1. **Title of the module**

LABS601 Research Methods

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

Digital and Lifelong Learning

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**

None

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

BSc (Hons) in Applied Bioscience

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 Show judgement in the selection and application of descriptive statistics.

8.2 Describe key legislation associated with scientific research.

8.3 Understand the proper use of controls and what is meant by ‘control’ group or condition.

8.4 Demonstrate systematic understanding of key aspects of random selection and assignment in experimental design.

8.5 Show judgement in the selection and application of non-parametric and parametric statistical tests.

8.6 Understand the difference between categorical and continuous variables.

8.7 Appraise scientific literature and understand it’s importance when designing an experiment.

8.8. Understand what is meant by within-subjects factors and between-subject factors and what repeated measures are.

8.9 Critically evaluate the different types of research designs and methodologies available in the field of science.

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

9.1 Develop and demonstrate an ability to analyse, evaluate and correctly interpret data.

9.2 Present and communicate data effectively and confidently.

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

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

9.5 Develop and demonstrate an ability to work and communicate effectively with others.

1. **A synopsis of the curriculum**

This module aims to enable learners to evaluate the range of research designs and methodologies relevant to scientific research and to critically appraise scientific literature. This includes coverage of associated research legislation, ethics, and the use of statistical techniques such as:

Descriptive statistics

Contingency tables, Chi-squared test, Fisher’s exact test

 T-tests

 Analysis of variance

 Correlation and regression

 Repeated measures

 Factorial and response surface designs

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

Spiegel, Murray (2014) Statistics. New York : McGraw-Hill Education.

Black, Beth (2012) [A to Z of critical thinking](https://librarysearch.kent.ac.uk/client/en_GB/kent/search/results?qu=critical+thinking&qf=FORMAT%09Format%09ER%09Ebooks&ir=Library&isd=true). Continuum.

D. Holmes, P. Moody and D. Dine (2010) [Research Methods for the Biosciences](https://librarysearch.kent.ac.uk/client/en_GB/kent/search/detailnonmodal/ent%3A%24002f%24002fSD_ILS%24002f0%24002fSD_ILS%3A1441791/one). Oxford University Press.

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

[Casella,](https://librarysearch.kent.ac.uk/client/en_GB/kent/search/results.displaypanel.displaycell.detail.mainpanel.fielddisplay.linktonewsearch?qu=Pitt%2C+Sarah+J.) G. (2008) Statistical design. Springer

1. **Learning and teaching methods**

Blended distance learning:

Contact Hours: 100 hours

Private Study Time: 50 hours

Total Learning Time: 150 hours

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

Assignment and exam

Weighting:

Essay Assignment (2,000 words) 40%

2 hr Exam 60%

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. ***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 | 8.8 | 8.9 | 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** | **x** |
| Teaching | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |  |  |  |  |  |
| Work based experience |  |  |  |  |  |  |  |  |  | **x** | **x** | **x** | **x** | **x** |
| **Assessment method** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Assignment  | **x** |  | **x** |  | **x** | **x** | **x** |  |  | **x** | **x** | **x** | **x** | **x** |
| Exam |  | **x** |  | **x** |  | **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 or Canterbury campus

1. **Internationalisation**

International vocation is an important part of Applied Bioscience and Chemistry. The intended learning outcomes 8.3, and 8.4, for this module cover key universal principles and concepts needed for experimental design, and therefore are core components of any scientific research, worldwide. Furthermore, all other learning outcomes cover key universal statistical techniques that are applicable to scientific research, worldwide. The syllabus also covers research legislation and regulations, which are considered from an international perspective.

**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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