1. **Title of the module**

LABS412 Basic Analytical Chemistry

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

Centre for Higher and Degree Apprenticeships (CHDA)

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)**

Flexible delivery model

Autumn and/or Spring and/or Summer

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

N/A

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

FdSc and BSc (Hons) in Applied Chemical Sciences

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

8.1 Demonstrate an understanding of key concepts in Analytical Chemistry.

8.2 Solve quantitative problems relating to these concepts.

8.3 Suggest appropriate methods to solve analytical tasks.

8.4 Describe the principles behind analytical separations.

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

9.1 Demonstrate the development of practical/technical skills

9.2 Analyse, evaluate and correctly interpret data

9.3 Communicate and present data effectively

9.4 Obtain and use information from a variety of sources as part of self-directed learning.

9.5 Manage their time and use their organisation skills within the context of self-directed learning.

1. **A synopsis of the curriculum**

Chemical calculations: SI units, mass, moles, volume, density, concentration (%w/v, %v/v, M, N), dilution factor, yield, calibration.

Statistics: basic statistical methods for analysis, accuracy and precision, significant figures, experimental errors, sampling and sample preparation

Stoichiometry and the relation to classical analytical techniques such as titrimetry and gravimetry.

Titrations (acid-base, redox, complexometric, iodometric and potentiometric), indicators, gravimetric and electrochemical analysis.

Qualitative analysis - chemical tests for inorganic and organic compounds, flame tests, melting points and elemental analysis

Qualitative and quantitative methods (classical vs instrumental methods).

Basics of analytical separations - Selected techniques: solvent extraction principles; selectivity based on pH control and complexation; methods of extraction; chromatography: principles and applications of partition and adsorption as applied to separation of samples using paper and thin layer chromatography.

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

Aylward, G. & Findlay, T. (2008) SI Chemical Data, 6th Edition. Wiley.

Harris, D.C. (2011) Quantitative Chemical Analysis (7th Ed.). W H Freeman.

Wilbraham, A.C., et al. (2008) Chemistry. Pearson Prentice Hall.

Johll, M.E. (2012) Investigating Chemistry, 3rd ed. W H Freeman. New Age Science.

S. M. Khopkar (2008) Basic Concepts of Analytical Chemistry. 3rd ed.

1. **Learning and teaching methods**

Blended Distance learning:

Contact Hours: 120

Private Study Hours: 30

Total Study Hours: 150

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

Portfolio 30% - composed of individual assignments where topics are applied to the workplace

Assignments 40% - 2 Assignments (20% each)

Exam 30% - composed of MCQs

The weighted average for both the overall coursework and the overall exam component must be of a pass standard.

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 | 9.1 | 9.2 | 9.3 | 9.4 | 9.5 |
| **Learning/ teaching method** |  |  |  |  |  |  |  |  |  |
| **Teaching** | **x** | **x** | **x** | **x** |  | **x** | **x** | **x** | **x** |
| Private Study | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |
| Work-based experience | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |
| **Assessment method** |  |  |  |  |  |  |  |  |  |
| Portfolio | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |
| Assignments | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |
| MCQ | **x** | **x** | **x** | **x** |  | **x** | **x** | **x** | **x** |

1. **Inclusive module design**

The School/Collaborative Partner *(delete as applicable)* 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**

Blended distance learning – delivered from Medway and Canterbury campus

1. **Internationalisation**

International vocation is an important part of Applied Chemical Science. The intended learning outcomes 8.1, and 8.4, for this module cover key universal principles and concepts of basic analytical chemistry and therefore are core components of Applied Chemical Science worldwide. The syllabus also covers solving analytical tasks and quantitative problems, which are fundamental in chemistry-based research. Furthermore, Basic Analytical Chemistry is a core component of the Pharmaceutic R & D industry and this module reflects international aspects.

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**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 delivery of revised version | Section revised | Impacts PLOs (Q6&7 cover sheet) |
| 05/10/20 | Minor | Sep 20 | 13 | No |
|  |  |  |  |  |