell, N.A, Reece, J.B & Urry, L. Biology, Cummings, San Francisco.
- Mason, K.A., Losos, J.B., Singer, S., Raven, P.H., Johnson, G.B. Biology. McGraw-Hill, New York.
- Sadava, D. and co-authors *Life:* The Science of Biology*,* Sinauer Associates, Sunderland, MA.

Further Reading

The following texts are recommended as further reading. However, students are not recommended to purchase these unless they intend taking further, more specialised modules in these topics later in their degree programme.

The most recent editions of:

- Krukonis G & Barr T. Evolution for Dummies. Wiley USA. *e-book: full text available online.*
- Prescott, Harley & Klein Microbiology Published by McGraw Hill.
- Smith A. Plant Biology, Garland Science
- Schmidt-Nielsen, K. Animal physiology: adaptation and environment. Cambridge University Press, Cambridge.
- Willmer, P., Stone, G.& Johnston, I. Environmental Physiology of Animals. Blackwell Scientific Ltd. Oxford.

The following journals may also include relevant material and are available through the UWE Library:

- Trends in Ecology and Evolution
- Nature

MODULE SPECIFICATION

Part 1: Information			
Module Title	Practical Cell Biology and Biochemistry		
Module Code	USSKNG-30-1	Level	1
For implementation from	September 2020		
UWE Credit Rating	30	ECTS Credit Rating	15
Faculty	Health and Applied Sciences	Field	Applied Sciences
Department	Applied Sciences		
Contributes towards	FdSc Biological Laboratory Sciences, compulsory		
Module type:	Standard		
Pre-requisites	None		
Excluded Combinations	None		
Co- requisites	None		
Module Entry requirements	None		

Part 2: Description

This module will cover the following topics:

Biological chemistry: structure and function of biological macromolecules.

Cell Biology: structure and function of prokaryotic and eukaryotic cells and their organelles. Membrane structure and transport across membranes via diffusion, carrier proteins, channels, active transport.

Key techniques in cell biology, biochemistry and genetics: microscopy, PCR, analysis of DNA and protein by gel electrophoresis, enzyme kinetics.

Introduction to metabolism: an overview of catabolic and anabolic pathways. Enzymes as biological catalysts and factors influencing rates of enzymatic reactions. The major pathways of carbohydrate and lipid metabolism and their significance in health and disease.

Studying genes: genes and gene expression: transcription, RNA processing and translation. DNA replication. Role of mutations. PCR and gene cloning.

Inheriting genes. Mendelian genetics. Gene inheritance patterns in humans and molecular approaches to diagnosing and treatments of genetic disorders.

This module aims to deliver specialist knowledge through taught lectures, seminars and practical sessions to promote application of knowledge acquired, analytical and problem-solving skills.

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

Generic Graduate Skill	*Specific strand (eg presentation) - Optional*	**Introduced**	**Developed**	**Evidenced**
1. Communication	Written and oral communication [A, B1, B2]	☐	☐	☒
2. Professionalism	Practical lab work; team work [B2]	☐	☒	☐
3. Critical Thinking	Evaluation of experiments [B2]	☐	☐	☒
4. Digital Fluency	Digital assignments [B1, B2]	☐	☐	☒
5. Innovative and Enterprising	Via class discussion, debate, lab reports; reflection on current applications of biochemistry and genetics techniques [B1, B2]	☒	☐	☐
6. Forward Looking	Via class discussion, debate, essay; reflection on current applications of	☒	☐	☐

	biochemistry and genetics techniques [B1, B2]			
7. Emotional Intelligence	Via class discussion, debate; essay; ethical issues within modern medicine and gene therapy [B1, B2]	☒	☐	☐
8. Globally Engaged	Via class discussion, debate, essay; reflection on current applications of biochemistry and genetics techniques; ethical issues [B1, B2]	☒	☐	☐

Part 3: Assessment: Strategy and Details

The assessment strategy has been designed to support and enhance the development of subject-based knowledge and practical skills, whilst ensuring that the learning outcomes are achieved.

Component A is a *viva voce* (20 minute). This assessment will provide students with an opportunity to demonstrate depth and breadth of their knowledge on a broad range of topics through a series of questions and discussions. This assessment will test a range of the learning outcomes and will provide a valuable learning experience of a viva.

The coursework is comprised of a 1500 word essay and laboratory reports arising from primary and/or secondary data. This assessment will provide a valuable practical learning experience, development of analytic skills, as well as independent research of published literature and development of academic writing style.

Opportunities for formative assessment and feedback are built into teaching and practical sessions, through discussion and evaluation of current research and review of past exam papers. Students are provided with formative feed-forward for their viva through revision and preparation sessions.

Identify final timetabled piece of assessment (component and element)	**Component B, element 2**	
% weighting between components A and B (Standard modules only)	**A:**	**B**:
	40	**60**

First Sit

Component A (controlled conditions) **Description of each element**	**Element weighting**

	(as % of component)
1. Oral exam (viva) – 20 min	100
Component B **Description of each element**	**Element weighting** **(as % of component)**
1. Essay (1500 words)	30
2. Laboratory Reports	70
Resit (further attendance at taught classes is not required)	
Component A (controlled conditions) **Description of each element**	**Element weighting** **(as % of component)**
1. Oral exam (viva) – 20 min	100
Component B **Description of each element**	**Element weighting** **(as % of component)**
1. Essay (1500 words)	30
2. Laboratory Reports based on secondary data	70

Part 4: Learning Outcomes & KIS Data

Learning Outcomes	On successful completion of this module students will be able to: • describe the ultrastructure and function of prokaryotic and eukaryotic cells, organelles and biological membranes [A1] • describe the key features and properties of nucleic acids, proteins, lipids and carbohydrates [A1] • describe key pathways in carbohydrate and lipid metabolism and explain how energy from metabolism is channelled into ATP synthesis [A1] • describe the modes of inheritance and explain how genetic material can be altered [B1] • demonstrate key practical skills and skills of data analysis in cell biology, genetics and biochemistry [B2] • discuss current applications and impact of cell biology, genetics and biochemistry [B1,B2]

Key Information Sets Information (KIS)

Contact Hours

Key Information Set - Module data				
Number of credits for this module				30
Hours to be allocated	Scheduled learning and teaching study hours	Independent study hours	Placement study hours	Allocated Hours
300	90	210	0	300

Total Assessment

The table below indicates as a percentage the total assessment of the module which constitutes a;

Written Exam: Unseen or open book written exam

Coursework: Written assignment or essay, report, dissertation, portfolio, project or in class test

Practical Exam: Oral Assessment and/or presentation, practical skills assessment, practical exam (i.e. an exam determining mastery of a technique)

Total assessment of the module:	
Written exam assessment percentage	0%
Coursework assessment percentage	60%
Practical exam assessment percentage	40%
	100%

Reading List

The following book is recommended as it covers most of the module material at an appropriate level.

- Alberts, B., Hopkin, K., Johnson, A.D., Morgan, D. and Raff, M. (2019) *Essential Cell Biology*. 5th ed. New York: W. W. Norton & Company.

Extensive notes will be provided via blackboard on the scientific topics. Links to useful and credible websites will also be provided.

