1. **Title of the module**

BIOS6380 (BI638) - Bioinformatics and Genomics

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 6

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

15 credits (7.5 ECTS)

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

Autumn

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

Prerequisite:

BIOS3000 Introduction to Biochemistry

BIOS5320 Skills for Bioscientists 2

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

BSc Biology and related programmes

BSc Biochemistry and related programmes

BSc Biomedical Sciences and related programmes

BSc Biomedical Engineering and related programmes

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

8.1 Use DNA/protein databases, sequence searching methods, generate multiple sequence alignments, analyse residue conservation.

8.2 Use bioinformatics methods to analyse and model protein structure, function and interactions with small ligands and with other proteins.

8.3Understand genomics approaches including – genome sequencing, comparative and functional genomics.

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

9.1. Bioinformatics skills for data retrieval and analysis across the biosciences’ disciplines. Data retrieval/analysis are generic to all numerate subjects.

9.2. Transferable skills including written communication (technical reports and a coursework project).

9.3. Analytical skills including analysis and presentation of data, writing of reports and a project (coursework).

1. **A synopsis of the curriculum**

**Bioinformatics Data sources & Sequence analysis:** Databases and data availability. Using sequence data for analysis – sequence searching methods, multiple sequence alignments, residue conservation, Protein domains and families.

**Protein Bioinformatics Methods**: Protein structure and function prediction. Prediction of binding sites/interfaces with small ligands and with other proteins. Bioinformatics analyses using protein data.

**Genomics:** An introduction to the analysis of genomic data, primarily focussing on the data available from genome sequencing – how it can be used to study genetic variants and compare genomes (i.e. comparative and functional genomics).

1. **Reading list (Indicative list, current at time of publication. Reading lists will be published annually)**
   1. Lesk A, *Introduction to Bioinformatics,* 5th Edition, Oxford University Press, 2019
   2. Lesk A, *Introduction to Genomics*, 3rd Edition, OUP, 2017

Additionally selected peer-reviewed research and review papers will be recommended.

1. **Learning and teaching methods**

Total contact hours: 32

Private study hours: 118

Total study hours: 150

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

Workshop (20% - short answer questions)

Assignment (80% - 2000 words)

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*** | ***8.3*** | ***9.1*** | ***9.2*** | ***9.3*** |
| **Learning/ teaching method** |  |  |  |  |  |  |
| Private Study | **x** | **x** | **x** | **x** |  |  |
| *Lectures* | **x** | **x** | **x** |  |  |  |
| *Computer workshops* | **x** | **x** | **x** | **x** | **x** | **x** |
| **Assessment method** |  |  |  |  |  |  |
| *Assessed practical: workshop* | **x** | **x** | **x** | **x** | **x** |  |
| *Main assignment* | **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 and 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 practical classes, 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.

**FACULTIES SUPPORT OFFICE USE ONLY**

**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) |
| 18 Dec 18 | Major | September 2019 | 9, 13, 14, 17 | no |
| 27/11/19 | Minor | Sep 2020 | 13 | no |

Revised FSO Feb 2020