1. **Title of the module**

LABS611 Analytical Chemistry for Laboratory Scientists

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 6

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**

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 knowledge of core and foundation scientific physical, biological and chemical concepts, terminology, theory, units, conventions, and laboratory methods in relation to the chemical and forensic sciences.

8.2 Appreciate the areas of chemistry including analytical chemistry, including those applied to forensic analysis.

8.3 Demonstrate knowledge and understanding of essential facts, concepts, principles and theories relating to analytical chemistry and to apply this knowledge and understanding to the solution of qualitative and quantitive problems.

8.4 Recognise and analyse problems involving analytical chemistry and plan strategies for their solution by the evaluation, interpretation and synthesis of scientific information and data by a variety of computational methods.

8.5 Collate, interpret and explain the significance and underlying theory of experimental data, including an assessment of limits of accuracy.

8.6 Interpret data derived from laboratory observations and measurements in terms of their underlying significance and the theory underpinning them.

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

9.1 Show the necessary skills needed to undertake further training of a professional nature.

9.2 Solve problems relating to qualitative and quantitative information, extending to situations where evaluations have to be made on the basis of limited information.

9.3 Demonstrate numeracy and computational skills, including such aspects as error analysis, order-of-magnitude estimations, correct use of units and modes of data presentation.

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

9.5 Demonstrate the study skills needed for continuing professional development and professional employment.

1. **A synopsis of the curriculum**

The aim of the module is to increase the fundamental understanding of a range of physical techniques currently used in analytical chemistry, and to explore the potential applications of these techniques. These topics include:-

* Atomic emission/absorption spectrometry
* High-performance liquid chromatography (HPLC)
* Capillary zone electrophoresis (CZE)
* Ion chromatography
* Mass spectrometry and associated chromatographic techniques:
* Electro-analytical chemistry
* Optical microscopy
* Electron microscopy

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

G. D. Christian, (2003) Analytical Chemistry, 6th Ed. New York: Chichester, Wiley.

D. A. Skoog, D. M. West, F. J. Holler and S. R. (2014) Crouch, Fundamentals of Analytical Chemistry: Student Solutions Manual, 9th Ed. Australia: Brooks/Cole.

K. A. Rubinson and J. F. Rubinson, (2000) Contemporary Instrumental Analysis, 1st Ed. Upper Saddle River (New Jersey): Prentice-Hall.

E. de Hoffman, J. J. Charette and V. Stroobant, (2001) Mass Spectrometry — Principles and Applications, 2nd Ed. Chichester: Wiley.

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

Coursework Assignment (2000 words) - 25%

2 hour Examination – 75%

The pass mark for each individual assessment is 40%.  All assessments must be passed in order to pass the module

13.2 Reassessment methods

Like for Like

1. ***Module learning outcomes (sections 8 & 9) to learning and teaching methods (sectin12) and methods of assessment (section 13)***

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Module learning outcome** | 8.1 | 8.2 | 8.3 | 8.4 | 8.5 | 8.6 | 9.1 | 9.2 | 9.3 | 9.4 | 9.5 |
| **Learning/ teaching method** |  |  |  |  |  |  |  |  |  |  |  |
| Online material/ Recorded Lectures | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |  | **x** |
| Private Study | **x** | **x** | **x** | **x** | **x** | **x** |  | **x** | **x** | **x** | **x** |
| **Assessment method** |  |  |  |  |  |  |  |  |  |  |  |
| Coursework | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |
| Examination | **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. With regards to the intended learning outcomes, in particular 8.1, 8.2, and 8.8, the target learning outcomes within this module are applicable worldwide as part of the universal principles used in the Pharmaceutics R&D Industry. With regard to subject content, the material within the syllabus is applied to a range of international contexts.

**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.**

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| Date approved | Major/minor revision | Start date of delivery of revised version | Section revised | Impacts PLOs (Q6&7 cover sheet) |
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