1. **Title of the module**

LABS509 Separation Science

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 5

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 a good understanding of general methods for separation of components from a mixture.

8.2 Explain the key principles of extraction methods such as liquid-liquid extraction, solid-liquid extraction and solid phase extraction.

8.3 Demonstrate knowledge of the principles of chromatography, especially as applied to high performance liquid chromatography (HPLC).

8.4 Describe chromatographic techniques, such as thin layer chromatography, gas chromatography and HPLC.

8.5 Demonstrate a good understanding of different modes of separation.

8.6 Interpret any given chromatogram and derive all relevant information from it.

8.7 Predict the behaviour of molecules in separations and suggest ways in which separations may be improved.

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**

Introduction to separation science.

Extraction methods

* Principles
* Equipment
* Applications
* Advantages and disadvantages.

Chromatographic theory.

Chromatographic techniques – principles, equipment and applications

* Thin layer chromatography (TLC)
* Gas Chromatography (GC)
* High Performance Liquid Chromatography

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

Snyder, Lloyd R; Dolan, John W; Kirkland, J. J. (2010) Introduction to modern liquid chromatography , 3rd Ed. Wiley.

Watson, D.G. (2005) Pharmaceutical Analysis: A textbook for pharmacy students. Livingstone.

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

2 assignments 20% (10% each)

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

2 hr Exam 50% - composed of MCQs (20%) and standard-length questions (30%)

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 (sectin2) 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 | 8.7 | 9.1 | 9.2 | 9.3 | 9.4 | 9.5 |
| **Learning/ teaching method** |  |  |  |  |  |  |  |  |  |  |  |  |
| **Teaching** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |  | **x** | **x** | **x** | **x** |
| Private Study | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |
| Work-based experience |  |  |  |  |  |  |  | **x** | **x** | **x** | **x** | **x** |
| **Assessment method** |  |  |  |  |  |  |  |  |  |  |  |  |
| Portfolio |  |  |  |  |  |  |  | **x** | **x** | **x** | **x** | **x** |
| Assignments | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |
| MCQ | **x** | **x** | **x** | **x** | **x** | **x** | **x** |  |  |  |  | **x** |
| Examination | **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 8.2, 8.6 and 8.7, for this module cover key universal principles and concepts of separation science and therefore are core components of the Pharmaceutic R & D industry worldwide. Furthermore, learning outcomes 8.1, 8.3, 8.4 and 8.5, cover key universal techniques that used in the pharmaceutical R&D industry worldwide.

**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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