The students are also advised to consult the basic scientific texts in UCW, Frenchay and Glenside libraries, of which the following is a representative sample:

	The latest editions of: • Lodish, H. et al., *Molecular Cell Biology*, New York: W.H. Freeman and Company. • Alberts, B. et al. (2014) *Molecular Biology of the Cell*, London: Garland Science. • Nelson, D.L. and Cox, M.M. (2008) *Principles of Biochemistry*, New York: W.H. Freeman. • Berg, J.M., Tymoczko, J.L., Gatto, G. and Stryer, L. (2019) *Biochemistry*. 9th ed. New York: W.H. Freeman. Further reading must include the following academic journals*:* Trends in Genetics Nature Genetics Nature Reviews PLoS

MODULE SPECIFICATION

Part 1: Information			
Module Title	Laboratory skills and data analysis for biosciences		
Module Code	USSKNH-30-1	Level	1
For implementation from	September 2020		
UWE Credit Rating	30	ECTS Credit Rating	15
Faculty	Health and Applied Sciences	Field	Applied Sciences
Department	Applied Sciences		
Contributes towards	FdSc Biological Laboratory Sciences, compulsory		
Module type:	Standard		
Pre-requisites	None		
Excluded Combinations	None		
Co- requisites	None		
Module Entry requirements	None		

Part 2: Description

This is a skills based module and aims to support and enhance the development of both subject-based and transferable key skills. Specifically this module will introduce the following:

Laboratory skills: basic laboratory skills such as making up solutions, pipetting, titrating and use of microscopes and other specialist equipment. Additional activities may include: spectrophotometry; acid base theory and buffer solutions; gel electrophoresis and PCR.

Laboratory management skills, data collection and analysis: health and safety, control of substances hazardous to health (COSHH), planning and carrying out an experiment, resource management, collecting experimental data and interpretation of data, data analysis and presentation.

Analytical and Maths skills: application of mathematical calculations in biosciences, such as scientific equations and formulae, exponential and logarithmic functions, equations of growth and decay, reaction rates and kinetics.

Maths skills and data analysis: appreciation of variability in scientific data and experimental uncertainty, testing of hypothesis and making decisions, analysing and interpreting scientific data using IT software.

Part 3: Assessment

The assessment strategy has been designed to support and enhance the development of key laboratory and transferable skills which will enable graduates to be confident and competent within a laboratory based work place.

Component A is a three hour open assessed practical. The practical assessment will require students to demonstrate appropriate laboratory techniques and methodology; adhere to health and safety guidance; undertake calculations; collect, process and manipulate laboratory data; draw and display data; analyse and evaluate data. The controlled practical assessment replicates the world of work where samples and data need to be analysed and interpreted correctly within a short deadline.

Component B is a lab book comprised of a portfolio of laboratory notes and discussions, based on the practical experiments carried out during laboratory sessions. The practical portfolio will provide an opportunity for students to demonstrate their ability to apply analytical, data analysis, evaluative and problem solving skills. This assessment will also provide essential practical experience during which students will develop laboratory skills.

Formative feedback is available to students throughout the module during group discussions and practical laboratory sessions. Students are provided with formative feed-forward for their practical assessment through continuous practical sessions and through the extensive support materials supplied.

Identify final timetabled piece of assessment (component and element)	**Component A**	
% weighting between components A and B (Standard modules only)	**A:**	**B**:

	50	**50**
First Sit		
Component A (controlled conditions) **Description of each element**	**Element weighting** **(as % of component)**	
1. Group practical assessment (3 hour)	100	
Component B **Description of each element**	**Element weighting** **(as % of component)**	
1. Portfolio of evidence (lab book)	100	
Resit (further attendance at taught classes is not required)		
Component A (controlled conditions) **Description of each element**	**Element weighting** **(as % of component)**	
1. Practical assessment (3 hour)	100	
Component B **Description of each element**	**Element weighting** **(as % of component)**	
1. Problem solving exercise	100	
Part 4: Learning Outcomes & KIS Data		
Learning Outcomes	On successful completion of this module students will be able to: • Perform basic scientific calculations relevant to the biological sciences (A, B) • Undertake a range of standard laboratory procedures by using appropriate equipment in a safe manner (A) • Present, analyse and interpret laboratory data using appropriate mathematical, statistical and communication skills (A,B) • Critically evaluate laboratory data and suggest appropriate improvements (B)	

Key Information Sets Information (KIS)

Contact Hours

Key Information Set - Module data

Number of credits for this module	30

Hours to be allocated	Scheduled learning and teaching study hours	Independent study hours	Placement study hours	Allocated Hours
300	90	210	0	300

Total Assessment

The table below indicates as a percentage the total assessment of the module which constitutes a;

Written Exam: Unseen or open book written exam

Coursework: Written assignment or essay, report, dissertation, portfolio, project or in class test

Practical Exam: Oral Assessment and/or presentation, practical skills assessment, practical exam (i.e. an exam determining mastery of a technique)

Total assessment of the module:	
Written exam assessment percentage	0%
Coursework assessment percentage	50%
Practical exam assessment percentage	50%
	100%

Reading List

The following book is recommended as it covers most of the module material at an appropriate level.

- Jones, A., Reed,R., & Weyers, J. *Practical Skills in Biology*. Harlow: Pearson Education.

Extensive notes will be provided via blackboard on the scientific topics. Links to useful and credible websites will also be provided.

The students are also advised to consult the basic scientific texts in UCW, Frenchay and Glenside libraries, of which the following is a representative sample:

The latest editions of:

- Currell, G. and Downman, A.A. *Essential Mathematics and Statistics for Science*. Chichester: Wiley-Blackwell.
- Millican, P. and Heritage, J. *Studying Science: A Guide to Undergraduate Success.* New Delhi: Viva Books.

	• Cottrell, S. *The Study Skills Handbook*. Basingstoke: Palgrave Macmillan. • Cann, A. *Maths from Scratch for Biologists*. New York: John Wiley. • Dytham, C. *Choosing and Using Statistics.* Oxford: Blackwell.

MODULE SPECIFICATION

Part 1: Information			
Module Title	Practical applications of molecular biology and biotechnology		
Module Code	USSKNM-30-2	Level	2
For implementation from	September 2018		
UWE Credit Rating	30	ECTS Credit Rating	15
Faculty	Health and Applied Sciences	Field	Applied Sciences
Department	Applied Sciences		
Contributes towards	FdSc Biological Laboratory Sciences, compulsory		
Module type:	Standard		
Pre-requisites	None		
Excluded Combinations	None		
Co- requisites	None		

