1. **Title of the module**

CHEM3200 (CH320) Chemical Reactions

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

Physical Sciences

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)

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

Autumn and Spring

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

None

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

BSc and MChem Chemistry programmes

1. **The intended subject specific learning outcomes.  
   On successfully completing the module students will be able to:**
2. Demonstrate knowledge and understanding of core and foundation scientific chemical concepts, terminology, theory, and conventions.
3. Demonstrate knowledge and understanding of areas of chemistry including properties of chemical elements, functional groups, physiochemical principles, and synthetic pathways.
4. Demonstrate knowledge and understanding of essential facts, concepts, principles and theories relating to the subject and to apply such knowledge and understanding to the solution of qualitative and quantitative problems.
5. Recognise and analyse problems and plan strategies for their solution by the evaluation, interpretation and synthesis of scientific information and data.
6. Demonstrate skills in the safe handling of chemical materials, taking into account their physical and chemical properties, including any specific hazards associated with their use and to risk assess such hazards.
7. Demonstrate skills required for carrying out documented standard laboratory procedures involved in synthetic and analytical work in relation to organic and inorganic systems. Skills in observational and instrumental monitoring of physiochemical events and changes. The systematic and reliable documentation of the above. Operation of standard analytical instruments employed in the chemical sciences.
8. Collate, interpret and explain the significance and underlying theory of experimental data, including an assessment of limits of accuracy.
9. **The intended generic learning outcomes.  
   On successfully completing the module students will be able to:**
10. Demonstrate generic skills needed for students to undertake further training of a professional nature.
11. Demonstrate knowledge and understanding of numeracy and computational skills, including such aspects as error analysis, order-of-magnitude estimations, correct use of units and modes of data presentation.
12. Demonstrate study skills needed for continuing professional development and professional employment.
13. **A synopsis of the curriculum**

This module will introduce you to core scientific chemical concepts including chemical equations and stoichiometry, kinetics and activation energies for reactions in solutions and acid and base chemistry. You will learn the theoretical background and terminology needed to understand these core concepts, along with the mathematical skills required by a practicing chemist. Hands-on laboratory experimentation is a key component of this module, teaching you the basic methodology used for understanding the physical chemistry of reactions, with a particular focus on their kinetics and thermodynamics. As part of this, you will be taught how to effectively use fundamental laboratory equipment and instrumentation (Lab component).

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

* P. Atkins, Elements of Physical Chemistry, 2017, OUP
* J. Kotz, Chemistry and Chemical Reactivity, 2015, Cengage
* P. Monk, Mathematics for Chemistry, 2010, OUP

1. **Learning and teaching methods**

Total contact hours: 66

Private study hours: 84

Total study hours: 150

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

Maths Assignment (1 hour, 3.33%)

Maths in course test (45 min, 6.67%)

Chemistry Assignment 1 (1 hour, 5%)

Chemistry Assignment 2 (1 hour, 5%)

Lab Report 1 (2-4 pages 1.66%)

Lab Report 2 (2-4 pages 1.66%)

Lab Report 3 (2-4 pages 1.66%)

Lab Report 4 (2-4 pages 1.66%)

Lab Report 5 (2-4 pages 1.67%)

Lab Report 6 (2-4 pages 1.67%)

Lab Report 7 (2-4 pages 1.67%)

Lab Report 8 (2-4 pages 1.67%)

Lab Report 9 (2-4 pages 1.67%)

Lab Report 10 (2-4 pages 1.67%)

Lab Report 11 (2-4 pages 1.67%)

Lab Report 12 (2-4 pages 1.67%)

Examination (2 hours, 60%)

The Maths assignment and the maths in-course test form a compulsory sub-element that must be passed to pass the module.

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* | *8.4* | *8.5* | *8.6* | *8.7* | *9.1* | *9.2* | *9.3* |
| **Learning/ teaching method** |  |  |  |  |  |  |  |  |  |  |
| *Private Study* | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |
| *Lectures* | **x** | **x** | **x** | **x** |  |  |  |  | **x** | **x** |
| *Laboratory* |  |  |  |  | **x** | **x** | **x** | **x** | **x** | **x** |
| **Assessment method** |  |  |  |  |  |  |  |  |  |  |
| *Maths Assignment* | **x** | **x** | **x** | **x** |  |  |  |  | **x** |  |
| *Maths in-course test* | **x** | **x** | **x** | **x** |  |  |  |  | **x** |  |
| *Chemistry Assignments* | **x** | **x** | **x** | **x** |  |  |  |  | **x** | **x** |
| *Lab reports* |  |  |  |  | **x** | **x** | **x** | **x** | **x** | **x** |
| *Examination* | **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**

Chemistry is an international subject with chemical laws discovered and techniques developed and refined by Chemists across the globe. Mastery of the subject-specific learning outcomes, will equip students to apply the theories and techniques of this module in a wide range of international contexts. The module team is drawn from the School of Physical Sciences, which includes many members of staff with international experience of teaching and research collaboration. In compiling the reading list, consideration has been given to the range of texts that are available internationally and a selection of texts has been identified to complement the delivery of the material. The support SPS provides to its students is also internationally attuned given our international student body.

**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) |
| 28/02/19 | Major | September 2019 | 8,11,13,14 | no |
|  |  |  |  |  |