1. **Title of the module**

BIOS3020 (BI302) - Molecular and Cellular Biology

1. **School or partner institution which will be responsible for management of the module**

Biosciences

1. **The level of the module (Level 4, Level 5, Level 6 or Level 7)**

Level 4

1. **The number of credits and the ECTS value which the module represents**

15 credits (7.5 ECTS credits)

1. **Which term(s) the module is to be taught in (or other teaching pattern)**

Autumn

1. **Prerequisite and co-requisite modules**

Prerequisite:

A level Biology or equivalent

Or

BIOS3050 Fundamental Human Biology

1. **The programmes of study to which the module contributes**

BSc Biochemistry and related programmes

BSc Biomedical Science and related programmes

BSc Biology and related programmes

BEng Bioengineering and related programmes

1. **The intended subject specific learning outcomes.  
   On successfully completing the module students will be able to:**

8.1 demonstrate a basic understanding of cell structure, organisation and division, cellular control by genetic material and the range of techniques used in investigating cell and molecular biology.

8.2 demonstrate a basic understanding of, and practical competence, in research methods in cell and molecular biology and of problem-solving in cell and molecular biology assessed by the multiple choice question format.

1. **The intended generic learning outcomes.  
   On successfully completing the module students will be able to:**

9.1 Students will have developed and demonstrated time management and organisational skills

9.2 Students will have developed skills at interpreting and retrieving information (knowledge management) and be able to demonstrate this in examinations

9.3 Students will have developed, and be able to apply, problem-solving skills

9.4 Students will have developed, and be able to demonstrate in examinations, written communication skills

1. **A synopsis of the curriculum**

This module addresses key themes and experimental techniques in molecular and cellular illustrated by examples from a range of microbes animals and plants . It covers basic cell structure, and organisation including organelles and their functions, cytoskeleton, cell cycle control and cell division. The control of all living processes by genetic mechanisms is introduced and an opportunity to handle and manipulate genetic material provided in the laboratory. Monitoring of students' knowledge and progress will be provided by a multi-choice test and the laboratory report, with feedback

Functional Geography of Cells: Introduction to cell organisation, variety and cell membranes. Molecular traffic in cells. Organelles involved in energy and metabolism. Eukaryotic cell cycle. Chromosome structure & cell division. Meiosis and recombination. Cytoskeleton.

Molecular biology: The structure and function of genetic material. Chromosomes, chromatin structure, mutations, DNA replication, DNA repair and recombination, Basic mechanisms of transcription, mRNA processing and translation.

Techniques in molecular and cellular biology: Methods in cell Biology - light and electron microscopy; cell culture, fractionation and protein isolation/electrophoresis; antibodies, radiolabelling. Gene Cloning – vectors, enzymes, ligation, transformation, screening; hybridisation, probes and blots, PCR, DNA sequencing. Applications of recombinant DNA technology.

Laboratory: PCR amplification of DNA and gel analysis.

1. **Reading list (Indicative list, current at time of publication. Reading lists will be published annually)**

Alberts B, et al. Essential Cell Biology, 5th Edition, Garland Science Pub., 2019 ISBN:

978-0393680393

1. **Learning and teaching methods**

Contact Hours 27

Self Study: 123

Total hours 150

1. **Assessment methods**
   1. Main assessment methods

Laboratory report – 1500-2000 words (20%)

MCQ assessments – 40 questions (20%)

2hr Examination 60%

13.2 Reassessment methods

like for like

1. **Map of module learning outcomes (sections 8 & 9) to learning and teaching methods (section12) and methods of assessment (section 13)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Module learning outcome** | *8.1* | *8.2* | *9.1* | *9.2* | *9.3* | *9.4* |
| **Learning/ teaching method** |  |  |  |  |  |  |
| **Private Study** | **x** | **x** | **x** | **x** | **x** |  |
| *lectures* | **x** | **x** | **x** |  | **x** |  |
| *Pre-lab and lab* | **x** | **x** | **x** |  | **x** |  |
|  |  |  |  |  |  |  |
| **Assessment method** |  |  |  |  |  |  |
| *MCQ test* | **x** | **x** | **x** | **x** | **x** |  |
| *Lab report* | **x** | **x** | **x** |  | **x** | **x** |
| *Examination* | **x** | **x** | **x** | **x** | **x** | **x** |
|  |  |  |  |  |  |  |

1. **Inclusive module design**

The School recognises and has embedded the expectations of current equality legislation, by ensuring that the module is as accessible as possible by design. Additional alternative arrangements for students with Inclusive Learning Plans (ILPs)/declared disabilities will be made on an individual basis, in consultation with the relevant policies and support services.

The inclusive practices in the guidance (see Annex B Appendix A) have been considered in order to support all students in the following areas:

a) Accessible resources and curriculum

b) Learning, teaching and assessment methods

1. **Campus(es) or centre(s) where module will be delivered**

Canterbury

1. **Internationalisation**

Biosciences is an international discipline. This module presents subject-specific knowledge, research approaches and techniques, generated, developed and refined by scientists around the world. Mastery of the learning outcomes will equip students to apply the theories and techniques of the module in a wide range of international contexts. In compiling the reading list, consideration has been given to the range of texts that are available internationally and a selection has been identified to complement the delivery of the material. The School of Biosciences is an international community of students and staff. Group activities e.g. in practicals, tutorials, workshops and self-study will naturally draw on the international make-up of the student body; the module teaching team includes members with international experience of teaching and research collaboration.

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**Revision record – all revisions must be recorded in the grid and full details of the change retained in the appropriate committee records.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Date approved | Major/minor revision | Start date of the delivery of revised version | Section revised | Impacts PLOs (Q6&7 cover sheet) |
| 01/05/18 | Major | September 2018 | 8, 10 | No |
| 05/12/18 | Minor | September 2019 | 10 | No |
| 20/01/20 | Minor | September 2020 | 11, 13 | No |

Revised FSO Feb 2020