Module Entry requirements	None

Part 2: Description
This module will cover the following topics within molecular biology field: Principles of gene cloning: purification of DNA and manipulation of DNA fragments and vectors for gene cloning, application of enzymes in molecular biology. . ~~Manipulation of purified DNA with the use of enzymes: restriction endonucleases, DNA polymerase and ligase~~. ~~Introduction of DNA into living cells~~Cloning: transformations (the uptake of DNA by bacterial cells), identification and analysis of recombinants; evaluation of transformation efficiency. ~~; and introduction of DNA into non-bacterial cells.~~ ~~Isolation a specific gene, clone identification and gene analysis: direct selection, identification and analysis of a clone from a gene library, DNA sequencing.~~ Amplification of DNA: the polymerase chain reaction (PCR), optimisation of PCR protocols, analysis or PCR products, real time PCR. Protein analysis: an overview of protein structure and function. Protein folding and denaturation. The importance of protein folding in health and disease. Protein purification and analysis of proteins by gel electrophoresis. Analysis of gene expression: the structure of genes, RNA, transcription and protein synthesis, ~~a nd the~~ control of gene express~~ion.~~ Applications of gene cloning and DNA analysis in biotechnology Production of a protein from cloned genes - Special vectors for expression of foreign genes in *E. coli*, problems with the production of recombinant protein in *E. coli*, production of recombinant protein by eukaryotic cells. Gene cloning and DNA analysis in medicine – Production of recombinant pharmaceuticals, identification of genes responsible for human disease, gene therapy. Gene cloning and DNA analysis in agriculture – Gene addition approach to plant genetic engineering, gene subtraction, problems with genetically modified plants. Gene cloning and DNA analysis in forensic science– DNA analysis in the identification of crime suspects. This module aims to deliver specialist knowledge through taught lectures, seminars and practical sessions to promote application of knowledge acquired and analytical and problem-solving skills.~~Independent learning includes hours engaged with essential reading, case study preparation, assignment preparation and completion etc~~

Generic Graduate Skill	*Specific strand (eg presentation) - Optional*	Introduced	Developed	Evidenced
1. Communication	Written communication [A, B1, B2]	☐	☐	☒
2. Professionalism	Reflective practice [B2]	☐	☐	☒
3. Critical Thinking	Literature review and evaluation of experiments [B1, B2]	☐	☐	☒
4. Digital Fluency	Digital assignments [B1, B2]	☐	☐	☒
5. Innovative and Enterprising	Via class discussion, debate, literature review, evaluation of current and potential applications of biotechnology, evaluations of ethical issues [B1, B2]	☐	☒	☐
6. Forward Looking	Via class discussion, debate, literature review, evaluation of current and potential applications of biotechnology, evaluations of ethical issues [B1, B2]	☐	☒	☐
7. Emotional Intelligence	Via class discussion, debate	☒	☐	☐
8. Globally Engaged	Via class discussion, debate, literature review, evaluation of current and potential applications of biotechnology, evaluations of ethical issues [B1, B2]	☐	☒	☐

Part 3: Assessment: Strategy and Details

The assessment strategy has been designed to support and enhance the development of subject-based knowledge and practical skills, whilst ensuring that the learning outcomes are achieved.

Component A is a 2 hour exam. This assessment will provide students with an opportunity to demonstrate the

depth and breadth of their knowledge on a broad range of topics. This assessment will test a range of the learning outcomes.

The coursework consists of two parts: a 1500 literature review (B1) and a portfolio of laboratory reports based on primary or secondary data (B2). Component B2 will provide a valuable practical learning experience and will further develop laboratory skills and understanding of molecular biology applications. Component B1 will include independent research of published ~~literature will focus~~literature focused around ~~the~~ biotechnological processes and ethical issues of DNA manipulation and cloning.

Opportunities for formative ~~assessment and~~ feedback are built into teaching and practical sessions, through discussion and evaluation of current research and ~~review of past exam papers~~practical sessions. Students are provided with formative feed-forward for their exam through a revision and exam preparation session prior to the exam

~~All work is marked in line with the Faculty of Health and Applied Sciences generic assessment criteria .~~

Identify final timetabled piece of assessment (component and element)	**Component B1 ~~A~~**	
% weighting between components A and B (Standard modules only)	**A:**	**B**:
	40	**60**
First Sit		
Component A (controlled conditions) **Description of each element**	**Element weighting** **(as % of component)**	
1. Examination (2 hours)	100	
Component B **Description of each element**	**Element weighting** **(as % of component)**	
1. Literature review (1500 words)	40	
2. Practical portfolio based on primary or secondary data	60	
Resit (further attendance at taught classes is not required)		
Component A (controlled conditions) **Description of each element**	**Element weighting** **(as % of component)**	

1. Examination (2 hours)	100
Component B **Description of each element**	**Element weighting** **(as % of component)**
1. Literature review (1500 words)	40
2. ~~Data interpretation~~Practical portfolio based on secondary data	60

Part 4: Learning Outcomes & KIS Data

Learning Outcomes	On successful completion of this module students will be able to: • ~~Identify and review~~Review ~~the~~ current techniques used for the isolation, manipulation ~~, cloning~~ and ~~,~~ analysis ~~and characterisation~~ of genes and their products within organisms (B2)~~.~~ • Evaluate the research process through appreciation of practical experience of molecular biology ~~genetics and DNA analysis~~ and be able to interpret primary or secondary experimental data ~~obtained from such analysis~~ (B2)~~.~~ • Discuss key structural features of proteins and the forces directing protein folding highlighting the protein-function relationship (A). • Show an understanding of gene structure and explain the process of gene expression and regulation (A) • Evaluate current and potential applications of biotechnology, the ethical issues raised and the impact on human society (B1)~~.~~ • Use appropriate information technology resources and sources of information to seek, retrieve and interpret subject specific material alongside the acquisition of other key generic graduate skills, such as academic writing, interpreting information, evaluating research data and critical thinking -(B1, B2)
Key Information Sets Information (KIS) Contact Hours	**Key Information Set - Module data** *Number of credits for this module* 30 Hours to be allocated: 300 Scheduled learning and teaching study hours: 90 Independent study hours: 210 Placement study hours: 0 Allocated Hours: 300 The table below indicates as a percentage the total assessment of the module which constitutes a;

<table>
<tr>
<td>Total Assessment</td>
<td>

Written Exam: Unseen or open book written exam

Coursework: Written assignment or essay, report, dissertation, portfolio, project or in class test

Practical Exam: Oral Assessment and/or presentation, practical skills assessment, practical exam (i.e. an exam determining mastery of a technique)

<table>
<tr><td colspan="3">Total assessment of the module:</td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="4">Written exam assessment percentage</td><td>40%</td></tr>
<tr><td colspan="4">Coursework assessment percentage</td><td>60%</td></tr>
<tr><td colspan="4">Practical exam assessment percentage</td><td>0%</td></tr>
<tr><td></td><td></td><td></td><td></td><td>100%</td></tr>
</table>

</td>
</tr>
<tr>
<td>Reading List</td>
<td>

The following books are recommended as it covers most of the module material at an appropriate level.

- Alberts B.et al., *Molecular Biology of the Cell*, Abingdon: Garland Science.
- Brown, T.A. *Gene Cloning and DNA Analysis*. Oxford: Blackwell.
- Primrose, S.B. & R.M. Twyman, *Principles of Gene Manipulation & Genomics*. Oxford: Blackwell.

Extensive notes will be provided via blackboard on the scientific topics. Links to useful and credible websites will also be provided.

