

MODULE SPECIFICATION

| Part 1: Information | | | |
|---------------------------|---|--------------------|------------------|
| Module Title | Practical Cell Biology and Biochemistry | | |
| Module Code | USSKNG-30-1 | Level | 1 |
| For implementation from | September 2017 | | |
| 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 | | |
| Module type: | Standard | | |
| Pre-requisites | None | | |
| Excluded Combinations | None | | |
| Co- requisites | None | | |
| Module Entry requirements | None | | |

| Part 2: Description |
|---|
| <p><u>This module will cover the following topics:</u></p> <p>Biological chemistry: structure and function of biological macromolecules.</p> <p>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.</p> <p>Key techniques in cell Biology, biochemistry and genetics: microscopy, PCR, analysis of DNA and protein by gel electrophoresis, simple protein purification, enzyme assays and kinetics.</p> <p>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.</p> <p>Studying genes: genes and gene expression: transcription, RNA processing and translation. DNA replication. Role of mutations. PCR and gene cloning.</p> <p>Inheriting genes. Mendelian genetics. Gene inheritance patterns in humans and molecular approaches to diagnosing genetic disease.</p> <p>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. Student learning will be further supported through both UCW and UWE E-Learning Environment, with provision of materials and activities to guide independent study.</p> <p>Independent learning includes hours engaged with essential reading, case study preparation, assignment preparation and completion etc. These sessions constitute an average time per level as indicated in the table below.</p> |

| Part 3: Assessment | | |
|---|--|------------------------|
| <p>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.</p> <p>Component A is an oral exam (30 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.</p> <p>The coursework is comprised of a 1500 word essay and a practical portfolio of laboratory reports. This assessment will provide a valuable practical learning experience, as well as independent research of published literature and development of academic writing style.</p> <p>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 exam through a revision and exam preparation session prior to the exam and through the extensive support materials supplied through the E-Learning Environment.</p> <p>All work is marked in line with the UWE generic assessment criteria and conforms to university policies for the setting, collection, marking and return of student work. Assessments are described in the module handbook that is supplied at the start of module.</p> | | |
| Identify final timetabled piece of assessment (component and element) | Component B, element 2 | |
| % weighting between components A and B (Standard modules only) | A: 40 | B: 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. Practical portfolio | 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. Data interpretation exercise | 70 | |

| Part 4: Teaching and Learning Methods | | | | | | | | | | | |
|--|--|---------------------------------|---|------------------------------------|-----------------------|----------------------------------|-----|--------------------------------------|-----|---|------|
| Learning Outcomes | <p>On successful completion of this module students will be able to:</p> <ul style="list-style-type: none"> 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] understand how the DNA & RNA structure function and describe the basic features of gene structure and expression [A1, B1, B2] explain how genetic material can be altered by natural and artificial means [B1, B2] describe the modes of inheritance of characteristics [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) | <p style="text-align: center;"><u>Key Information Set - Module data</u></p> <p style="text-align: right;"><i>Number of credits for this module</i> 30</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 10%;">Hours to be allocated</th> <th style="width: 20%;">Scheduled learning and teaching study hours</th> <th style="width: 20%;">Independent study hours</th> <th style="width: 20%;">Placement study hours</th> <th style="width: 10%;">Allocated Hours</th> </tr> </thead> <tbody> <tr> <td>300</td> <td>96</td> <td>204</td> <td>0</td> <td>300</td> </tr> </tbody> </table> <p style="text-align: right;"></p> | Hours to be allocated | Scheduled learning and teaching study hours | Independent study hours | Placement study hours | Allocated Hours | 300 | 96 | 204 | 0 | 300 |
| Hours to be allocated | Scheduled learning and teaching study hours | Independent study hours | Placement study hours | Allocated Hours | | | | | | | |
| 300 | 96 | 204 | 0 | 300 | | | | | | | |
| Contact Hours | | | | | | | | | | | |
| Total Assessment | <p>The table below indicates as a percentage the total assessment of the module which constitutes a;</p> <p>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)</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th colspan="2">Total assessment of the module:</th> </tr> </thead> <tbody> <tr> <td>Written exam assessment percentage</td> <td>0%</td> </tr> <tr> <td>Coursework assessment percentage</td> <td>50%</td> </tr> <tr> <td>Practical exam assessment percentage</td> <td>50%</td> </tr> <tr> <td></td> <td>100%</td> </tr> </tbody> </table> | Total assessment of the module: | | Written exam assessment percentage | 0% | Coursework assessment percentage | 50% | Practical exam assessment percentage | 50% | | 100% |
| Total assessment of the module: | | | | | | | | | | | |
| Written exam assessment percentage | 0% | | | | | | | | | | |
| Coursework assessment percentage | 50% | | | | | | | | | | |
| Practical exam assessment percentage | 50% | | | | | | | | | | |
| | 100% | | | | | | | | | | |
| Reading List | <p>The following book is recommended as it covers most of the module material at an appropriate level.</p> <ul style="list-style-type: none"> Alberts, B. Bray, D. Hopkin, K. Johnson, A.D. Lewis, J. Raff, M. Roberts, K. and Walter, P. (2013) <i>Essential Cell Biology</i>, London: Garland Science. | | | | | | | | | | |

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:

- Russell, P.J., *Genetics. iGenetics A Molecular Approach*, USA: Pearson Ed. Inc.
- Robinson, T.R., *Genetics for Dummies*. USA: Wiley.
- Lodish, H. et al., *Molecular Cell Biology*, New York: W.H. Freeman and Company.
- Alberts, B. et al., *Molecular Biology of the Cell*, London: Garland Science.
- Nelson, D.L. and Cox, M.M., *Principles of Biochemistry*, New York: W.H. Freeman.
- Berg, J.M., Tymoczko, J.L. and Stryer, L., *Biochemistry*, New York: W.H. Freeman.

Further reading must include the following academic journals:

Trends in Genetics

Nature Genetics

Nature Reviews

PLoS

PNAS

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| First SUVP Approval Date | 17/5/2018 | | | |
| Revision Approval Date | | Version | 1 | APDG approval 26/1/18 |