1. KentVision Code and title of the module

CHEM5700 – Materials Chemistry 1 – Structure and Properties

## 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 5

## 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 knowledge and critical understanding of the terminology, conventions, and core concepts in solid state and materials chemistry including structure, packing, and thermodynamic descriptions of solid state and materials systems, such as phase diagrams;

8.2 Demonstrate knowledge and critical understanding of the principles, terminology, and core concepts of the physical, mechanical, and electronic properties of solid state materials and systems;

8.3 Demonstrate knowledge and critical understanding of the terminology, conventions, and core concepts of how structure and defects determine physical properties of solid state materials and systems;

8.4 Demonstrate knowledge and critical understanding of the principles and methods for the characterisation and study of solid state systems such as diffraction methods.

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

9.1 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;

9.2 Demonstrate time-management and organisational skills, as evidenced by the ability to plan and implement efficient and effective modes of working;

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

9.4 Demonstrate study skills needed for continuing professional development and professional employment.

## A synopsis of the curriculum

The functional properties of solids, which are widely used for their ability to conduct electricity and ions, is determined by their structure on the atomic scale. An understanding of this is vital to the development of new materials, including those required to enable the clean energy technologies of tomorrow. This module will provide you with an understanding of the structures of solids and how they’re determined. We will also explore the properties of materials, including electronic and ionic conductivity, and the role solids play in energy-related technologies.

## 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% by 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 | 9.1 | 9.2 | 9.3 | 9.4 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Private Study | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** |
| Workshop | **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 | 9.1 | 9.2 | 9.3 | 9.4 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Online Quizzes | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** |
| Assessed Worksheet | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** |
| Examination | **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) |
| --- | --- | --- | --- | --- |
| 17 Dec 2021 | Major | September 2022 | 9, 13-14 | No |
|  |  |  |  |  |