The students are also advised to consult the basic scientific texts in UCW, Frenchay and Glenside libraries, of which the following is a representative sample:

The latest editions of:

- Alberts B. et al., *Essential Cell Biology*, Abingdon: Garland Science.
- Brown T.A. *Genomes 3.* Abingdon: Garland Science
- Lodish H.et al., *Molecular Cell Biology*, New York: W.H. Freeman and Company
- Russell P.J. *i Genetics* Harlow: Pearson Education
- Watson J. et al. *Molecular Biology of the Gene*. San Francisco, California: Pearson/ Benjamin Cummings
- Brown, T.A *Genetics – A Molecular Approach*. London: Chapman and Hall.
- Robinson, T.R. *Genetics for Dummies*. New York: Wiley
- Turner et al. *Molecular Biology – Instant Notes*. New York: Wiley.

Further reading must include the following academic journals*:*

Trends in Genetics

Nature Genetics

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MODULE SPECIFICATION

Part 1: Information			
Module Title	Research Skills and Laboratory Project		
Module Code	USSKNN-30-2	Level	2
For implementation from	September 2020		
UWE Credit Rating	30	ECTS Credit Rating	15
Faculty	Health and Applied Sciences	Field	Applied Sciences
Department	Applied Sciences		
Contributes towards	FdSc Biological Laboratory Sciences, compulsory		
Module type:	Standard		
Pre-requisites	None		
Excluded Combinations	None		
Co- requisites	None		
Module Entry requirements	None		

Part 2: Description

This module will cover the following topics within the molecular biology field:

- Designing of appropriate experimental procedures to carry out a research project in a biological laboratory. The design of experiments will include choosing the most appropriate methodologies, the use of controls, preparing materials and collection of data.
- Planning and management of a research project will be considered, including health and safety, ethics and use of genetically modified organisms. Discussions will include how to carry out risk assessments for biological sciences work, both in the laboratory and in the field. The use of MSDS information and COSHH forms for risk assessment will be included.
- Determination and selection of the appropriate statistical analysis will be employed to interpret the data and carry out appropriate analysis correctly.
- Practical approaches, which will enable students to set up experiments, collect appropriate data, analyse and evaluate data appropriately and present the study to a wider audience.

This module aims to deliver specialist knowledge through taught lectures, seminars and practical sessions to promote application of knowledge acquired and analytical and problem-solving skills.

Independent learning includes hours engaged with essential reading around the subject, project preparation and completion.

Generic Graduate Skill	*Specific strand (eg presentation) - Optional*	**Introduced**	**Developed**	**Evidenced**
1. Communication	Written and oral communication [A, B], team work [A, B]	☐	☐	☒
2. Professionalism	Reflective practice, team work, lab work [A, B]	☐	☐	☒
3. Critical Thinking	Project development, evaluation and reflective practice [A, B]	☐	☐	☒
4. Digital Fluency	Digital assignments [A, B]	☐	☐	☒
5. Innovative and Enterprising	Project development, evaluation and reflective practice [A, B]	☐	☒	☐
6. Forward Looking	Project development, evaluation and reflective practice [A, B]	☐	☒	☐

7. Emotional Intelligence	Project development, team work and reflective practice [A, B]	☐	☒	☐
8. Globally Engaged		☐	☐	☐

Part 3: Assessment: Strategy and Details

The assessment strategy has been designed to support and enhance the development of subject-based knowledge and practical skills, whilst ensuring that the learning outcomes are achieved.

Component A is a *presentation*. Students will work in a team to produce a group research proposal. Students will then individually present their group research proposal as a presentation demonstrating their understanding of the research process. The presentation will be followed by a 5 minute Q&A session.

Component B will consist of the students undertaking an agreed research project utilising the skills that they have developed during the course. Students will present and evaluate their findings as a project report. The project will contain an appendix containing project material which could be disseminated to a range of audiences.

Opportunities for formative feedback are built into teaching and practical sessions, through discussion, analysis of collected data and evaluation of current research.

Identify final timetabled piece of assessment (component and element)	**Component B**

% weighting between components A and B (Standard modules only)	**A:**	**B:**
	30	**70**

First Sit

Component A (controlled conditions) **Description of each element**	**Element weighting** **(as % of component)**
1. Presentation (15 minutes)	100

Component B **Description of each element**	**Element weighting** **(as % of component)**
1. Research Project (3500 words)	100

Resit (further attendance at taught classes is not required)	
Component A (controlled conditions) **Description of each element**	**Element weighting** **(as % of component)**
1. Presentation (15 minutes)	100
Component B **Description of each element**	**Element weighting** **(as % of component)**
1. Research Project (3500 words)	100

Part 4: Learning Outcomes & KIS Data

Learning Outcomes	On successful completion of this module students will be able to: • Design appropriate experimental procedures to carry out work in a biological laboratory or as field work (A and B) • Evaluate and discuss research methodology within the biosciences field (B) • Apply effective laboratory and /or field procedures to gather a set of data and apply appropriate statistical analysis models (B) • Disseminate the outcome of studies in a variety of ways to a range of audiences (A and B) • Evaluate and critically discuss previously published research (B) • Develop team-work skills in a research environment, including respecting the views of others, identification of collective goals and negotiating (A and B)
Key Information Sets Information (KIS) Contact Hours	

Key Information Set - Module data

Number of credits for this module 30

Hours to be allocated	Scheduled learning and teaching study hours	Independent study hours	Placement study hours	Allocated Hours
300	90	210	0	300

<table>
<tr>
<td>Total Assessment</td>
<td>
The table below indicates as a percentage the total assessment of the module which constitutes a;

Written Exam: Unseen or open book written exam

Coursework: Written assignment or essay, report, dissertation, portfolio, project or in class test

Practical Exam: Oral Assessment and/or presentation, practical skills assessment, practical exam (i.e. an exam determining mastery of a technique)
<table>
<tr><td colspan="3">Total assessment of the module:</td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="4">Written exam assessment percentage</td><td>0%</td></tr>
<tr><td colspan="4">Coursework assessment percentage</td><td>70%</td></tr>
<tr><td colspan="4">Practical exam assessment percentage</td><td>30%</td></tr>
<tr><td></td><td></td><td></td><td></td><td>100%</td></tr>
</table>
</td>
</tr>
<tr>
<td>Reading List</td>
<td>
The following books are recommended as it covers most of the module material at an appropriate level:

• Jones, A., Reed, R., & Weyers, J. Practical Skills in Biology. Harlow: Pearson Education.
• Brown, J. K. (2011) Biotechnology: a laboratory skills course. Bio-Rad Laboratories, Inc: California.

Extensive notes will be provided via blackboard on the scientific topics. Links to useful and credible websites will also be provided.

The students are also advised to consult the basic scientific texts in UCW, Frenchay and Glenside libraries, of which the following is a representative sample:

The latest editions of:

• Jones, A. Reed, R., Weyers, J. Practical Skills in Biology. Harlow: Pearson Education
• Lodish et al. Molecular Cell Biology. New York: W.H. Freeman.
• Alberts et al. Molecular Biology of the Cell. Abingdon: Garland Publishing.

