1. **Title of the module**

CHEM3820 (CH382) - Chemical Skills

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**

30 credits (15 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**

Prerequisite:

CHEM3080 Molecules Matter & Energy (and appropriate A level qualifications or equivalent)

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

BSc Chemistry

MChem Chemistry

BSc Chemistry with Year in Industry

This is not available as a wild module.

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

Have:

8.1 The knowledge and skills base to allow progression to further studies in the areas of chemistry and forensic science, with a sense of enthusiasm for chemistry and its applications. (Programme learning outcomes: A1, A3, B1, B2, B3, C1, C2, C3)

8.2 Acquired and developed key skills, concepts, theories and practice which underpin practical chemistry problem solving and data presentation methods pertaining to scientific results dissemination. (Programme learning outcomes B1, B2, B3)

8.3 Acquired and developed necessary practical laboratory skills, problem-solving skills and work-related safety skills, including chemical handling, scientific data presentation and standard laboratory procedures. (Programme learning outcomes C1, C2, C3)

8.4 The ability to recognise trends within groups and across periods of the periodic table and describe chemical and physical properties of elements within those groups. Developed knowledge and skills in the identification of behavioural periodic and group trends of the elements. (Programme learning outcomes A1, A3, B1)

8.5 The ability to explain, with the aid of diagrams and using software tools, typical structures of common compounds. (Programme learning outcomes B3)

8.6 Developed numerical and mathematical skills, critical for the study of chemistry and forensic science. (Programme learning outcomes B1, B3)

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

Have:

9.1 A transferable skills set including the use of information and communication technology. (Programme Learning Outcomes: D1, D2, D3, D4, D7, D8, D9).

1. **A synopsis of the curriculum**

In this module you will be introduced to the key concept of periodicity and how, through a deeper knowledge of the periodic table, chemists are able to understand and predict the chemical properties, reactivity and compounds formed by the elements. You will also be introduced to redox chemistry, which plays a key role in the reactivity of the elements and the forms in which they are found.

This module also has a significant focus on experimental chemistry. You will therefore complete a set of laboratory practicals, enabling you to develop the laboratory skills and knowledge to work safely in an experimental environment and carry out fundamental organic and analytical chemistry procedures, including basic spectroscopy. This will be supplemented by teaching you the essentials of laboratory safety awareness and the skills needed to write scientific reports, including ways to clearly present data arising from experiments. To enable you to achieve this you will learn, through examples of physical science applications, the basic mathematics required to understand, plot and analyse graphical information, including differentiation and integration. This will be supported by lessons in how to use simple computer programs for drawing molecular and crystal structures and carry out basic calculations on the energy levels of chemical systems (Lab component).

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

* Burrows, Holman, Parsons, Pilling and Price, Chemistry3, Oxford University Press, 2009
* Chang, Chemistry, McGraw-Hill, 1998
* Monk, Mathematics for Chemistry, Oxford University Press, 2006
* Higher Education Academy Physical Sciences Center, Quantitative Skills in Forensic Science: <http://www.physsci.ltsn.ac.uk/Resources/DevelopmentProjectsReport.aspx?id=204>
* Langford, Dean, Reed, Holmes, Weyers, and Jones, Practical Skills in Forensic Science, Pearson/Prentice Hall, 2005
* Inorganic Chemistry, Shriver & Atkins, OUP 1999, ISBN: 978-019850331-8
* Inorganic Chemistry, Housecroft & Sharpe, Prentice Hall 2001, ISBN: 978-058231080-3

1. **Learning and teaching methods**

Total contact hours: 82

Private study hours: 218

Total study hours: 300

1. **Assessment methods**

Data presentation methods and Communication skills (3 hours, 5.4%)

Periodicity and lab safety in course test (40 mins, 15.6%)

Molecular graphics and pc skills (3.5 hours, 7.2%)

Library quiz (1.5 hours, 1.8%)

Fundamental labs (12 hours, 13.2%)

Analytical labs (11 hours, 13.2%)

Maths in course test (40 mins, 3.6%)

Examination (2 hours, 40%)

It is compulsory to pass Fundamental labs (12 hours, 12%) and Analytical labs (11 hours, 12%) overall.

It is compulsory to pass Maths in-course test (40 mins, 6%).

It is compulsory to pass Examination (2 hours, 40%)

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* | *9.1* |
| **Learning/ teaching method** |  |  |  |  |  |  |  |
| Private Study | **X** | **X** | **X** | **X** | **X** | **X** | **X** |
| Lectures | **X** | **X** | **X** | **X** |  | **X** | **X** |
| Laboratory classes | **X** |  | **X** |  |  |  | **X** |
| Terminal sessions |  | **X** |  |  | **X** | **X** | **X** |
| **Assessment method** |  |  |  |  |  |  |  |
| Exam | **X** |  |  | **X** | **X** |  |  |
| Moodle tests | **X** |  | **X** |  |  |  | **X** |
| Lab reports | **X** | **X** | **X** |  | **X** |  | **X** |
| Assignments | **X** | **X** | **X** |  | **X** |  | **X** |
| Class test | **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

b) Learning, teaching and assessment methods

1. **Campus(es) or centre(s) where module will be delivered**

Canterbury

1. **Internationalisation**

Science is an international subject with physical laws discovered and techniques developed and refined by scientists 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) |
| 10/07/2019 | Minor | September 2019 | 8, 13, 14 |  |
|  |  |  |  |  |