1. KentVision Code and title of the module

CHEM3630 – Physical Chemistry 1 - Energy and Rates

## 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 Understand core and foundation chemical, physical, and biological concepts, terminology, theory, units, conventions, and laboratory practice and methods in relation to the chemical sciences;

8.2 Demonstrate elementary knowledge and understanding of essential facts, concepts, principles and theories relating to chemistry and to apply this knowledge and understanding to the solution of qualitative and quantitative problems;

8.3 Recognise and analyse problems and plan strategies for their solution by the evaluation, interpretation and synthesis of scientific information and data;

8.4 Understand the importance of observational and instrumental monitoring of physiochemical events and changes, and the systematic and reliable documentation of the above;

8.5 Collate, interpret and explain the significance and underlying theory of experimental data to fundamental chemical principles.

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

9.1 Demonstrate a range of appropriate communication skills;

9.2 Build on generic skills to undertake further training of a professional nature;

9.3 Use problem-solving skills to interpret qualitative and quantitative information, extending to situations where evaluations have to be made on the basis of limited information;

9.4 Demonstrate numeracy and computational skills, including such aspects as order-of-magnitude estimations, and correct use of units;

9.5 Make use of Information-retrieval skills, in relation to primary and secondary information sources, including information retrieval through on-line computer searches;

9.6 Use information-technology skills such as word-processing and spreadsheet programmes, data-logging and storage, internet communication, etc.

9.7 Demonstrate time-management and organisational skills, as evidenced by the ability to plan and implement efficient and effective modes of working. Self-management and organisational skills with the capacity to support life-long learning;

9.8 Develop study skills needed for continuing professional development and professional employment.

## A synopsis of the curriculum

This module discusses the key ideas of thermodynamics and kinetics in a chemical context. It shows how the universe may be understood in terms of the flow of energy from high to low, and how this allows not only an understanding of what transformations are possible but also how fast they will occur. These essential physical principles are then applied to real world phenomena such as batteries, showing that even the most fundamental theories have direct and important applications in the modern world.

## 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: 124

Contact Hours: 26

Total: 150

## Assessment methods

13.1 Main assessment methods

* Online Quiz 1 (1 hour) – 5%
* Online Quiz 2 (1 hour) – 5%
* Assessed Worksheet 1 (4 hours) – 15%
* Assessed Worksheet 2 (4 hours) – 15%
* Examination (2 hours) – 60%

13.2 Reassessment methods

* 100% Examination

## 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 | 9.1 | 9.2 | 9.3 | 9.4 | 9.5 | 9.6 | 9.7 | 9.8 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Private Study | **x** | **x** | **x** | **x** | **x** |  | **x** | **x** | **x** | **x** | **x** | **x** | **x** |
| Workshop | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |
| Lectures | **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 | 9.1 | 9.2 | 9.3 | 9.4 | 9.5 | 9.6 | 9.7 | 9.8 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Online Quizzes | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |
| Assessed Worksheets  | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |
| Examination | **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 | 12-14 | No |
|  |  |  |  |  |