• Plus appropriate use of relevant primary and review journals and www based resources. These will include:
Trends in… series of journals
Current Opinion… series of journals
Frontiers in… series of journals
Nature
Nature Reviews
PLoS
</td>
</tr>
</table>

MODULE SPECIFICATION

Part 1: Information			
Module Title	Ecology and Ecosystems		
Module Code	USSKNL-30-2	Level	2
For implementation from	September 2020		
UWE Credit Rating	30	ECTS Credit Rating	15
Faculty	Health and Applied Sciences	Field	Applied Sciences
Department	Applied Sciences		
Contributes towards	FdSc Biological Laboratory Sciences, compulsory		
Module type:	Standard		
Pre-requisites	None		
Excluded Combinations	None		
Co- requisites	None		
Module Entry requirements	None		

Part 2: Description

Ecology and Ecosystems focuses on population dynamics including population regulation, community ecology and succession, global biodiversity and the factors affecting its distribution.

- *Population and evolutionary genetics:*

Gene flow in populations and restrictions to flow that cause isolation and speciation. Hardy-Weinberg principle, genetic drift and mutations. Adaptation of species to changes in environmental conditions.

- *Human impacts on ecosystems:*

General causes of habitat destruction and habitat disturbance including pollution, climate change, introduced species and over-exploitation. In addition, habitat management, restoration and creation and ecological impacts of introduced species are also covered.

- *Ecosystem protection:*

Concepts of wildlife protection through land protection; types of land protection at a national and international level; the effectiveness of current land protection policy in the UK and internationally.

Generic Graduate Skill	*Specific strand (eg presentation) - Optional*	**Introduced**	**Developed**	**Evidenced**
1. Communication	Written communication [A, B1, B2], team work [A]	☐	☒	☒
2. Professionalism	Reflective practice [A]	☐	☒	☒
3. Critical Thinking	Literature review [B2]	☐	☒	☒
4. Digital Fluency	Digital assignments [B1, B2]	☐	☒	☒
5. Innovative and Enterprising	Via class discussion, debate	☐	☒	☐
6. Forward Looking	Via class discussion, debate	☐	☒	☐
7. Emotional Intelligence	Via class discussion, debate	☐	☒	☐
8. Globally Engaged	Human impacts on ecosystems [B2]	☐	☒	☒

Part 3: Assessment: Strategy and Details

The assessment is designed to test students' breadth and depth of understanding of ecological principles. In addition, the assessment provides a framework for students to extend their knowledge and practical skills in relation to human activities and ecosystem protection through an independent research project.

Component A consists of a production of a notebook of fieldwork research of specific habitats / communities, supported by individual reflection and critical appraisal.

Component B1 consists of an independent research project (2500 words) to explore human impacts on a specified ecosystem. This is an opportunity for students to research scientific findings and generate an in-depth analysis of impact of a specific environmental concern (e.g. microplastics in marine ecosystems).

Component B2 involves the creation of an educational leaflet (double sided A4) covering the area of population and evolutionary genetics.

Students have the opportunity to informally discuss their work with an academic member of staff during timetabled feed forward sessions, or remotely using Blackboard, e-mail, skype, or other social media vehicles.

Identify final timetabled piece of assessment (component and element)	**B1**

% weighting between components A and B (Standard modules only)	**A:**	**B:**
	30	**70**

First Sit	
Component A (controlled conditions) **Description of each element**	**Element weighting** **(as % of component)**
1. Fieldwork notebook	100
Component B **Description of each element**	**Element weighting** **(as % of component)**
1. Investigative report (2500 words)	70
2. Educational leaflet for lay audience (double sided A4)	30
Resit (further attendance at taught classes is not required)	

Component A (controlled conditions) **Description of each element**	**Element weighting** **(as % of component)**
1. Fieldwork notebook	100
Component B **Description of each element**	**Element weighting** **(as % of component)**
1. Investigative report (2500 words)	70
2. Educational leaflet for lay audience (double sided A4)	30

Part 4: Learning Outcomes & KIS Data

Learning Outcomes	On successful completion of this module students will be able to: • Apply ecological principles to the study of population dynamics (A) • Communicate how population genetics influences adaptations and evolution (B2) • Evaluate the relationship between human activities and ecosystems (B1) • Evaluate the effectiveness of current ecosystem management and protection policies in conserving wildlife and ecosystem function (B1) • Obtain, record and interpret data using appropriate techniques in the field and the access and analysis of secondary data sources (A) •
Key Information Sets Information (KIS) Contact Hours	

Key Information Set - Module data

Number of credits for this module 30

Hours to be allocated	Scheduled learning and teaching study hours	Independent study hours	Placement study hours	Allocated Hours
300	90	210	0	300

The table below indicates as a percentage the total assessment of the module which constitutes a;

Written Exam: Unseen or open book written exam

Coursework: Written assignment or essay, report, dissertation, portfolio, project or in class test

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Practical Exam: Oral Assessment and/or presentation, practical skills assessment, practical exam (i.e. an exam determining mastery of a technique)

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<tr><td colspan="4">Total assessment of the module:</td><td></td></tr>
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<tr><td></td><td></td><td></td><td></td><td>100%</td></tr>
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</td>
</tr>
<tr>
<td>Reading List</td>
<td>

The following book is recommended as it covers most of the module material at an appropriate level.

- Begon, M., Harper, J.L. & Townsend, C.R. Ecology: individuals, populations and communities. Blackwell Scientific Publications, Cambridge.

Extensive notes will be provided via blackboard on the scientific topics. Links to useful and credible websites will also be provided.

The students are also advised to consult the basic scientific texts in UCW, Frenchay and Glenside libraries, of which the following is a representative sample:

The latest editions of:

- Ausden, M. *Habitat management for conservation: a handbook of techniques*. Oxford University Press, Oxford.
- Falk, D.A. *Foundations of Restoration Ecology. Island Press*, Washington DC.
- Krebs, C.J. *Ecology: the experimental analysis of distribution and abundance*. Benjamin Cummings, San Francisco.
- Newman, E.I. *Applied Ecology and Environmental Management*, Blackwell Scientific.
- Sutherland, W.J. & Hill, D.A. *Managing habitats for conservation*. Cambridge University Press.
- Townsend, C.R., Harper, J.L. & Begon, M. *Essentials of ecology*. Blackwell Science
- Wheater, C.P., Bell, J.R. & Cook, P.A. *Practical Field Ecology*. Jon Wiley & Sons, *e-book available on line*.

<u>Further reading must include the following academic journals</u>:
Journal of Applied Ecology
Biological Conservation
British Wildlife
Trends in Ecology and Evolution

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</table>

MODULE SPECIFICATION

Part 1: Information			
Module Title	Human Health and Diseases		
Module Code	USSKNJ-15-2	Level	2
For implementation from	September 2020		
UWE Credit Rating	15	ECTS Credit Rating	7.5
Faculty	Health and Applied Sciences	Field	Applied Sciences
Department	Applied Sciences		
Contributes towards	FdSc Biological Laboratory Sciences, compulsory		
Module type:	Standard		
Pre-requisites	None		
Excluded Combinations	None		
Co- requisites	None		
Module Entry requirements	None		

Part 2: Description

This module introduces students to the human health, infectious diseases and immune response.

Immunology: introduction to the immune system, autoimmune disorders and immunodeficiency.

Infectious diseases: infectious agents and diseases they cause.

Epidemiology: artificial control methods of various infectious diseases.

Inherited health conditions: diseases caused by autosomal, allosomal, mitochondrial and polygenic disorders.

