1. KentVision Code and title of the module

CHEM3910 – Computing Skills for Modern Data Analysis

## Division and School/Department or partner institution which will be responsible for management of the module

Division of Natural Sciences (Chemistry and Forensic Science)

## The level of the module (Level 4, Level 5, Level 6 or Level 7)

Level 4

## The number of credits and the ECTS value which the module represents

15 credits (7.5 ECTS)

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

Spring

## Prerequisite and co-requisite modules and/or any module restrictions

None

## The course(s) of study to which the module contributes

Compulsory for the following courses:

BSc(Hons) Chemistry

BSc(Hons) Chemistry with a Professional Placement

BSc(Hons) Chemistry with a Year Abroad

BSc(Hons) Chemistry with a Foundation Year

MChem Chemistry

Not available as an elective module.

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

8.1 Demonstrate a systematic understanding of how computers work according to human instruction;

8.2 Demonstrate knowledge and understanding of computing languages and principles, and their use for diverse applications;

8.3 Demonstrate an ability to solve problems in mathematics and chemistry using appropriate mathematical tools. This includes the ability to use computational methods for the practical application of theory and to use information technology and data-processing skills to search for, assess and interpret chemical information and data.

8.4 Demonstrate an ability to use mathematical techniques and analysis to model physical behaviour using computer programming.

8.5 Demonstrate competent use of appropriate C&IT packages/systems for the analysis of data and the retrieval of appropriate information.

8.6 Demonstrate an ability to present and interpret information graphically using a computer.

8.7 Demonstrate an ability to make use of appropriate texts, research-based materials or other learning resources as part of managing their own learning, and develop simple algorithms.

8.8 Demonstrate an ability to recognise and analyse problems and plan strategies for their solution by the evaluation, interpretation and synthesis of scientific information and data. Ability to adapt and apply methodology above to solve advanced and unfamiliar problems found in computer programming.

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

9.1 Demonstrate programming skills - in the context of both problems with well-defined solutions and open-ended problems. Numeracy is subsumed within this area;

9.2 Demonstrate analytical skills – associated with the need to pay attention to detail and to develop an ability to manipulate precise and intricate ideas, to construct logical arguments and to use technical language correctly;

9.3 Demonstrate personal and interpersonal skills – the ability to work independently, to use initiative, to organise oneself to meet deadlines and to interact constructively with other people within a professional environment. Including the ability to communicate and interact with professionals from other disciplines;

9.4 Demonstrate problem-solving skills, relating to qualitative and quantitative information, extending to situations where evaluations have to be made on the basis of limited information, including the demonstration of self-direction and originality;

9.5 Demonstrate information-retrieval skills, in relation to primary and secondary information sources, including information retrieval through on-line computer searches.

## A synopsis of the curriculum

As scientific methods and instruments advance, computers become ever more important in data analysis and acquisition. This module introduces to the concept of programming languages and their uses, and presents a practically minded course on using simple programming to solve problems relevant to chemistry, and to automate the analysis and presentation of data.

## Reading list

## The University is committed to ensuring that core reading materials are in accessible electronic format in line with the Kent Inclusive Practices.

## The most up to date reading list for each module can be found on the university's [reading list pages](https://kent.rl.talis.com/index.html).

## Contact Hours

Private Study: 114

Contact Hours: 36

Total: 150

## Assessment methods

13.1 Main assessment methods

* Coding Assignment 1 (3 hours) – 10%
* Coding Assignment 2 (3 hours) – 10%
* Coding Assignment 3 (6 hours) – 20%
* Coding Assignment 4 (6 hours) – 20%
* Coding Assignment 5 (6 hours) – 20%
* Coding Assignment 6 (6 hours) – 20%

13.2 Reassessment methods

* 100% by Coursework

## Map of module learning outcomes (sections 8 & 9) to learning and teaching methods (section 12) and methods of assessment (section 13)

**Module learning outcomes against learning and teaching methods:**

| **Module learning outcome** | 8.1 | 8.2 | 8.3 | 8.4 | 8.5 | 8.6 | 8.7 | 8.8 | 9.1 | 9.2 | 9.3 | 9.4 | 9.5 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Private Study | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** |
| Lectures | **X** | **X** | **X** | **X** |  |  |  |  |  | **X** | **X** | **X** | **X** |
| Computer Laboratory | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** |

**Module learning outcomes against assessment methods:**

| **Module learning outcome** | 8.1 | 8.2 | 8.3 | 8.4 | 8.5 | 8.6 | 8.7 | 8.8 | 9.1 | 9.2 | 9.3 | 9.4 | 9.5 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Coding Assignments | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** |

## Inclusive module design

The Division 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

## Campus(es) or centre(s) where module will be delivered

Canterbury

## Internationalisation

Science is an international discipline with widely applicable international resonance. This module presents subject-specific knowledge generated, developed, and refined by scientists around the world. Mastery of the learning outcomes will equip students to apply the knowledge in a wide range of international contexts and these will be addressed in making the content relevant to current global issues. The Division of Natural Sciences is an international community of students and staff and group activities and teaching will provide a platform for internationally-focussed discussion.

**DIVISIONAL USE ONLY**

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

| Date approved | New/Major/minor revision | Start date of delivery of (revised) version | Section revised  (if applicable) | Impacts PLOs (Q6&7 cover sheet) |
| --- | --- | --- | --- | --- |
| 9 Dec 2021 | Minor | Sept 2022 | 12 | No |
|  |  |  |  |  |