1. **Title of the module**

LABS501 Advanced Laboratory/Industry Skills

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

Centre for Higher and Degree Apprenticeships

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 course(s) of study to which the module contributes**

FdSc and BSc (Hons) in Applied Bioscience

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 knowledge and critical understanding of Health and Safety in the laboratory.

8.2 Demonstrate an understanding, including the use of, of complex laboratory/industry skills.

8.3 Demonstrate an ability to generate, evaluate, critically analyse and present practical work to a high standard.

8.4 Show a critical understanding of the role of the laboratory technician/process operator in industry.

8.5 Demonstrate knowledge and critical understanding of experimental design.

8.6 Understand how advanced scientific techniques fit within a scientific and technical environment (including industry).

8.7 Understand and apply root cause analysis in science.

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

9.1 Demonstrate high level of appropriate practical/technical skills.

9.2 Generate, analyse, evaluate and correctly interpret data.

9.3 Present and communicate data effectively and professionally.

9.4 Obtain and use information from a variety of peer reviewed published material/sources as part of self-directed learning.

9.5 Demonstrate time-management and organisational skills within the context of self-directed learning.

1. **A synopsis of the curriculum**

A in depth understanding of the following will be gained through laboratory sessions and lecture/seminars:

* Health and safety in the lab, relevant legislation and how to minimise risk in the workplace.
* Science skills such as GLP, keeping a laboratory notebook, making and recording measurements, identifying sources of error.
* Understanding how to use SI units and dilutions are used for reagent preparation (e.g. calculating efficient volumes/concentrations). Also how to use and calculate buffers and pH in experimental protocols.
* The use of a range of standard and advanced equipment and techniques used in the bioscience and chemistry sector (learners will have a choice of either chemical or bioscience techniques, depending on their field of work). Including how data produced via these techniques are analysed using statistical techniques.
* The generation and professional presentation of data (tables and graphs), together with writing laboratory reports.
* The application of Scientific Method.
* Root cause analysis and its application.

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

Barnard C. (2011) [Asking questions in biology a guide to hypothesis testing, experimental design and presentation in practical work and research projects](https://librarysearch.kent.ac.uk/client/en_GB/kent/search/results?qu=experimental+design&qf=FORMAT%09Format%09ER%09Ebooks&ir=Library&isd=true). Benjamin Cummings.

Bonamente, M. (2017) Statistics and analysis of scientific data. Springer

Katoch, R. (2011) Analytical techniques in biochemistry and molecular biology. Springer.

Dean, A. *et al.* (2017) Design and Analysis of Experiments. Springer.

Bryan, H., & MaHam (2016) Analytical Chemistry a chemist and laboratory technicians toolkit. Wiley.

Hill, R (2016) Laboratory safety for chemistry students. Wiley & Sons.

Dean, J.R (2011) Practical skills in chemistry. Prentice Hall.

1. **Learning and teaching methods**

Blended distance learning:

Contact hours: 120 hours

Private Study Time: 30 hours

Total Learning Time: 150 hours

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

Laboratory Report (2000 words) – full write up of 2 lab experiments (equally weighted)

Moodle Quiz 20%

Both assessments must be passed to pass the module. The pass mark for this module is 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 | 8.7 | 9.1 | 9.2 | 9.3 | 9.4 | 9.5 |
| **Learning/ teaching method** |  |  |  |  |  |  |  |  |  |  |  |  |
| **Private Study** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |
| Teaching | **x** | **x** | **x** | **x** | **x** | **x** | **x** |  | **x** | **x** |  |  |
| Work based experience |  |  |  |  |  |  |  | **x** | **x** | **x** | **x** | **x** |
| **Assessment method** |  |  |  |  |  |  |  |  |  |  |  |  |
| Laboratory Report |  | **x** | **x** |  | **x** |  | **x** | **x** | **x** | **x** | **x** | **x** |
| Moodle Quiz | **x** |  |  | **x** |  | **x** |  | **x** |  |  |  | **x** |

1. **Inclusive module design**

The division 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/or Canterbury campus

1. **Internationalisation**

Advanced Laboratory/Industry Skills is a core component of the Pharmaceutic R&D industry. With regards to the intended learning outcomes, in particular 8.5 and 8.6, the target learning outcomes within this module are applicable worldwide as part of the universal principles of Bioscience and chemical science, and reflect international aspects. Furthermore, the syllabus covers techniques that are widely used internationally as they are key in the pharmaceutical R&D industry.

**DIVISIONAL 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 delivery of revised version | Section revised | Impacts PLOs (Q6&7 cover sheet) |
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