Exercise, nutrition and health: the role of nutrition and physical activity in the cause, prevention and treatment of chronic human disease including those of the cardiovascular and endocrine systems.

Generic Graduate Skill	*Specific strand (eg presentation) - Optional*	Introduced	Developed	Evidenced
1. Communication	Written and oral communication [A, B]	☐	☐	☒
2. Professionalism	Group poster presentation [A]	☐	☒	☐
3. Critical Thinking	Case study analysis and evaluation [A]	☐	☐	☒
4. Digital Fluency	Digital assignment [A, B]	☐	☐	☒
5. Innovative and Enterprising		☐	☐	☐
6. Forward Looking	Evaluation of current developments in infectious diseases [B]	☒	☐	☐
7. Emotional Intelligence	Group work and negotiating [A]	☒	☐	☐
8. Globally Engaged	Evaluation of current developments in infectious diseases [B]	☒	☐	☐

Part 3: Assessment: Strategy and Details

The assessment is designed to test students' breadth and depth of understanding of human immune response, relationship between a lifestyle and health and relationship between infectious agents and artificial control methods.

A poster presentation (component A) based on two case studies will enable students to deepen their understanding of key health conditions and disorders. Students will also develop their ability to analyse and evaluate factors affecting human health.

The coursework consists (component B) of an essay (2500 words) to explore infectious agents, diseases they cause, artificial control methods and epidemiology of those infectious diseases. This is an opportunity for students to research scientific findings and generate an in-depth analysis of epidemiology specific infectious diseases and evaluation of current artificial control methods. This assessment will test a range of learning outcomes and will provide a valuable learning experience through applying knowledge and supporting this through the published literature.

Students have the opportunity to informally discuss their work with an academic member of staff during timetabled feed forward sessions.

Identify final timetabled piece of assessment (component and element)	**Component B**		
% weighting between components A and B (Standard modules only)		**A:**	**B**:
		50	**50**
First Sit			

Component A (controlled conditions) **Description of each element**	**Element weighting** **(as % of component)**
1. Poster presentation	100
Component B **Description of each element**	**Element weighting** **(as % of component)**
1. Essay (2500 words)	100
Resit (further attendance at taught classes is not required)	
Component A (controlled conditions) **Description of each element**	**Element weighting** **(as % of component)**
1. Poster Presentation	100
Component B **Description of each element**	**Element weighting** **(as % of component)**
1. Essay (2500 words)	100

Part 4: Learning Outcomes & KIS Data

Learning Outcomes	On successful completion of this module students will be able to: • Discuss the structure and function of the human immune system (B) • Investigate pathogenesis of various infectious agents and evaluate epidemiology of the selected infectious diseases (B) • Analyse and discuss the impact of hereditary disorders (A) • Evaluate the role of exercise and nutrition in the maintenance of a healthy state (A) • Analyse, evaluate and present published data by employing effective science communication skills (A)
Key Information Sets Information (KIS)	**Key Information Set - Module data** *Number of credits for this module* 15

		Hours to be allocated	Scheduled teaching study hours	Independent learning and study hours	Placement study hours	Allocated Hours	
Contact Hours	The ta	150	45	105	0	150	h

	constit **Writte** ole below indicates as a percentage the total **Cours** assessment of the m utes a; test **Practic n Exam**: Unseen or open book written exam practica **ework**: Written assignment or essay, report, dissertation, portfolio **al Exam**: Oral Assessment and/or presentation, practical skills a l exam (i.e. an exam determining mastery of a technique)	odule whic , project or ssessment,	in class

Total Assessment	Total assessment of the module:				
	Written exam assessment percentage				0%
	Coursework assessment percentage				50%
	Practical exam assessment percentage				50%
					100 %

Reading List

The following books are recommended as it covers most of the module material at an appropriate level.

- Cohen, B.J. and Hull, K.L. (2015) Memmler's The Human Body in Health and Disease. 13th Ed. Philadelphia: Wolters Kluwer.
- Waugh, A and Grant, A. (2014) Ross and Wilson Anatomy and Physiology in Health and Illness. 14th Ed. Churchill Livingstone: London.

Extensive notes will be provided via blackboard on the scientific topics. Links to useful and credible websites will also be provided.
The students are also advised to consult the basic scientific texts in UCW, Frenchay and Glenside libraries, of which the following is a representative sample:

- Ahmed,N. Dawson,M. Smith, C. & Wood, E. (2007) *Biology of Disease*. New York: Taylor & Francis.
- Lakhani, S.R., Dilly,S.A., Finlayson, C.J. & Dogan, A. *Basic Pathology.* London: Hodder Arnold.
- Phillips,J., Murray,P. & Kirk, P. *The Biology of Disease.* Oxford: Blackwell Science.

The following journals may also include relevant material and are available through the UWE Library:

- PNAS
- Nature
- Microbiology
- Infection, Disease and Health

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First CAP Approval Date	17/5/2018			
Revision CAP Approval Date Update this row each time a change goes to CAP		Version	1	APDG approval 26/1/18
	06/11/2019		2	

MODULE SPECIFICATION

Part 1: Information			
Module Title	Work based learning		
Module Code	USSKNK-15-2	Level	2
For implementation from	September 2020		
UWE Credit Rating	15	ECTS Credit Rating	7.5
Faculty	Health and Applied Sciences	Field	Applied Sciences
Department	Applied Sciences		
Contributes towards	FdSc Biological Laboratory Sciences, compulsory		
Module type:	Standard		
Pre-requisites	None		
Excluded Combinations	None		
Co- requisites	None		
Module Entry requirements	None		

Part 2: Description

This module introduces and develops essential skills employed in the effective acquisition and use of information encountered in laboratory practices or science-related settings. The module is based around the development of those skills which, once acquired, are applied and further developed in the workplace. Additionally, the knowledge and skills should assist learners in their future careers as these skills are increasingly demanded by employers. The module focuses on four essential areas; communication (oral, textual and graphical); application of number; information technology (data search and analysis skills); and basic laboratory management skills.

Students will be expected to source their own work-based learning opportunities, with support from the course team and HE careers adviser. Through this, students will develop skills of CV and application writing, and professional presentation of themselves as suitable candidates for employment. Where work placement opportunities are limited for any reason, staff will use their industry contacts to help place a student, or provide simulated briefs based on 'real-world' scenarios, to be carried out within the UCW laboratory setting.

Student are required to present their findings from their work-based learning in both written and verbal formats.

Generic Graduate Skill	*Specific strand (eg presentation) - Optional*	Introduced	Developed	Evidenced
1. Communication	Written communication and presentation [A, B]	☐	☐	☒
2. Professionalism	Work experience; work placement [A, B]	☐	☐	☒
3. Critical Thinking	Reflective practice [A, B]	☐	☐	☒
4. Digital Fluency	Digital assignment [A, B]	☐	☐	☒
5. Innovative and Enterprising	Work experience; work placement [A, B]	☐	☒	☐
6. Forward Looking	Work experience; work placement [A, B]	☐	☒	☐
7. Emotional Intelligence	Work experience; work placement [A, B]	☐	☐	☒
8. Globally Engaged		☐	☐	☐

Part 3: Assessment: Strategy and Details

The assessment strategy has been designed to support and enhance the development of subject-based knowledge and practical skills, whilst ensuring that the learning outcomes are achieved.

Component A is a 20 minute oral presentation based on a written review of the students work place experiences. This assessment will provide students with an opportunity to demonstrate both their ability to reflect on their own experiences and to develop science communication skills.

Component B is a reflective evaluation of the work-placement, undertaken by students that includes skills analysis, smart targets for personal development and personal development planning as part of an overall evaluation of their development needs for their chosen future career.

All work is marked in line with the Faculty of Health and Applied Sciences generic assessment.

Identify final timetabled piece of assessment (component and element)	**Component A**	
	A:	**B:**

% weighting between components A and B (Standard modules only)	**40**	**60**
First Sit		

Component A (controlled conditions) **Description of each element**	**Element weighting** **(as % of component)**
1. Oral presentation (20 min)	100
Component B **Description of each element**	**Element weighting** **(as % of component)**
1. Portfolio (2000 words)	100
Resit (further attendance at taught classes is not required)	
Component A (controlled conditions) **Description of each element**	**Element weighting** **(as % of component)**
1. Oral presentation (20 min)	100
Component B **Description of each element**	**Element weighting** **(as % of component)**
1. Portfolio (2000 words)	100

Part 4: Learning Outcomes & KIS Data

Learning Outcomes	On successful completion of this module students will be able to: • Reflectively evaluate work practices in a scientific laboratory or setting (A) • Evaluate personal attributes, transferrable skills and emotional intelligence essential for employability and personal development (B) • Employ strategies for personal and career development (B) • Communicate understanding of scientific workplace needs (A)
Key Information Sets Information (KIS)	

Key Information Set - Module data

Number of credits for this module 15

Hours to be allocated	Scheduled Placement hours	Independent learning and study hours	study hours teaching study hours	Allocated Hours
150	45	105	0	150

Contact Hours

The ta ɔle below indicates as a percentage the total assessment of the ule which consti mod utes a;
t

ı **Exam**: Unseen or open book written exam
Writteework: Written assignment or essay, report, dissertation, portfolio, roject or in class
Cours ɔ
test ssment,
Practic al Exam: Oral Assessment and/or presentation, practical skills asse
practic l exam (i.e. an exam determining mastery of a technique)

Total assessment of the module:

Written exam assessment percentage	0%
	50

Total Assessment	Coursework assessment percentage	%
	Practical exam assessment percentage	50 %
		100%
Reading List	The following book is recommended as it covers most of the module material at an appropriate level: • Fanthome, C. (2004) *Work Placements: A Survival Guide for Students*. Basingstoke: Palgrave Macmillan. Further reading will be provided at the beginning of the module.	

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	06/11/2019		2	

Learning Outcomes

Part 3: Learning Outcomes

The award route provides opportunities for students to develop and demonstrate knowledge and understanding, qualities, skills and other attributes in the following areas:

A. Knowledge and Understanding (subject specific)

A successful graduate will be able to:

1. Demonstrate knowledge and understanding of practical laboratory techniques, including data collection, analysis, interpretation and evaluation of the results, testing of hypotheses.
2. Place the experimental work in context and to suggest lines of further investigation.
3. Understand and explain biological phenomena at a variety of levels (from molecular to ecological systems) and how evolutionary theory is relevant to biological processes.
4. Access and evaluate bioscience information from a variety of sources and to communicate the principles both orally and in writing in a way that is organised and topical, and recognises the limits of current hypotheses.
5. Understand and appreciate ethical issues within biosciences and how they underpin professional integrity and standards.
6. Understand the impact on society of advances in the biosciences.
7. Appreciate the complexity and diversity of life processes through the study of organisms, their molecular, cellular and physiological processes, their genetics and evolution, and the interrelationships between them and their environment.

8. Have the ability to give a clear and accurate account of a subject, organise arguments in a sophisticated way and engage in debate and dialogue both with specialists and non-specialists, using appropriate scientific language.

B. Intellectual Skills

A successful graduate will be able to:

1. Recognise and apply subject-specific theories, paradigms, concepts or principles.
2. Seek and analyse, synthesise and summarise information critically, including published research or reports.
3. Obtain and integrate several lines of subject-specific evidence to formulate and test hypotheses.
4. Apply subject knowledge and understanding to address familiar and unfamiliar problems.
5. Synthesising knowledge as an independent learner and a manager of self.
6. Recognise the moral and ethical issues of investigations and appreciate the need for ethical standards and professional codes of conduct.
7. Plan, execute and present a piece of hypothesis-driven work within a supported framework in which qualities such as time management, problem solving, and independence are evident.

C. Subject/Professional/Practical Skills (subject specific)

Biosciences graduates will be able to:

1. Design, plan, conduct and report on investigations, which may involve primary or secondary data (for example from a survey database)
2. Obtain, record, collate and analyse data using appropriate techniques in the field and/or laboratory, working individually or in a group, as is most appropriate for the subject under study
3. Undertake laboratory investigations of living systems in a responsible, safe and ethical manner.
4. Explain and justify the impact of investigations on the environment, on the organisms or subjects under investigation, and on other stakeholders.

5. Use and interpret a variety of sources of information: textual, numerical, verbal, graphical
6. Carry out sample selection; record and analyse data in the field and/or the laboratory; ensure validity, accuracy, calibration, precision, replicability and highlight uncertainty and possible bias during collection.
7. Interpret and present data, using appropriate qualitative and quantitative techniques, statistical programmes, spreadsheets and programmes for presenting data visually.

D. Transferable Skills and other attributes (generic)

A successful graduate will be able to:

1. Analyse, synthesise and summarise information critically from a variety of sources using appropriate referencing methods.
2. Understand the importance of academic and research integrity.
3. Receive, respond to and problem solve using a variety of methods and sources of information: textual, numerical, verbal, graphical
4. Identify individual and collective goals and responsibilities and perform in a manner appropriate to these roles, in particular those being developed through practical, laboratory and/or field studies
5. Work effectively within teams.
6. Develop the skills necessary for independent lifelong learning (for example working independently, time management, organisational, enterprise and knowledge transfer skills)

	Learning Outcomes:	Module No: *Laboratory skills and data analysis for biosciences (30 Credits)*	Module No: *Core Chemistry (15 credits)*	Module No: *Practical Cell Biology and Biochemistry (30 Credits)*	Module No: *Microbiology (15 credits)*	[illegible]	Module No: *Environmental Sciences (15 credits)*	Module No: *Work based Learning (15 credits)*	Module No: *Ecology and Eco-systems (30 credits)*	Module No: *Research skills and Laboratory project (30 credits)*	Module No: *Practical applications of molecular biology and biotechnology (30 credits)*	Module No: *Infectious diseases, immunity and human health (15 credits)*	
	A) Knowledge and understanding of:												

	Demonstrate knowledge and understanding of practical laboratory techniques, including data collection, analysis, interpretation and evaluation of the results, testing of hypotheses.	√	√	√	√	√	√	√	√	√	√	√	
	Place the experimental work in context and to suggest lines of further investigation	√								√	√	√	
	Understand and explain biological phenomena at a variety of levels (from molecular to ecological systems) and how evolutionary theory is relevant to biological processes			√	√	√	√		√	√	√	√	
	Access and evaluate bioscience information from a variety of sources and to communicate the principles both orally and in writing in a way that is organised and topical, and recognises the limits of current hypotheses	√	√	√	√	√	√	√	√	√	√	√	

	Understand and appreciate ethical issues within biosciences and how they underpin professional integrity and standards									√	√	√	
	Understand the impact on society of advances in the biosciences									√	√	√	
	Appreciate the complexity and diversity of life processes through the study of organisms, their molecular, cellular and physiological processes, their genetics and evolution, and the interrelationships between them and their environment		√	√	√	√							
	Have the ability to give a clear and accurate account of a subject, organise arguments in a sophisticated way and engage in debate and dialogue both with specialists and non-	√	√	√	√	√	√	√	√	√	√	√	

	specialists, using appropriate scientific language.												
	(B) Intellectual Skills												
	Recognise and apply subject-specific theories, paradigms, concepts or principles.	√	√	√	√	√	√	√	√	√	√	√	
	Seek and analyse, synthesise and summarise information critically, including published research or reports.	√	√	√	√	√	√	√	√	√	√	√	
	Obtain and integrate several lines of subject-specific evidence to formulate and test hypotheses.	√	√	√	√	√	√	√	√	√	√	√	
	Apply subject knowledge and understanding to address familiar and unfamiliar problems.	√	√	√	√	√	√	√	√	√	√	√	

	Synthesising knowledge as an independent learner and a manager of self.	√	√	√	√	√	√	√	√	√	√	√	
	Recognise the moral and ethical issues of investigations and appreciate the need for ethical standards and professional codes of conduct									√	√	√	
	Plan, execute and present a piece of hypothesis-driven work within a supported framework in which qualities such as time management, problem solving and independence are evident.	√						√	√	√	√		
	(C) Subject/Professional/Practical Skills												
	Design, plan, conduct and report on investigations, which may involve primary or secondary data (for example from a survey database)	√	√	√	√					√	√	√	

	Obtain, record, collate and analyse data using appropriate techniques in the field and/or laboratory, working individually or in a group, as is most appropriate for the subject under study	√	√	√	√					√	√	√	
	Undertake laboratory investigations of living systems in a responsible, safe and ethical manner.	√	√	√	√					√	√	√	
	Explain and justify the impact of investigations on the environment, on the organisms or subjects under investigation, and on other stakeholders.	√	√	√	√					√	√	√	
	Use and interpret a variety of sources of information: textual, numerical, verbal, graphical	√	√	√	√	√	√	√	√	√	√	√	
	Carry out sample selection; record and analyse data in the field and/or the laboratory; ensure validity, accuracy, calibration, precision, replicability and	√	√	√	√		√			√	√	√	

	highlight uncertainty and possible bias during collection.												
	Interpret and present data, using appropriate qualitative and quantitative techniques, statistical programmes, spreadsheets and programmes for presenting data visually.	√	√	√	√	√	√	√	√	√	√	√	
	(D) Transferable skills and other attributes												
	Analyse, synthesise and summarise information critically from a variety of sources using appropriate referencing methods.	√	√	√	√	√	√	√	√	√	√	√	
	Understand the importance of academic and research integrity	√	√	√	√	√	√	√	√	√	√	√	
	Receive, respond to and problem solve using a variety of methods and sources of	√	√	√	√	√	√	√	√	√	√	√	

	information: textual, numerical, verbal, graphical												
	Identify individual and collective goals and responsibilities and perform in a manner appropriate to these roles, in particular those being developed through practical, laboratory and/or field studies	√	√	√	√	√	√	√	√	√	√	√	
	Work effectively within teams	√		√				√			√		
	Develop the skills necessary for independent lifelong learning.	√	√	√	√	√	√	√	√	√	√	√	

Appendix 2 - Marking Criteria

Marks will be allocated using the following qualitative guidelines

The Marking Scale:

In determining the overall grade for a piece of work, markers will assess the work against the QAA descriptors for the level. Specific criteria are linked to the academic content and learning outcomes of the module.

The full range of marks should be used as appropriate:

100 - 90	89 - 80	79 - 70	69 - 60	59 - 50	49 - 40	39 - 30	29 - 20	19 - 10	9 - 0

Level is described by the QAA "The framework for higher education qualifications in England, Wales and Northern Ireland" (August 2008)

Glossary:

For help with understanding some of the terminology in this guidance please use the my skills resource accessed through the UWE library website (assessment & feedback). Resources on this site include interactive online tools www.uwe.ac.uk/library/resources/hub/

		Indicative Qualities
100 - 90%	**Exceptional**	*Exceptional in knowledge and comprehension and creativity. Original and imaginative argument and critical evaluation. Exemplary.*
89 - 80%	**Outstanding**	*Clear and sophisticated argument and evaluation. Evidence of insightful analysis in most areas; convincing synthesis of a range of appropriate sources. Excellent referencing*
79 - 70%	**Excellent**	*Clear and well presented argument. Evidence of clear understanding of relevant issues and ideas. Sound evidence of evaluation and knowledge. Logical development of ideas presented. Evidence of having read widely and appropriately. Very good referencing.*
69 - 60%	**Very Good**	*Comprehensive in content and reasonably well organised argument but evaluation and development of ideas could be improved. Demonstrates*

		ability to evaluate but somewhat limited in depth discussion. Clear evidence of appropriate reading. Good referencing.
59 - 50%	**Good**	*Competent grasp of main issues showing ability to begin to evaluate and interpret information, but could be strengthened. Some analysis evident and begins to develop argument but tends to be descriptive; Balance between description and evaluation could be improved. Some evidence of reading but limited and not always appropriately referenced.*
49 - 40%	**Pass**	*Meets the relevant learning outcomes but mostly descriptive. Some basic interpretation and evaluation but not very well developed. May be prone to unsubstantiated assertion. Some misunderstanding of key principles and concepts. Evidence of some structure but not always well sequenced. Evidence of some reading.*
39 - 35%	**Marginal Fail**	*Some strengths, but overall not reaching the minimum pass standard due to some key omissions in presentation, argument or structure. Lines of argument need further development. Content not always relevant. Limited evidence of reading.*
34 - 30%	**A Limited Piece of Work**	*Some positive elements but missing some essential aspects. For example, may be lacking in focus and structure. Likely to have limited discussion with some lack of relevance. Presentation may need to be improved. Likely to show insufficient evidence of reading;*
29 - 20%	**A Limited Piece of Work**	*Some positive elements but generally unsatisfactory with some irrelevant or incorrect material. Lack of discussion. Likely to show insufficient evidence of reading;*
19 - 10%	**A Very Limited Piece of Work**	*Significant deficiencies; Likely to have insufficient, irrelevant or incorrect material. Likely to have very poor structure; no discussion.*
9 - 0%	**Exceptionally Limited Piece of Work**	*Insufficient material presented. No evidence of sufficient preparation.* *Zero is reserved for failure to attempt an answer.*

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Appendix 3 – Policies and Procedures

Policies relating to HE Students can be found on Microsoft Teams at:

https://teams.microsoft.com/_#/ClassNotebook/unknown?threadId=19:b45bd6e851aa4e5abb2c48f3b0d9c2b2@thread.skype&ctx=channel

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